SCHEDULES
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP
SEPTEMBER 03, 2024

SCHEDULE 1
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

COPY OF SUBMISSIONS

The Government of Saskatchewan passed *The Saskatchewan First Act* on May 23, 2023. The Act came into force September 15, 2023. It established the independent Economic Impact Assessment Tribunal to conduct economic impact assessments of Government of Canada initiatives that may cause harm to Saskatchewan projects, operations, activities, industries, businesses, or residents.

The Members of the Tribunal are:

- Michael W. Milani, K.C. Chairperson
- Dr. Janice MacKinnon, Vice-Chairperson
- Kenneth From
- Dr. Stuart Smyth
- Estella Petersen

The Tribunal can be contacted at:

Ken Dueck, Executive Director
Economic Impact Assessment Tribunal Secretariat
1100 – 1874 Scarth Street
Regina, SK S4P 4B3
Telephone: 306-787-3482
E-mail: eiat@gov.sk.ca

Table of Contents

7 Energy LTD 4
Canadian Association of Energy Contractors 5
Canada Association of Petroleum Producers 8
Cardinal Energy LTD 40
Enserva 43
Environment and Climate Change Canada 47
Explores and Producers Association of Canada 49
Harvard Resources Inc 65
Pemoco 67
Saskatchewan association of Rural Municiplites 68
Saskatchewan Chamber of Commerce 70
Secure Energy 73
SteelReel Infrastructure Corp 75
Triland Energy Inc 77
Whitecap Resources Inc 80
Woodland Development Corp 84

Economic Impact Assessment Tribunal Submission

Given the size of our Company and current operations, the implementation of Methane 75 and the Cap overall will have very little impact on how 7Energy Ltd conducts its operations. Mandating a 75% reduction from current levels within a short timeframe may not only be technically unfeasible but also financially burdensome especially considering the additional costs associated with upgrading equipment and processes to comply with such stringent regulations.

Instead of imposing blanket regulations that could cripple Saskatchewan's economy, a more balanced approach is needed. This could involve continued investment in research and development of cleaner technologies, incentivizing voluntary emissions reductions through targeted policies, and supporting industries in transitioning towards more sustainable practices over a realistic timeframe.

Thank you,

7Energy LTD

Written Submission to the Saskatchewan Economic Impact Assessment Tribunal's Study on the Federal Oil and Gas Emissions Cap

By: Mark A. Scholz, President & CEO
Canadian Association of Energy Contractors

July 18, 2024

Regulatory Issues

The Canadian Association of Energy Contractors ("CAOEC") is opposed to the draft regulatory framework of a federal oil and gas cap ("Cap") on greenhouse gas emissions ("GHG") as announced by Environment and Climate Change Canada in December 2023. The implementation of this restrictive and unnecessary regulation will:

- Impede carbon abatement technological advancements and innovation in the drilling rig and service rig sector.
- Hinder the sector's decarbonization progress in the pursuit of diverse energy and resource streams, including geothermal, lithium, helium, and potash.

The energy services industry, made up of companies based across the western provinces and employing thousands of people in rural, remote, and Indigenous communities, has always been at the very centre of innovation, including when it comes to GHG emissions reduction and carbon management. Our industry already has proven carbon abatement technologies, such as high-line power, battery energy storage systems, and alternative fuel sources to power our equipment and accelerate Canada's path to emissions reduction. This will allow companies to move technology off diesel to low-to-zero-emission battery alternatives as viable in the areas in which we operate.

However, the federal government has consistently delivered our industry regulatory sticks rather than fiscal carrots in our journey to reduce emissions. The current cost of deploying some of these technologies is over \$1,000/tonne CO2eq. At present, there are no appropriate financial tools available to accelerate the long-term deployment of proven carbon abatement technologies waiting to be utilized across the sector. But with multilateral governmental support, the deployment of these technologies on our equipment could reduce our sector's GHG emissions by as much as 85 – 95 per cent.

Over the last few years, CAOEC has actively engaged with the federal government on the inclusion of the drilling rig and service rig sector in existing governmental resources and tools, such as the Clean Technology Manufacturing Investment Tax Credit. However, the federal government has yet to deliver any meaningful progress to date, instead penalizing our companies and their people with policies like the Cap. We believe we are also being punished because the majority of our work supports the fossil fuel industry. Our people are ready to do the work needed to position Canada as a world leader in carbon efficiency; however, access to existing fiscal tools and resources is vital to advance decarbonization goals in the oil and gas sector at the pace desired.

Our energy workers are also on the frontline of Canada's energy transformation. The sub-surface extraction of Canada's diverse energy and critical mineral resources, such as lithium for EV batteries, helium for semiconductors, geothermal heat to generate electricity, potash, or storage for carbon dioxide or hydrogen, will always require energy services and contractors. Our business model enables us to seamlessly utilize the same equipment across exploration projects without retraining our people on the ground or switching out expensive equipment. Thus, a lack of support for technologies that decarbonize the extraction of oil and gas would also mean a lack of support for technologies that decarbonize the extraction of critical mineral resources. The Cap will hinder Canada's ability to attract capital, leading to fewer jobs for Canadian energy workers. Ultimately, this restrictive regulation will slow the sector's decarbonization progress in the pursuit of diverse energy streams. The success of an inclusive and thriving energy future depends heavily on a healthy and innovative drilling rig and service rig sector.

The future of Canada's energy industry runs through our people; the energy services sector is at the very centre of a rapidly growing energy world. Our members and their people already possess the skillset necessary to be the industry's frontline for emissions reduction. However, emissions reduction should be prioritized through responsible, informed policy. Our sector's ability to streamline decarbonization efforts will require fiscal carrots rather than the current onslaught of regulatory sticks. CAOEC will continue to come to the table as a constructive partner on the development of financial tools and resources that are inclusive of drilling rig and service rig companies. For further information on the multilateral coordination required to push the energy services industry forward, please find attached the following documents as submitted to the federal government:

- Written Submission on the Consultation on Clean Technology Manufacturing Tax Credit
- Supplementary Note to the Submission for the Consultation on the Clean Technology Manufacturing Investment Tax Credit

About CAOEC

CAOEC represents 95 drilling rig and service rig member companies (nearly 100% of the industry) on the frontlines of energy security and transition. The membership operates a fleet of 460 land drilling rigs and 748 service rigs in Saskatchewan, northeast British Columbia, Alberta, southwest Manitoba, and offshore drilling rigs operating off the coast of Newfoundland.

CAOEC's members are varied and diverse. Many of our members are large, small, and medium-sized enterprises that have been leaders in creating opportunities for young people, Indigenous communities, and middle-class workers to access the energy we need in Canada and around the world.

For decades, our membership has included Indigenous representation. From Indigenous-owned companies such as Pimee Well Servicing, Homeland Well Servicing, Onion Lake Cree Nation Well Servicing, and Indigena Drilling, to business partnership ventures, ownership stakes, and Indigenous training programs, CAOEC members create meaningful work in remote communities and exemplify an inclusive transformation in the energy services sector.

Economic Impact Assessment Tribunal Secretariat

Ken Dueck, Executive Director
Saskatchewan Ministry of Justice and Attorney General
Secretariat Office
1100 – 1874 Scarth Street, Regina, SK S4P 4B3
Via email ken.dueck3@gov.sk.ca

July 5, 2024

Re: Tribunal's Assessment of the Proposed Federal Methane Regulations and Emissions Cap

Dear Mr. Dueck:

The Canadian Association of Petroleum Producers (CAPP) is a non-partisan, research-based industry association that advocates on behalf of our member companies, large and small, that explore for, develop, and produce oil and natural gas throughout Canada. Our associate members provide a wide range of services that support the upstream industry.

CAPP's members produce nearly three quarters of Canada's annual oil and natural gas production and provide approximately 450,000 direct and indirect jobs in nearly all regions of Canada. According to the most recently published data, the industry contributes over $70 billion to Canada's GDP, as well as $45 billion in taxes and royalties to governments across the country. CAPP is a solution-oriented partner and works with all levels of government to ensure a thriving Canadian oil and natural gas industry.

We strive to meet the need for safe, reliable, affordable, and responsibly produced energy, for Canada and the world. We are proud to amplify industry efforts to reduce GHG emissions from oil and gas production and support Indigenous participation and prosperity.

In this regard, CAPP and our members appreciate the Tribunal's invitation to provide feedback on the potential impacts of the federal draft *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)* and the proposed emissions cap.

2100, 350 – 7 Avenue S.W.
Calgary, AB
Canada T2P 3N9
Tel 403-267-1100

1820, 275 Slater Street
Ottawa, ON
Canada K1P 5H9
Tel 613-288-2126

1004, 235 Water Street
St. John's, NL
Canada A1C 1B6
Tel 709-724-4200

201, 1114 Langley St.
Victoria, BC
Canada V8W 1W1
Tel 778-265-3819

capp.ca

Overview

Proposed Emissions Cap

CAPP is not supportive of the proposed regulatory framework cap-and-trade approach to cap emissions on the upstream oil and natural gas and emerging liquified natural gas (LNG) industries as this option will have negative implications for our sector and the economy. CAPP has signalled this position to the federal government on multiple occasions. Under the cap-and-trade option, some producers will be forced to cut production to achieve the overly aggressive compliance obligation.

Methane

As written, the draft amendments to the *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)* do not represent a workable path to a 75% reduction by 2030. The regulations require further revisions to align its requirements with what can be reasonably achieved with commercial technologies.

Economic Implications

CAPP commissioned an economic impact assessment report (the report) included in Appendix 1. The report completed by S&P Global Commodity Insights was intended to better understand the potential economic implications of different production scenarios, including where a fixed emissions cap is imposed upon the sector. The report only focused on the impact on conventional production and did not include oil sands production.

The report explored three alternative production scenarios under parameters requested by CAPP for the conventional oil and natural gas sector to 2035:

- The **Reference Case** forecasts conventional oil and natural gas production under current policy conditions.
- The **Stress Case** forecasts production under a stringent 40% emissions cap mandated for 2030.
- The **High Case** forecasts production with the assumption of additional investment into export and production infrastructure.

The Stress Case included increased additive measures on existing facilities to reflect expected actions on methane in conjunction with a stringent emissions cap. The result in Saskatchewan, was an overall reduction of investment in production by $8 billion from 2024 to 2035. Significant funds were required to be put towards methane abatement and these funds were reallocated from production investment.

The report suggests significant implications to Canada with a resulting 51,000 fewer jobs and a $247 billion reduction in GDP over the period. As requested by the Tribunal and for ease of reference, CAPP has included our past submission on the proposed emissions cap in Appendix 2.

In summary, CAPP requests that the Government of Canada not proceed with the unnecessary proposed cap-and-trade emissions cap on the oil and natural gas sector. We also contend that the draft federal methane regulations do not represent a workable path to a 75% reduction by 2030.

Should you have any questions, please contact sian.pascoe@capp.ca or patrick.mcdonald@capp.ca.

Sincerely,

Richard Wong, Vice President, Regulatory & Operations

Attachments

Attachment 1

Economic Impact Assessment of Canadian Conventional Oil and Gas

Energy Transition Consulting

Economic and Country Risk Consulting

May 2024

S&P Global
Commodity Insights

Significant investment in the conventional oil & gas sector is expected between 2024 and 2035 to meet oil & gas demand and decarbonization efforts & policies

Key takeaways

Conventional upstream activity, estimated at **$519 billion** between 2024 and 2035, has a Canadian GDP contribution[1] of **$1.2** Trillion, or **2.4x** every dollar spent

- S&P Global forecasts conventional oil & gas **production growth of 0.8%** YoY from 5.4 Mboe/d in 2023 to 5.9 Mboe/d in 2035 – under the Reference Case, absolute **emissions fall by 8%**[4] between 2024 and 2035
- Spend in production and infrastructure CAPEX and OPEX between 2024 and 2035 could total **$519 billion**
- This investment provides **$627 billion** of spend-based GDP contribution[1], **$588 billion** of estimated oil & gas export sales and **$102 billion** of estimated royalties – and supports **347 thousand** jobs annually[5]

8% higher production by 2035, under a high case, leads to an additional **10%** growth in spend and **9%** growth in GDP

- Canada is strategically positioned to deliver LNG to East Asian countries (largest demand-growth region) as shipping costs and delivery times are lower relative to other relevant exporters
- The Montney play holds 300 TCF of natural gas resources beyond producing assets, that are economic at US$2.5/MMBtu – this is equivalent to ~20 additional LNG trains[3]
- Through debottlenecking, existing gas pipelines and LNG export capacity, Canada's production could be **8% higher** than the Reference case and drive an additional **10% growth in spend** and **9%**, or **$105 billion**, of sales & export-based GDP (and added royalty revenue)

A production cut driven by a **stringent 40%** emission cap[2] could cause **$75 billion** lower upstream spend and **$247 billion** lower GDP contribution[1] (vs. Reference Case)

- With a stringent 40% emissions cap by 2030 relative to 2021 in oil & gas, S&P Global estimates that total conventional production could be **17% lower than Reference Case** between 2024 and 2035
- This leads to a 14% reduction of investments in conventional oil & gas through production shutdown of higher OPEX wells, lesser drilling activity in the most expensive areas and additional decarbonization investments (such as CCS and additive methane reductions on existing facilities)
- The production cuts impact spend-driven GDP (- $92 billion) and oil & gas exports (- $155 billion)

1. GDP contribution includes both spend-driven GDP (supply chain) and Export sales for non-domestic oil & gas sales (transported by pipeline to USA or liquefaction terminals)
2. Emissions cap of 40% reduction by 2030 relative to 2021, that gradually increase to reach net zero by 2050; Resulting in 55% reduction relative to 2021 by 2035 for the oil and gas sector as a whole (including oil sands).
3. Estimated considering if all 157 Tcf (discounting 143 Tcf expected to be produced in the Reference case until 2050) were allocated in 7 Mpta trains (using LNG Canada as a reference) requiring ~1 Bcf/d of natural gas for 20 years of operations.
4: In the Reference case limited spend is allocated to decarbonization – under CAPP guidance, SPGCI excluded decarbonization spend in electrification, CCS and additive methane reductions on existing facilities from Reference Case as proposed policies not final.
5. Direct, indirect and induced jobs

Source: S&P Global Commodity Insights

CAPP engaged S&P Global to quantify the impact of different conventional oil & gas production scenarios on the Canadian Economy through supply chain and export sales

Context

- The oil & gas industry is a key contributor to Canada's GDP, labor market, and exports
- The sector is subject to increasing pressures to decarbonize its operations
- This analysis did not assume financial impact associated with oil & gas producers' emissions profiles

Objective

- Create three production scenarios and evaluate impact on related investment spend by producers
  - These scenarios **exclude** any oil sands investments or economic impact evaluation
  - GHG emissions are derived from Canada's National Inventory Report data (NIR)
  - Estimate the economic impact of the various production scenarios on the Canadian Economy (GDP contribution defined as supply chain induced and based on oil & gas export revenue)[1]

Scenarios

1 Reference case

- Conventional Oil & Gas production to 2035 based on S&P Global base case production forecast
- Conventional oil & gas production reaches **5.9 Mboe/d** by 2035 from **5.4** Mboe/d in 2023

2 High case[2]

- Conventional Oil & Gas Production is **8%** higher than Reference case by 2035
- Incremental gas production is exported from additional LNG terminals

3 Stress case[2]

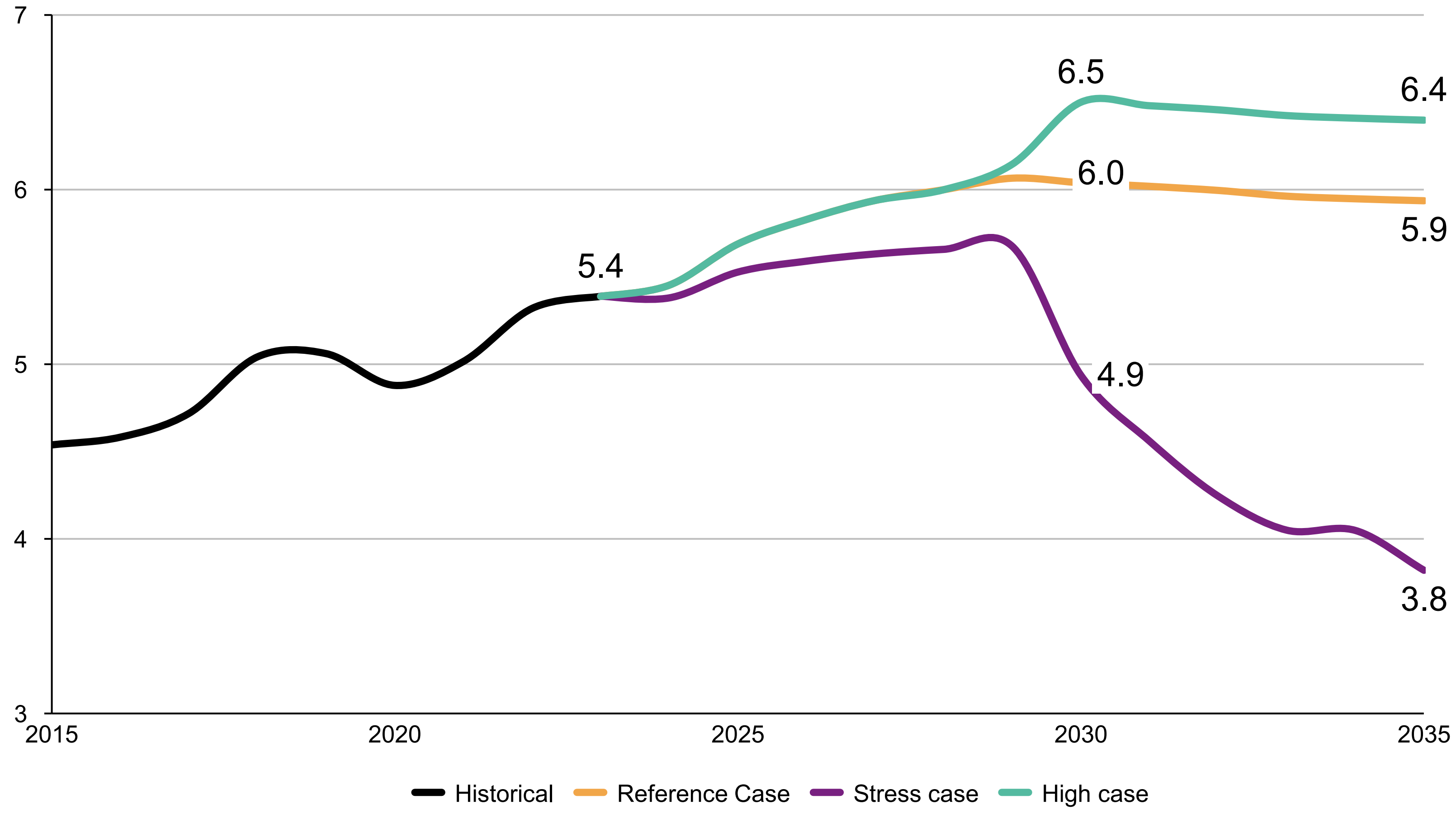
- Mandated emissions reduction of **40%[3]** in 2030 compared to 2021, gradually increasing to 55% by 2035[4]
- Production cuts are required to meet a stringent emission cap

1. Economic Impact analysis in this report is limited to supply chain and export contribution – economic impact assessment of oil & gas emissions and other environmental impact has not been completed as part of this analysis
2. Hypothetical CAPP defined scenarios – Stress Case assumptions include assumption that every dollar spent on decarbonization efforts is a dollar lost on oil & gas production effort, and that shareholder returns are stable
Emissions cap is for the entire upstream sector, including oil sands
3. Gradual increase in emission reduction target so that sector emissions are net zero by 2050
Source: S&P Global Commodity Insights, NIR (data extracted in March 2024)

Three conventional oil & gas production scenarios were analyzed, leveraging the S&P Global Base Case production scenario for reference case

Conventional oil & gas production scenarios

Million boe/day



High Case

- Additional natural gas production from Montney for LNG exports
- New wells have lower emission intensity due to efficiency increase and best operational practices
- Optimization and expansion of existing gas pipelines

Reference Case

- Conventional production grows[1] until 2027, remaining stable afterwards at ~6Mboe/d
- Growth in natural gas and light oil drive ramp up in production between now and 2030

Stress Case

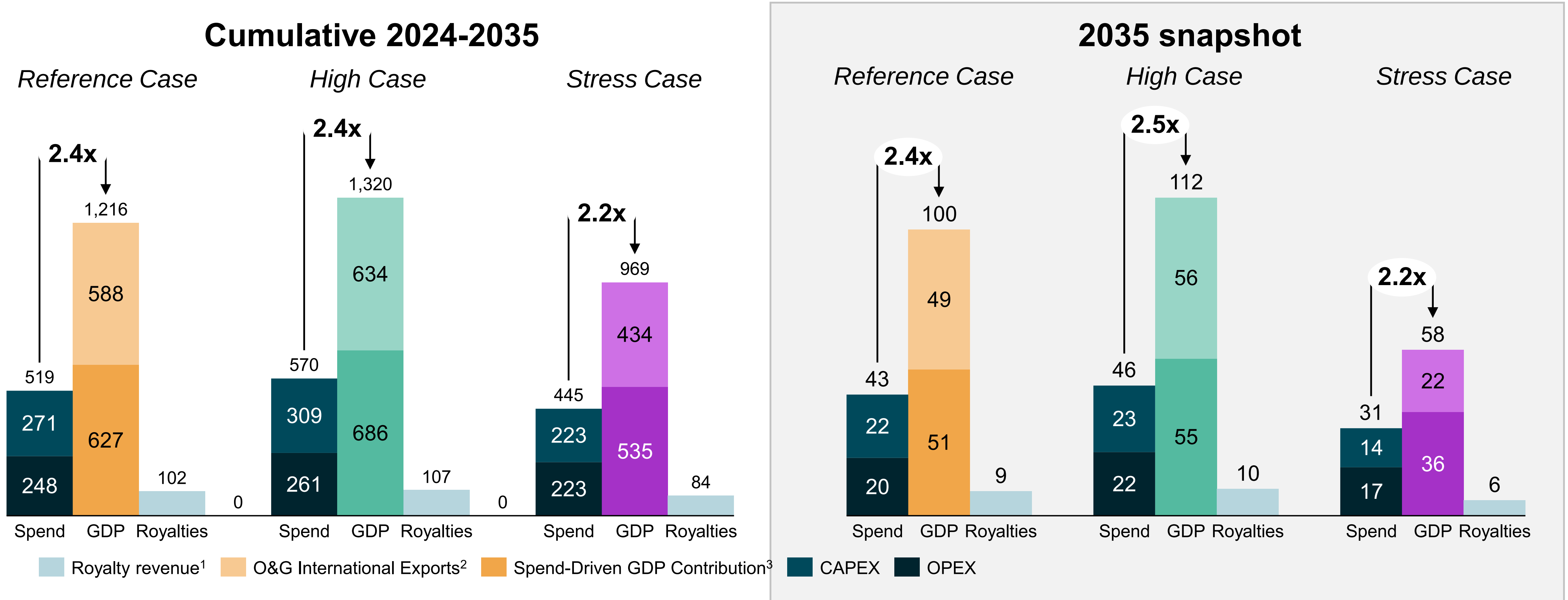
- Emissions reduction mandated for 2030
- Assumes limited electrification and CCS can be implemented for the sector before 2035
- Growth projects are idled before cap is enforced
- Production cuts are required to meet emissions cap in 2030 and beyond to reach net zero by 2050

Note: does not include oil sands.
Note: CAPP informed High and Stress Case production outlook were modeled considering as main assumption a 40% emission reduction by 2030 from 2021. As the cap is for the sector as a whole, oil sands production and emissions reductions were used as input for the conventional oil and gas estimates.
1. Driven by increase in natural gas production for increased exports (mostly LNG), increase in diluent demand and the completion of the TMX oil pipeline, allowing increased oil exports.
Source: S&P Global Commodity Insights

Investment spend in the conventional O&G sectors has a 2.4x multiplier effect on GDP, with a lower production scenario reducing total GDP impact by 20% vs. Ref. case over 2024-35

GDP impact by scenario

Real 2022 billion CAD

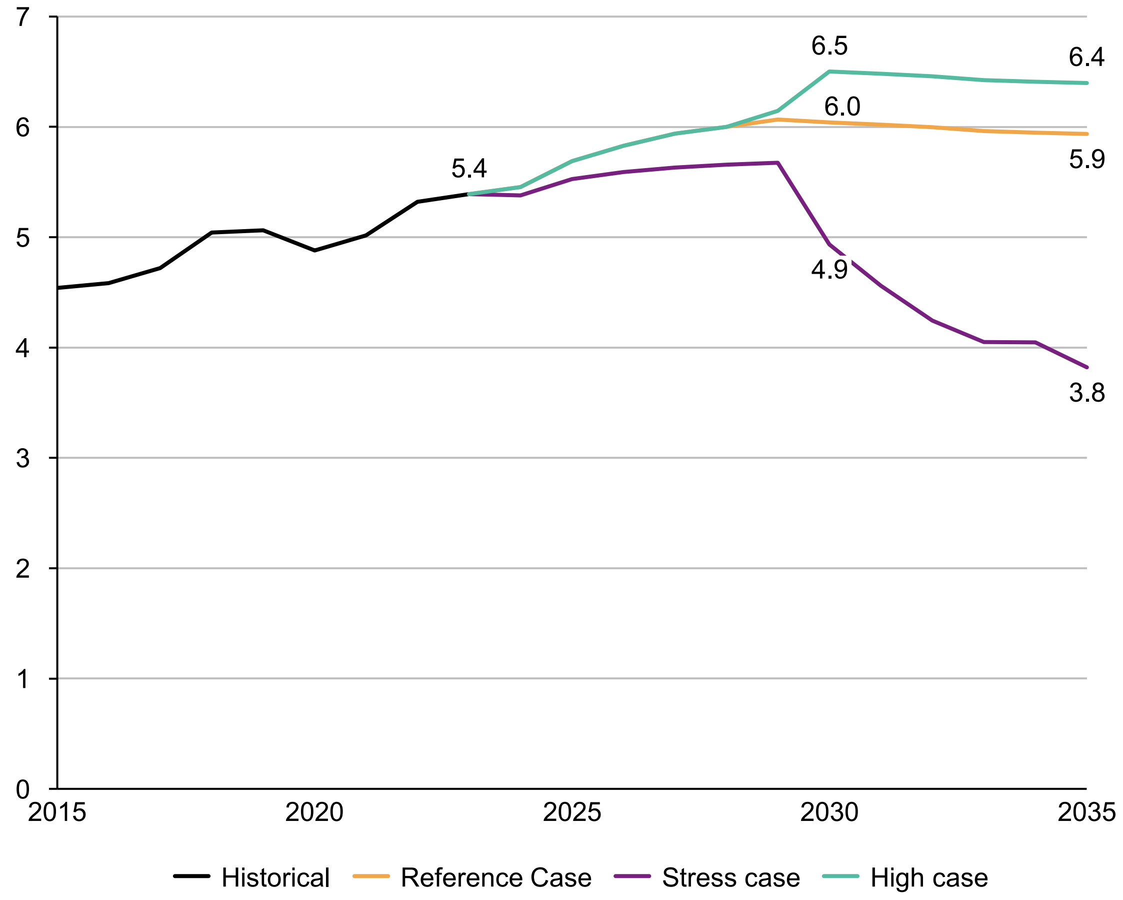


1: Royalty Revenue Averages Used: 6.2% for Heavy Oil, 12.17% for Offshore Oil, 9% for Light Oil, 8% for Natural Gas (based on historical royalty averages, aggregated by commodity); Includes royalties for oil and gas directed to domestic consumption;
2:Export Revenue: WCS price used for oil export (assumed 100% pipeline), LNG export price assumed for natural gas exported via LNG Canada & Woodfibre, and AECO for pipeline gas exports to the US **– excludes Royalty**
The bulk of export revenues received by the O&G companies must be used to cover royalty and tax payments, opex and derive profits. While some wage effects could recycle into the broader economy, quantifying these effects is complicated by the extensive use of contractors (who are paid via opex)
3: GDP contribution driven by upstream spend (production, decarbonization and infrastructure) within Canada
Economic benefits from domestic production & sales (considered an input and intermediate product in refining & petrochemicals), could provide additional indirect benefits to the Canadian Economy
Source: S&P Global Commodity Insights

Key projections summary – the Stress Case scenario with reduction in conventional oil & gas production leads to 14% lower production investments vs. Reference Case

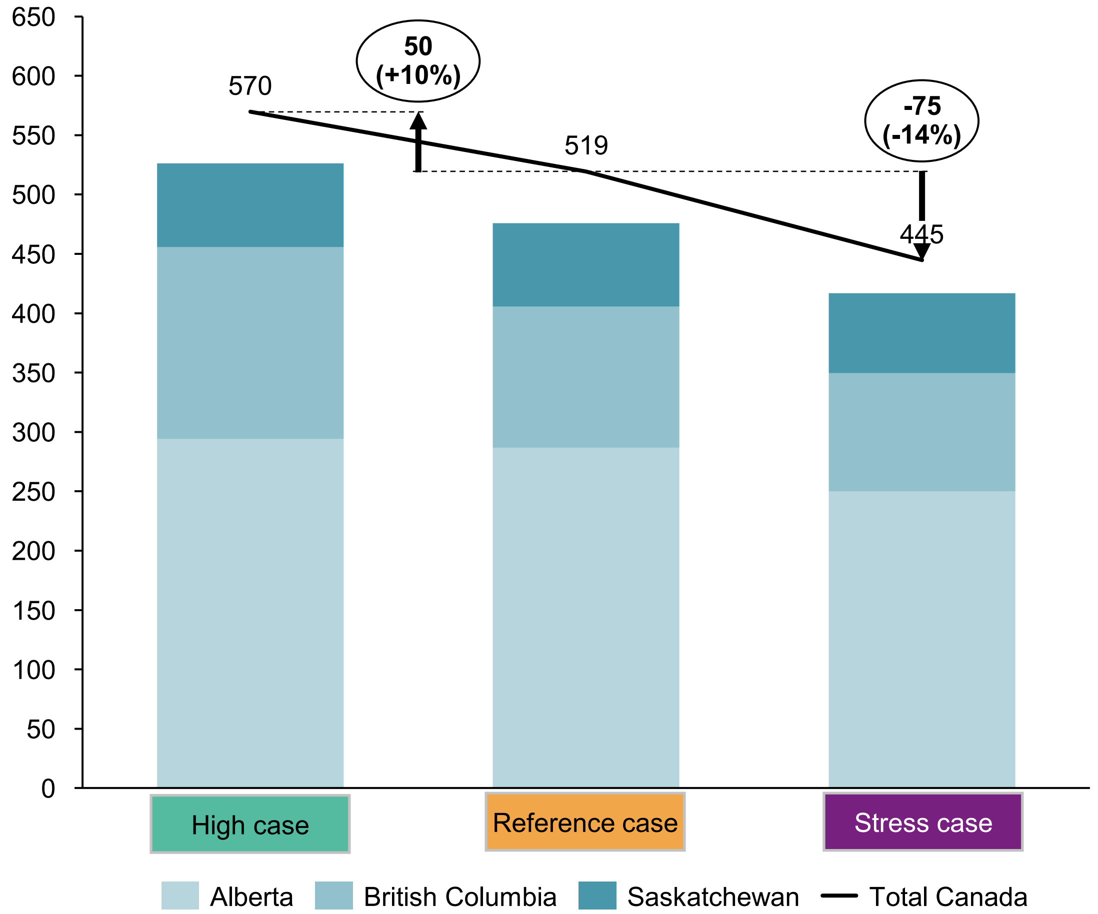
Conventional O&G production[1]

Million boe/day



Total cumulative investments[1]

Real 2022 Billion CAD



1. Excludes oil sands.

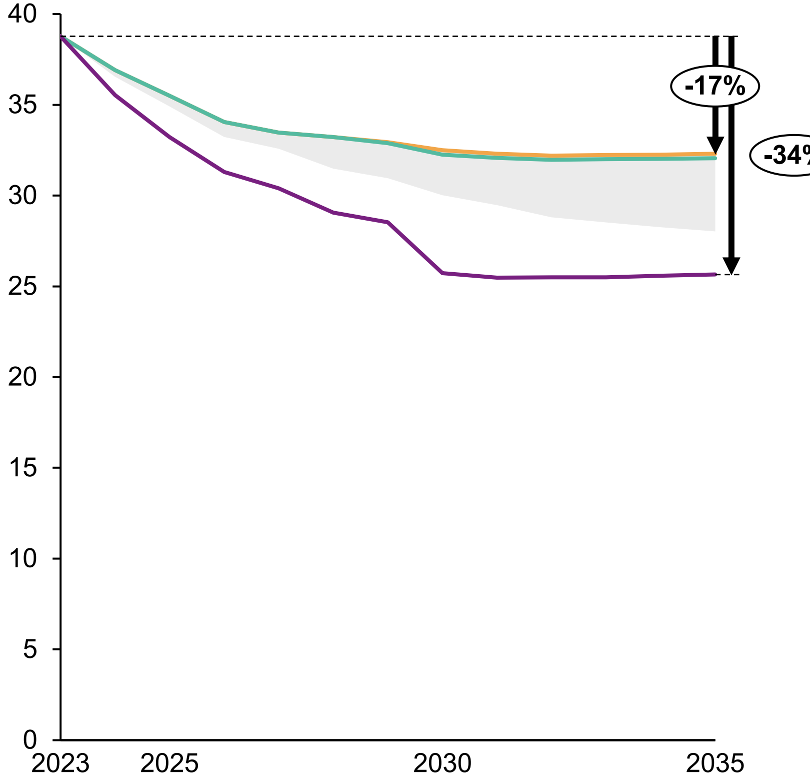
Note: CAPP informed High and Stress Case production outlook were modeled considering as main assumption a 40% emission reduction by 2030 from 2021. As the cap is for the sector as a whole, oil sands production and emissions reductions were used as input for the conventional oil and gas estimates.

Source: S&P Global, Historical emissions from NIR

The sector's GHG emission intensity is expected to decline by at minimum 17% from its 2023 levels under all production scenarios, leading to lower absolute emissions vs. 2023

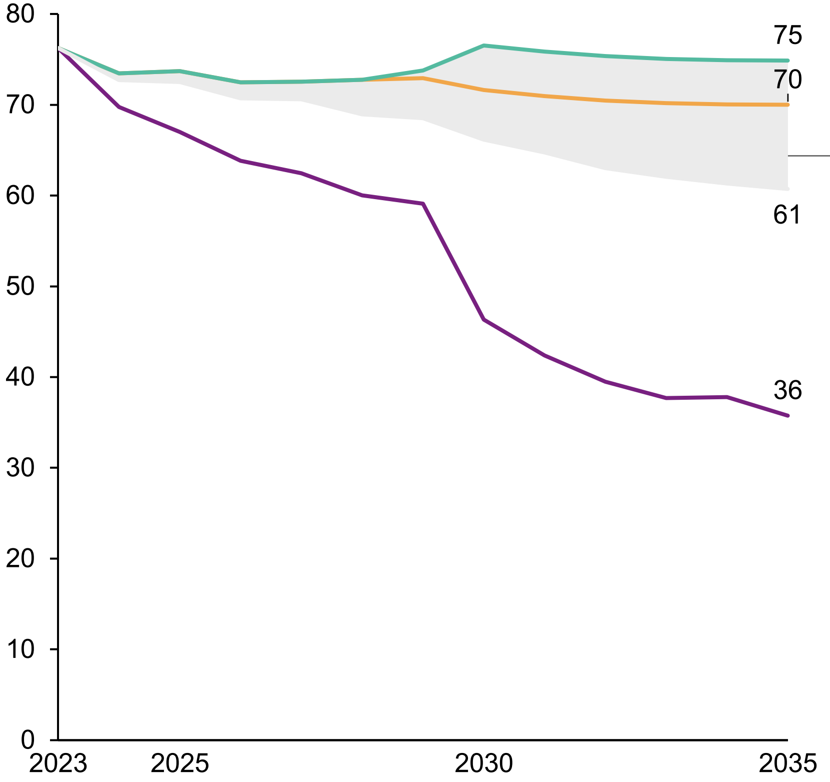
Conventional O&G[1] emission intensity[2]

$kgCO_2e/boe$



Conventional O&G[1] absolute emissions

Million metric tonnes of CO_2e



Reference Case — High case — Stress case

- The gray range reflects potential emission reduction pathways for the reference case and the high case
- The Reference Case includes assumptions that more aggressive emission abatement technologies are limited to new wells, and only includes partial methane abatement measures
- The lower bound in emissions in the reference and the high case could be attained through the application of additional decarbonization measures, such as 1) more methane abatement measures, 2) CCS and 3) electrification technologies[3]

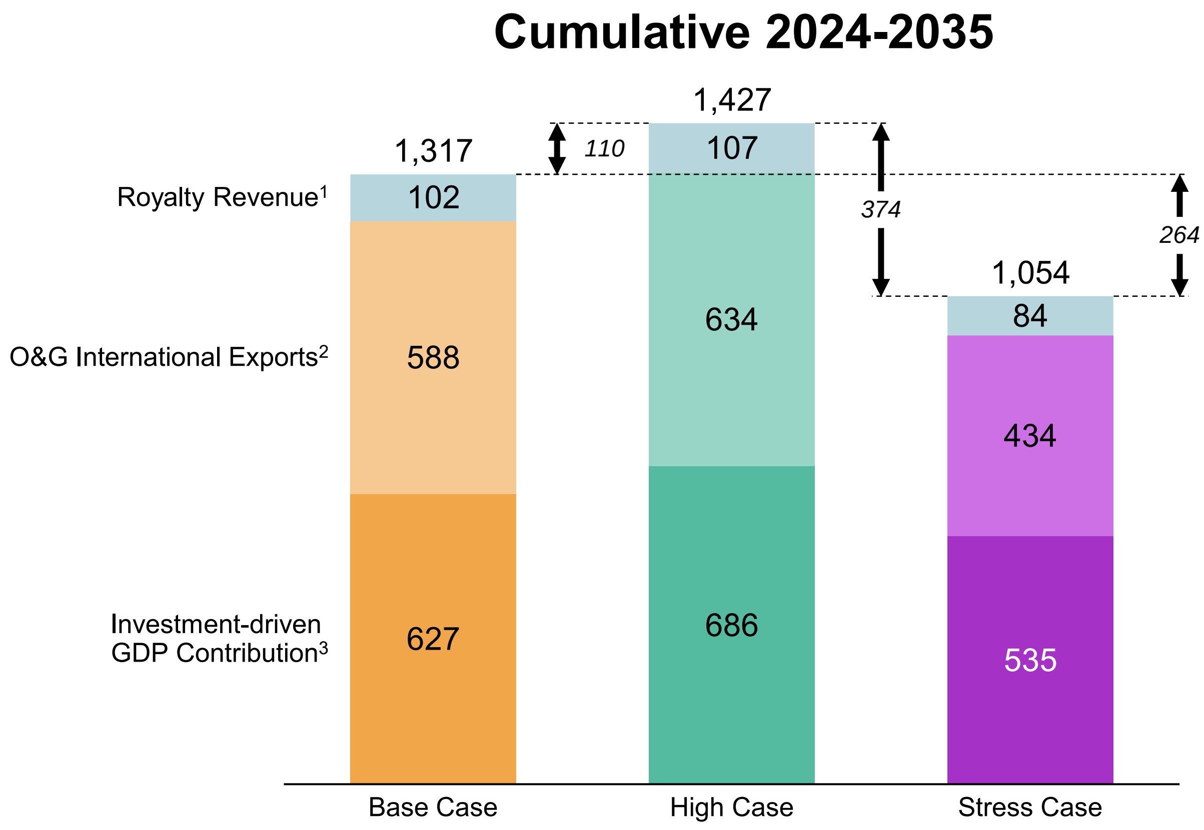
1. Does not include oil sands.
2. Emission intensity for 2021 was calculated using NIR conventional oil and gas (excludes oil sands) reported emissions and S&P Global's reported production. Emissions intensities from 2022 onwards includes implemented abatement measures and efficiency improvements expected for each scenario
3. The lower limit of the range considers 2.5 $MmtCO_2e$ CCS implementation in Alberta ramping up between 2028 and 2030, 100% implementation of general methane abatement measures (LDAR, blowdown capture, replace pumps, installation of flares, vapor recovery units (VRUs), etc.) in new wells and electrification in AB, BC and SK; excludes additive methane reductions on existing facilities. Reference case considers 80% implementation of general methane abatement measures in new wells, no CCS and no electrification.

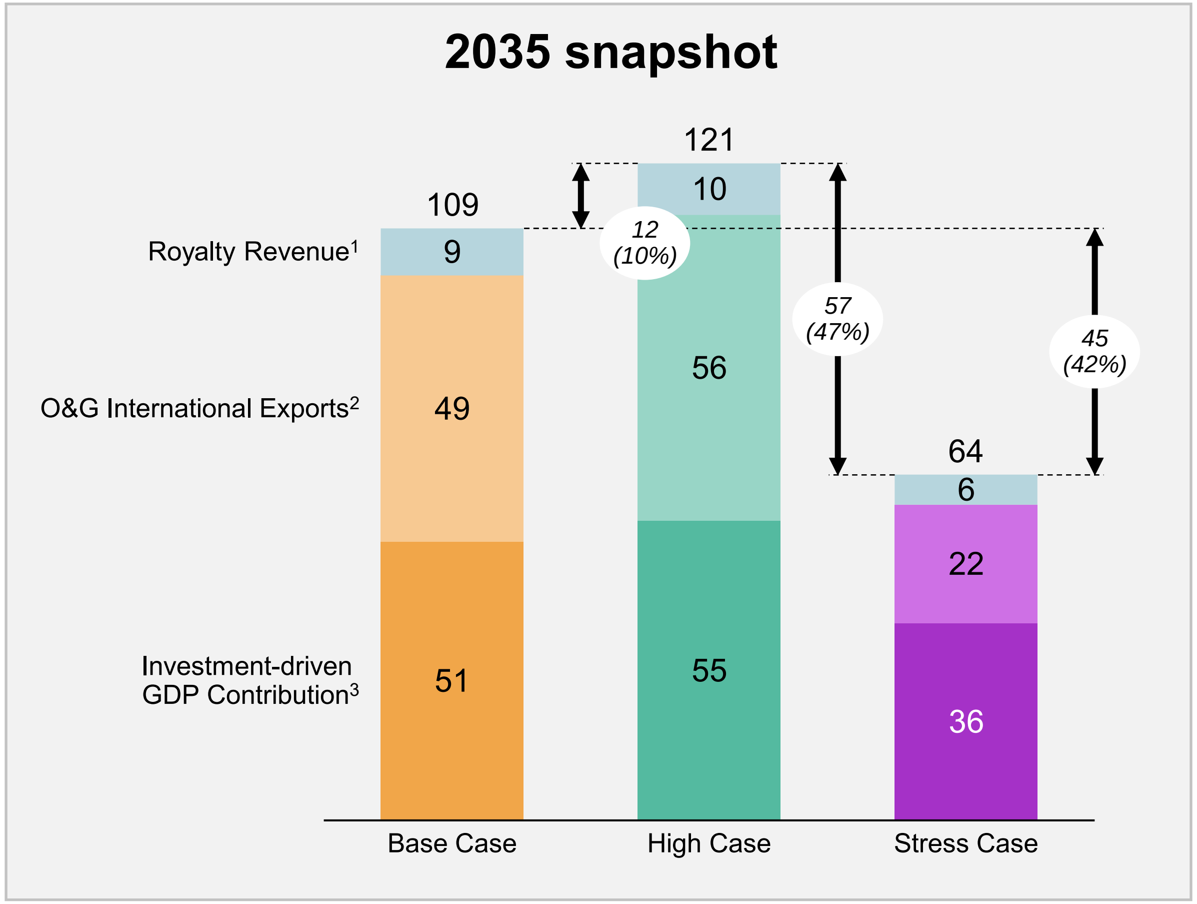
Sources: S&P Global Commodity Insights and NIR (data extracted in March 2024)

The different production scenarios can widen the GDP impact by up to $374 billion over 12 years, with a much more visible impact post 2030 (after the cap takes effect)

Aggregated Economic contribution by scenario

Real 2022 billion CAD





1. Royalty Revenue Averages Used: 6.2% for Heavy Oil, 12.17% for Offshore Oil, 9% for Light Oil, 8% for Natural Gas (based on historical royalty averages, aggregated by commodity); Includes royalties for oil and gas directed to domestic consumption;
2. Export Revenue: WCS price used for oil export (assumed 100% pipeline), LNG export price assumed for natural gas exported via LNG Canada & Woodfibre, and AECO for pipeline gas exports to the US **– excludes Royalty**
3. GDP contribution driven by upstream spend (production, decarbonization and infrastructure) within Canada

Source: S&P Global Commodity Insights

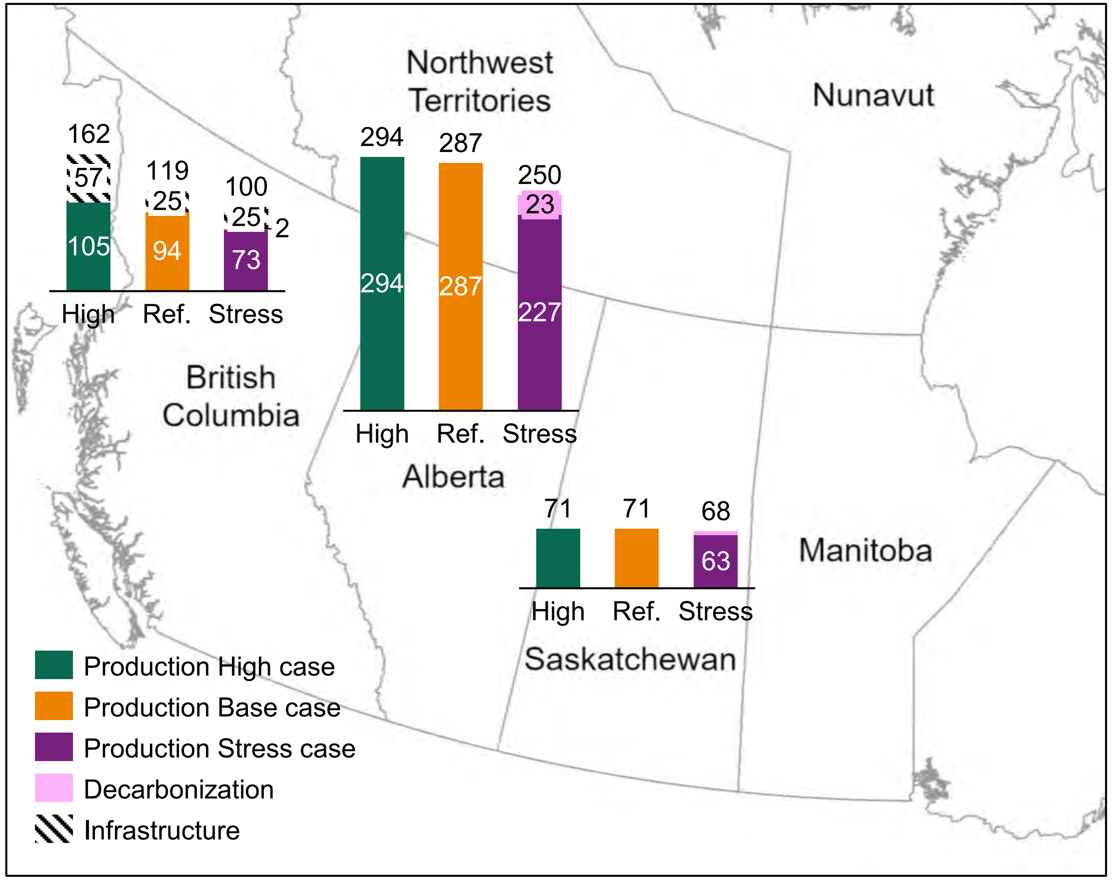
Direct conventional operation and infrastructure investments between 2024 and 2035 have GDP contribution of $1.2 Trillion over the period, with 347+ thousand jobs supported annually

Key takeaways	Reference Case		High Case		Stress Case	
Production (2035)	Conventional oil and gas (excluding oil sands)	**5.9** Mboe/d	Additional LNG exports and associated liquids production	**+ 0.5** Mboe/d	Mandated emissions reduction leads to production cuts	**- 2.1** Mboe/d
Upstream Investments[1]	Production and infrastructure related investments	**519** Billion CAD	Increased spend in production, decarbonization and infrastructure	**+ 50** Billion CAD	**14%** drop in investment spend[4]	**- 75** Billion CAD
Spend- based GDP contribution[1]	GDP creation **~20%** over direct production spend	**627** Billion CAD	$9 Billion of net additional GDP contribution beyond the $50 billion spend	**+ 59** Billion CAD	GDP decrease by **~15%** compared to Reference case	**- 92** Billion CAD
Oil & gas exports[1,2]	Crude oil, pipeline gas and LNG exports	**588** Billion CAD	Additional LNG exports via Pacific	**+ 46** Billion CAD	Drop in gas & crude oil export sales	**- 155** Billion CAD
Employment[3]	Every billion CAD of direct CAPEX and OPEX **will support** over 8,000 jobs	**347** thousand jobs	**~11%** additional annual jobs supported	**+ 36** thousand jobs	**~15%** fewer jobs supported annually	**- 51** thousand jobs

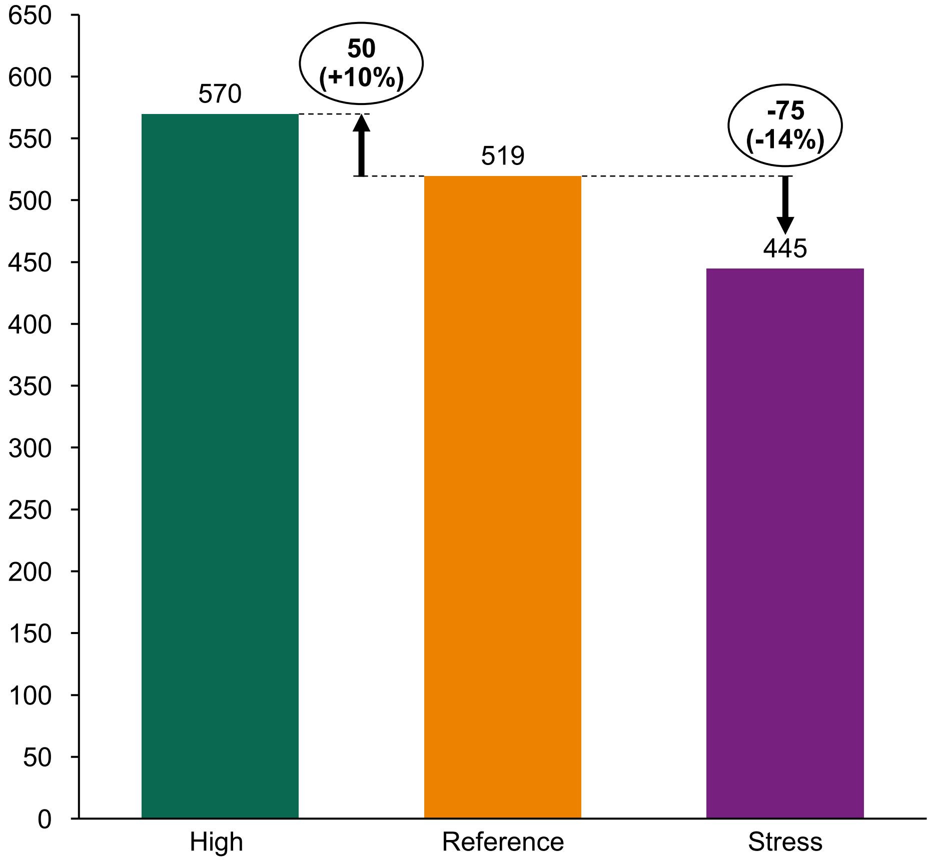
Notes: Does not include Oil Sands
1. Direct, indirect and induced cumulative contribution between 2024 and 2035 (Production investments include some levels of spend in decarbonizing operations)
2. Estimated crude oil, gas and LNG exports vs. commodity price at year n,(detailed calculations in Appendix) - Excludes government royalties on exports
3. Annual averages between 2024 and 2035; GDP and employment are direct + indirect + induced results
4. Assumes capital is fixed and reallocated.
Source: NIR (data extracted in March 2024), S&P Global Commodity Insights

Cumulative spend under the Reference Case totals $519 billion, with the High Case scenario requiring an additional $50 billion spend in infrastructure and production in Western Provinces

Total 2024-2035 cumulative investment for selected provinces[2]
Real 2022 Billion CAD

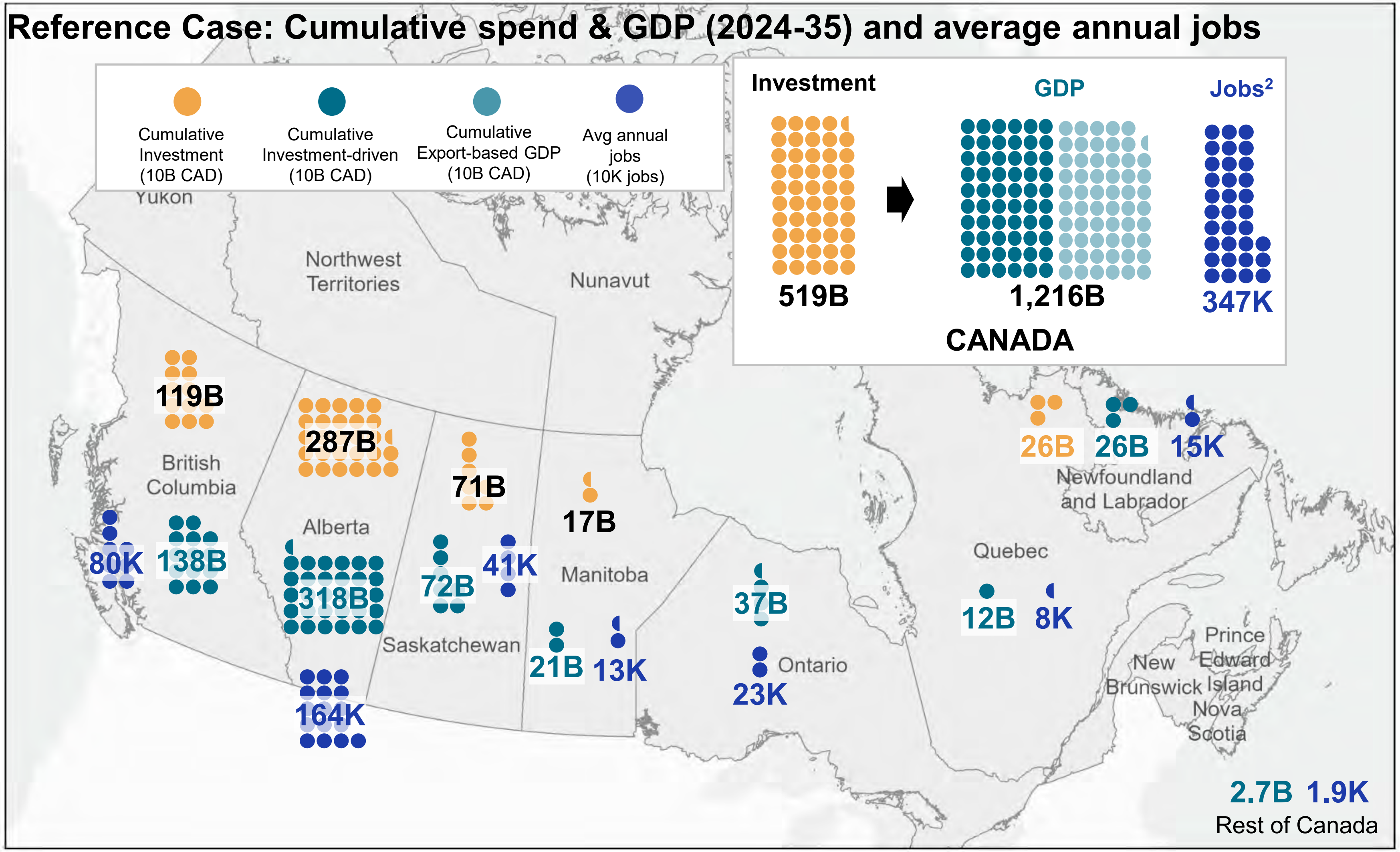


Total investments¹
Real 2022 Billion CAD



Notes: Total investments in the stress case relative to Reference case are attenuated given the additional decarbonization investments.
1. Cumulative between 2024 and 2035; Includes investments from all provinces.
2. Excludes investments from Ontario, Manitoba and Newfoundland.
Source: S&P Global Commodity Insights

The net impact of conventional investments on GDP and jobs goes beyond the oil & gas producing Provinces, with 8% spend-based GDP and 9% jobs supported out of Province



- Every **1 billion CAD** of investment[1] yields **1.2 billion CAD** of investment-driven contribution to Canadian GDP
- On an annual basis, every **1 billion CAD** of investment supports **8,000 jobs[2]** across Canada
- Conventional CAPEX and OPEX contributes for **3.6%[3]** of forecasted Canadian GDP and **1.6%** of forecasted jobs from 2024 to 2035
- **~15%** of the economic contributions from investment spend in one producing province **accrue to other provinces** (5% to other producing provinces; 10% to non-producing provinces)[4]

1: Direct Conventional Upstream CAPEX and OPEX
2: Average direct, indirect and induced annual jobs supported; 3. Includes exports
4: Includes cumulative export-based GDP, excludes royalties
Source: S&P Global Commodity Insights

Disclaimer

S&P Global Commodity Insights (“SPGCI”) divisional independence. SPGCI is a business division of S&P Global Inc. (“S&P Global”). S&P Global also has the following divisions: S&P Dow Jones Indices, S&P Global Market Intelligence, S&P Global Mobility, and S&P Global Ratings, each of which provides different products and services. S&P Global keeps the activities of its business divisions separate from each other in order to preserve the independence and objectivity of their activities in accordance with the S&P Global Divisional Independence and Objectivity Policy. Client’s receipt of SPGCI reports, data and information under this Agreement may also affect Client’s ability to receive services and products from other S&P Global divisions in the future.

S&P Global Commodity Insights publishes commodity information, including price assessments and indices. S&P Global Commodity Insights maintains clear structural and operational separation between its price assessment activities and the other activities carried out by S&P Global Commodity Insights and the other business divisions of S&P Global to safeguard the quality, independence and integrity of its price assessments and indices and ensure they are free from any actual or perceived conflicts of interest.

Limitation of Advice and Reliance. The Deliverables should not be construed as financial, investment, legal, or tax advice or any advice regarding Client’s corporate or legal structure, assets or, liabilities, financial capital or debt structure, current or potential credit rating or advice directed at improving Client’s creditworthiness nor should they be regarded as an offer, recommendation, or as a solicitation of an offer to buy, sell or otherwise deal in any investment or securities or make any other investment decisions. The Deliverables should not be relied on by Client in making any investment or other decision. Client may not use the Deliverables to transmit, undertake or encourage any unauthorized investment advice or financial promotions, or to generate any advice, recommendations, guidance, publications or alerts made available to its own customers or any other third-parties. Nothing in the Deliverables constitutes a solicitation by SPGCI or its affiliates of the purchase or sale of any loans, securities or investments. SPGCI personnel are not providing legal advice or acting in the capacity of lawyers under any jurisdiction in the performance of Services or delivery of Deliverables.

CAPP CANADA'S OIL & NATURAL GAS PRODUCERS

February 2, 2024

The Honourable Steven Guilbeault
Minister of Environment and Climate Change
Government of Canada
200, boul. Sacré-Coeur
Gatineau, Quebec K1A 0H3
(via email: ministre-minister@ec.gc.ca)

Re: CAPP Comments on the Government of Canada's Proposed Regulatory Framework to Cap Oil and Gas Sector Greenhouse Gas Emissions

Dear Minister Guilbeault:

The Canadian Association of Petroleum Producers (CAPP) is a constructive and solutions-oriented partner in addressing the triple challenge of reducing emissions while assuring domestic and western alliance energy security and affordability for Canadians. In this regard, CAPP and our member companies respectfully submit the following comments regarding the proposed regulatory framework to cap the oil and natural gas sector greenhouse gas emissions.

As we stated in our previous submission dated September 2022, CAPP is not supportive of the proposed regulatory framework to cap emissions from upstream oil and natural gas and emerging liquefied natural gas (LNG). CAPP is perplexed why the federal government has chosen to advance this framework option, when CAPP has explicitly advised against this policy approach given the consequential negative implications for our sector and Canada's economy. Under the cap-and-trade option presented, some producers will be forced to cut production to achieve the overly aggressive compliance obligation.

CAPP understands that it was the government's intent that the cap is targeted on emissions, not production[1]. There are other existing and proposed climate policies that will more effectively contribute to Canada's long-term emissions reductions goals. As a result, **CAPP requests that the Government of Canada not proceed with the unnecessary proposed cap-and-trade emissions cap on the oil and natural gas sector. Canada should work with industry and provinces on other effective and collaborative solutions that build on existing proven policy measures to deliver emission reductions in the short term and to position Canada and our energy industry for success in the long term.**

[1] https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/oil-gas-emissions-cap.html

2100, 350 – 7 Avenue S.W.
Calgary, Alberta
Canada T2P 3N9
Tel 403-267-1100

1820, 275 Slater Street
Ottawa, Ontario
Canada K1P 5H9
Tel 613-288-2126

1004, 235 Water Street
St. John's, Newfoundland and Labrador
Canada A1C 1B6
Tel 709-724-4200

201, 1114 Langley St.
Victoria, British Columbia
Canada V8W 1W1
Tel 778-265-3819

www.capp.ca • communication@capp.ca

Upstream Emissions Reduction Progress to Date
Oil and natural gas emissions peaked in in 2015[2] despite significantly growing production. Recent data shows[3] that our sector is making significant progress in reducing emissions, and we are taking measures to achieve further reductions. From 2012 to 2021, emissions from Canada's conventional oil and natural gas sector fell by 24% while production grew by 21%. Existing climate policies like the *Greenhouse Gas Pollution Pricing Act*, Clean Fuel Regulations and Methane Regulations, among others, are already enabling an accelerating, downward trajectory for upstream oil and natural gas emissions. The proposed emissions cap legislation is detrimental to the upstream oil and natural gas industry making further progress on emission reductions.

Potential Impact of Emissions Cap on Different Hydrocarbon Streams
CAPP's members produce nearly three quarters of Canada's annual oil and natural gas production and provide more than **400,000 direct and indirect jobs in nearly all regions of Canada**. In 2022 across Canada, our industry **contributed $111 billion to the gross domestic product (GDP)** in addition to **paying $45 billion in taxes and royalty payments**. With five oil and natural gas producing provinces, each with different hydrocarbon streams and local economies, impacts of the emissions cap policy on regional production may vary, with potentially disproportionate negative implications for national energy security and affordability. Compromising production over the next decade before consumers have the ability to switch to alternative sources of energy, may render millions of Canadians and the companies that power our economy vulnerable to scarcity at a time when global geopolitical tensions remain high.

LNG and Global Emission Reductions Recognition
The proposed emissions cap policy should recognize global greenhouse gas (GHG) reductions resulting from higher carbon fuel displacement with Canadian natural gas and LNG. While it is a positive step that Internationally Transferable Mitigations Outcomes (ITMOs) are included in the proposed emissions cap framework, the mechanism design will be inadequate to provide the certainty needed by proponents to advance investments in these global building projects.

Proposed Emissions Cap Limits
The emissions limits included in the proposed cap-and-trade framework design are directly based on 2019 production volumes with flexibility, in part, based on an uncertain future production scenario; therefore, the proposed framework is directly setting production volumes based on a production scenario. In addition, **the** latest **2023 production levels for natural gas have already exceeded the volumes used to set the upper legal limit included in the framework**.

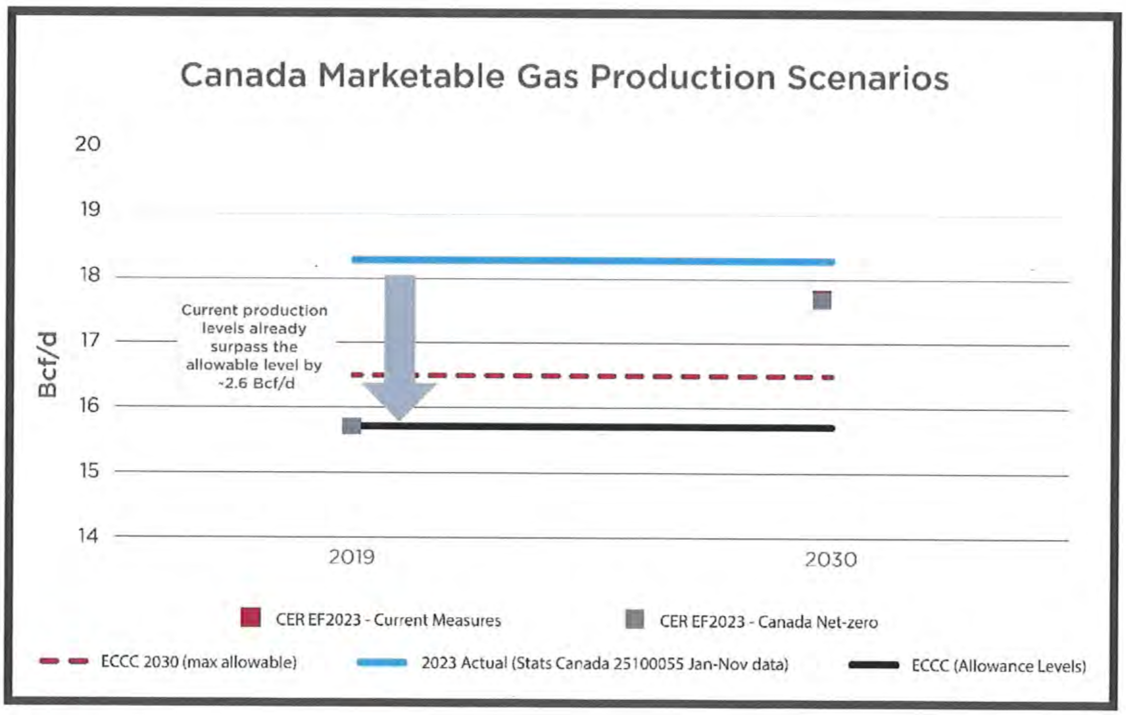
To this end, CAPP believes the emission reduction pathways to achieve government's proposed sectoral cap do not exist within the proposed time frame nor do the proposed alternative compliance mechanisms contemplated provide the needed flexibility. As a result, **the proposed emissions cap will result in curtailment of existing production and foregone future production**.

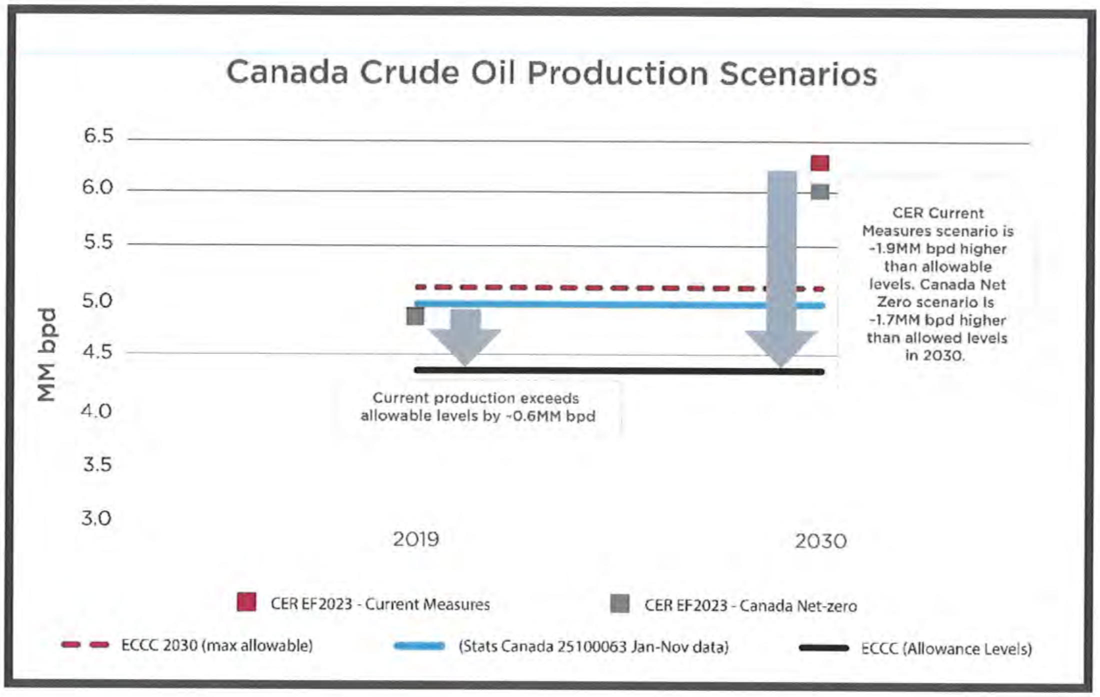
[2] National Inventory Report 1990-2021 (scope 1)
[3] https://www.capp.ca/wp-content/uploads/2023/09/Emissions-Performance-Data-Updated-2023.pdf

Methane
By ECCC's own account, the achievability of the proposed emissions cap reduction targets is heavily contingent upon the proposed enhanced methane regulations and estimates 33 to 37 megatonnes of carbon dioxide equivalent (Mt CO_2e) reduction in methane emissions by 2030. CAPP and its members have reviewed the proposed enhanced methane regulations and will be providing separate written feedback on February 14, 2024. Our preliminary analysis has identified **proposed methane abatement actions that are not supported by modern commercial technologies and are therefore currently technically infeasible**. In addition, currently the methane regulations remain focused on activities in the conventional oil and natural gas industry although the desired reduction targets are inclusive of broader sources.

Implications of an Emissions Cap
A one-sized-fits-all emissions cap will have differing impacts within the sector and regions where operations occur. Industry must be able to operate and attract investment capital or risk a decline in production, a loss of GDP, a loss in government revenues, and ultimately a loss in jobs.

The additional layering of cost from an emissions cap, coupled with the lack of protections for emissions-intensive trade-exposed (EITE) sectors, lack of realistic production projections and limited flexibility presented in the proposed framework will make further investment into the Canadian oil and natural gas sector more challenging and result in a decline in production. If this policy leads to production shut-ins, the average Canadian consumer will see higher energy prices, in particular home heating costs as there is potential for energy scarcity. As Canadians are experiencing a rising cost of living, government should be cautious that this policy does not further increase costs on the Canadian public.





Additive, duplicative policy weakens the effectiveness of existing policy tools including carbon pricing, methane reduction regulations, clean fuel regulations, offset systems and other provincial measures. This proposal isolates the oil and natural gas sector from existing carbon pricing programs and thus will impact both the price and overall demand of offset credits. The industry does not support a differentiated carbon price for the oil and natural gas industry alone. Any new climate policy should encourage lowest-cost reductions across the full economy.

A Path Forward
CAPP and the natural gas and oil industry support a more prosperous, balanced and sustainable future by working together to unlock Canada's full economic potential by maintaining a global perspective with respect to climate outcomes. Policies should drive worldwide emission reductions while also ensuring domestic, continental and western alliance energy security and encouraging investment in low-emissions jurisdictions. A realistic production outlook is needed to inform practical emission progress.

Canada needs to focus efforts on policies that can help reduce emissions, not shut in production, starting with how to best meet its climate ambitions and contribute to the global emissions reduction effort, all while maintaining good jobs and economic opportunities across Canada. **We encourage Canada to establish measures that incent reductions in methane, encourage carbon capture utilization and storage (CCUS), electrification, and energy efficiency, and to stop taking actions that slow investment in projects** that contribute to advancement of continued emission reduction progress in these areas and improve energy security in Canada and the world.

CAPP requests that the Government of Canada not proceed with the unnecessary proposed cap-and-trade emissions cap on the oil and natural gas sector.

In consideration of the above CAPP provides the following appendices highlighting key elements that need to be addressed and questions that must be considered should the Government of Canada continue to advance.

Sincerely,

Lisa A. Baiton, MBA, ICD.D
President & Chief Executive Officer

Cc: Hon. Jonathan Wilkinson, Minister of Energy and Natural Resources
Hon. Chrystia Freeland, Deputy Prime Minister and Minister of Finance
Hon. Seamus O'Regan, Minister of Labour and Seniors
Hon. François-Philippe Champagne, Minister of Innovation, Science and Industry
John Hannaford, Office of the Clerk of the Privy Council

Appendix 1

Additional Comments Regarding Emissions Cap Regulatory Framework

Use of Production Numbers
This whole policy, including the emission trajectory, is based on production forecasts/scenarios completed by ECCC and the Canada Energy Regulatory (CER). The volumes included in these estimates are scenarios and should not be considered as forecasts as these volumes can change based on a number of variables, which leads to a strong chance that the volumes used in the creation of the emissions limit will be wrong. The CER's description of why the scenario analysis is completed states "*We do scenario analysis to explore uncertainties facing the future of the energy system. The results in EF2023 are not predictions about the future. Rather, they are the product of scenarios based on a premise and a certain set of assumptions. Relying on just one scenario to understand the energy outlook implies too much certainty about what could happen in the future*."[1] As legal compliance obligations will be created from these stated production volumes, the use of them is not consistent with their intended use and is directly against the spirit of the policy, which intends to cap GHG emissions, not production.

CAPP has significant concerns and questions around the use of the production scenario to create the "upper legal bound." The framework claims that the legal upper bound is based on "The production levels based on ECCC's estimates of oil, natural gas, and LNG production for 2019, along with ECCC's estimates of the CER's Canada Net-Zero scenario." CAPP notes that upon review, the production volumes included in the emissions cap framework differ from the CER's net-zero scenario, which includes higher production growth for our sector. For example, the CER's net-zero scenario forecasted close to 900,000 additional barrels per day of oil coming from our sector in 2030 than was included in the framework. The production scenario used under the proposed emissions cap framework is problematic as it does not provide sufficient room for growth. In addition, the proposed 2019 baseline was a low production year that experienced production curtailments in Alberta and should not be considered representative of the sector. In 2022, Canada's total oil and natural gas production reached a record high of 7.7 million barrels of oil equivalent per day (MMBOE/d) and accounts for 6% of the world supply of oil and 4.6% of the world's natural gas supply.[2] Canada's production is expected to reach an all-time high in 2023 at 8.5 MMBOE/d (including natural gas liquids - NGLs)[3] and yet the emissions cap levels are based on 2019 emission rates. Government must use newer and more appropriate data in the modelling, otherwise there will be large unintended consequences for our sector and the Canadian economy. Figures 1 and 2 included below demonstrate the differences of several scenarios compared to those presented in the policy framework as well as current estimates of 2023 actual production.

---

[1] CER – Energy Future 2023: Scenarios and Assumptions (cer-rec.gc.ca)
[2] CAPP Data Centre
[3] CAPP Data Centre

Figure 1: Canada Marketable Gas Production Scenarios

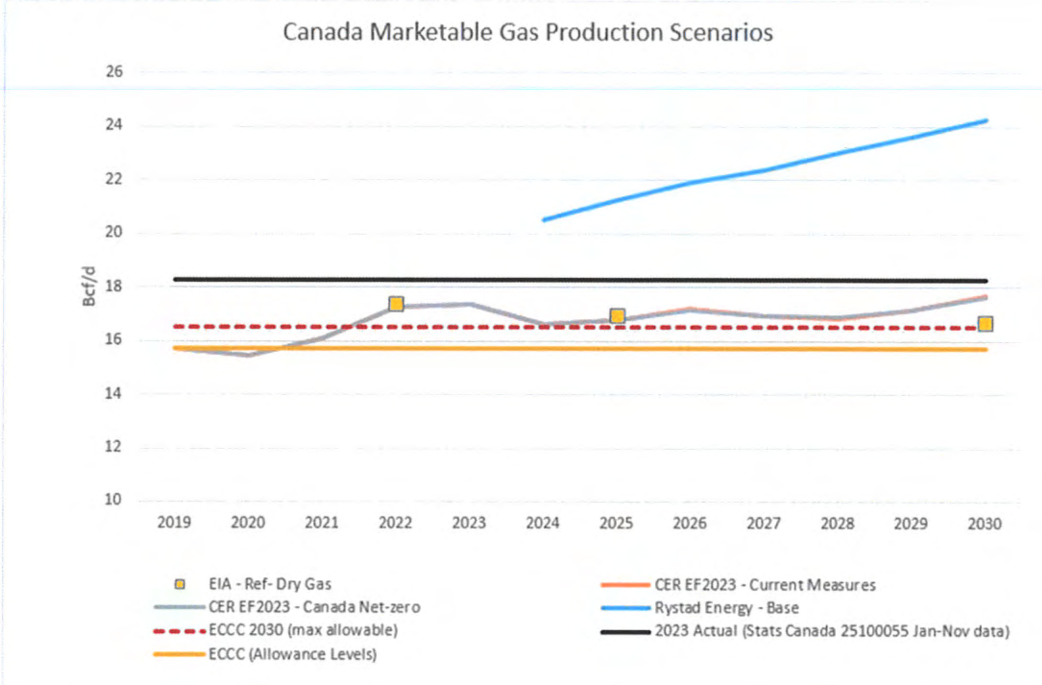
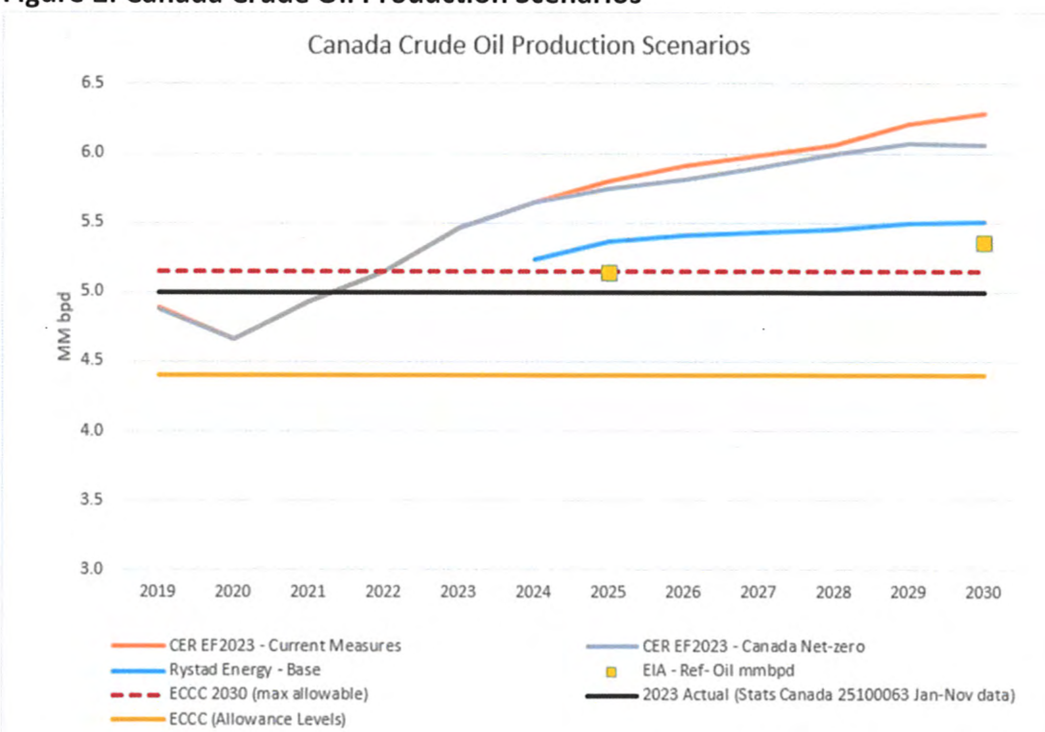


Figure 2: Canada Crude Oil Production Scenarios



Upper Legal Limits

One of the key elements of the proposed emission cap framework is the creation of a "buffer zone" to enable compliance flexibility. CAPP does not believe that the buffer provides adequate flexibility to protect from carbon leakage and to protect competitiveness. Additional to the concerns raised above regarding the data used to calculate the buffer, the proposed trajectory is already too steep and quick. The 25 megatonnes (Mt) compliance flexibility will not be enough to accommodate for growth and will lead to production shut-ins. This risk is only further compounded by the fact that compliance options are limited to 20% of a facility's obligation.

Emission/Credit Allocation Allowances

One of the key aspects of the emission cap policy is how credits will be allocated and compliance obligations will be determined. Many other cap-and-trade systems are based around auctions where companies can purchase emissions allowances and these systems tend to carefully model the removal of allowances and impacts on prices over time to not overburden their economy. It is unclear how allowances may be allocated to facilities under this policy.

CAPP requires more information on how emissions will be allocated prior to being able to evaluate and properly comment on this policy.

Technical/Regulatory Feasibility

In the framework, the emission limits were informed by reductions assumed to be technically feasible by 2030. CAPP cautions that just because technology exists does not infer the technology is feasible economically or on short timelines. Our sector is committed to reducing emissions and technology plays a large role, but the levels of technology deployment assumed in the framework are too aggressive by 2030. CCUS and electrification deployment within the conventional oil and natural gas sector will require large amounts of capital, regulatory efficiency and time to construct; the current timelines are challenging and will make a number of the assumed emissions reductions by government under the framework unfeasible.

<u>CCUS</u>

CCUS requires large amounts of capital and currently many of the intended programs to support CCUS, such as the investment tax credit, are either not yet in place (Alberta ACCIP) or not sufficient (federal ITC). Solving the economic issues will be required before large-scale adoption could even begin. Additional to the economic challenges facing CCUS, it will also require significant timelines for completion due to planning, internal approval processes, potential material, and labour issues. The overall 2030 target for CCUS is overly ambitious due to the short timeline. Our industry is committed to being a world leader in CCUS, but this will not all occur by 2030. The government must ensure that the framework truly evaluates the realities for CCUS when determining potential 2030 contributions to emission reductions.

<u>Electrification</u>

Some of our operations in northeast British Columbia are already electrified and among some of the lowest carbon intensive producers in the world. They were able to do this because they are in proximity to already existing transmission lines being powered by renewable electricity. This is not true for many other operations in B.C. where there are no transmission lines but also in Alberta where the grid is powered primarily by natural gas. For our sector to electrify operations will require third parties, both Crown corporations and private companies, to build out the necessary green electricity and the needed corresponding transmission lines. As our facilities operate 24/7 and need guaranteed power to ensure that we meet health and safety standards, our sector cannot truly move until that reliable electricity is readily accessible to us. As has been shown by Site C dam in B.C. and the Muskrat Falls dam in Newfoundland and Labrador, these new sources of electricity can take decades to be completed. CAPP analysis shows that to reduce 3 to 4 Mt CO_2e of emissions would require approximately a gigawatt of new energy coming online based on the estimated average grid emission intensity of western provinces by 2030. For reference, the new site C dam in B.C. will provide 1.1 gigawatts.

Methane

By ECCC's own account, the achievability of the proposed emissions cap reduction targets is heavily contingent upon the proposed enhanced methane regulations, and estimates 33 Mt to 37 Mt CO_2e reduction in methane emissions by 2030. Our preliminary analysis has identified proposed methane abatement actions that are not supported by modern commercial technologies and that are therefore currently technically infeasible. In addition, currently the methane regulations remain focused on activities in the conventional oil and natural gas industry although the desired reduction targets are inclusive of broader sources. If methane remains under the cap, it will be critical to ensure that any methane targets from known sources are achievable in order for the cap itself to be achievable.

LNG

CAPP also requests clarity on what technological assumptions were used in the CER net-zero scenario that led to the LNG sector having -1 Mt of emissions in 2030. As LNG is coming online as efficiently as possible and there will be a limited number of facilities, CAPP requests clarity on what assumptions were made to deliver negative emissions.

Benchmarking/Groupings

The oil and natural gas sector is complex, with many different types of products such as natural gas, condensates, natural gas liquids, heavy and light oil, bitumen and synthetic crude oil, which are spread across the country. Each of these different products and production types have different emission profiles, and a one-size-fits-all approach to benchmarking could create significant negative impacts. How the policy benchmarks and groups the many different resource types within our sector will require careful thought and evaluation. If done improperly, this policy could lead to negative impacts on certain types of production in certain jurisdictions resulting in disproportionate impacts across the sector and the country.

Beyond 2030

For businesses looking to invest in decarbonization projects, policy certainty up to and beyond 2030 is key. Many of our sector's operations have long operating timelines that extend decades. Currently, this policy does not provide any clarity on what may occur after 2030, what compliance obligations will be incurred or the ability to operate facilities given the upper legal limits. This lack of post-2030 details create uncertainty and will make Canada a less attractive place to invest.

New Entrants

The management of new operations and the associated new production coming online is integral to any new policy. New entrants will leverage technology; however, they will also come online with both production and emissions. To provide investment certainty the policy will require a new entrant approach and understanding of requirements post-2030 within the framework to provide certainty to those making significant investment in long-term projects. New projects are key in deploying modern technologies in the industry that contribute to decarbonization and improved performance of the sector over time.

Greenhouse Gas Emission Reporting Program (GHGRP) Gaps

CAPP has concerns with reporting gaps from many of the sources proposed for inclusion in the program and the evaluation of the oil and natural gas sector's emission profiles. Currently, the data set used by the government does not represent a complete view of emissions from our sector because the GHGRP does not include emissions from sources under 10,000 tonnes of CO_2e annually. These smaller volumes are characteristic of most emissions from conventional oil and natural gas, which includes hundreds of thousands of well sites, thousands of facilities/processing and hundreds of operating companies.

Additionally, many methane emissions included in the proposed system are currently determined by estimation and modelling. While this approach has worked for the methane regulations to guide activities that would support reductions where flexibility was included in the program, now with this data being used to set trajectory and legal limits, the use of estimates determined through modelling will to create large issues when allocating compliance units to facilities within the cap-and-trade system.

Scope 2 Inclusion

For many oil and natural gas operations, Scope 2 emissions come from purchased electricity and in most instances are outside of the operator's control. Crown corporations or third-party utility companies are responsible for the emissions associated with electricity generation and the oil and natural gas sector has little ability to influence this. Electrification of combustion sources requires significant capital investment from both our sector and generators and will require timelines that could span decades to build the required energy infrastructure and supply. Electrical transmission lines are particularly challenging as the average time to plan, permit, construct and energize is now 8 to 15 years.[4] Achieving a reduction of 3 Mt year from electrification in our sector would require a significant increase of generation capacity in addition to accessible sources. Currently additional wind and solar generation capacity is under a temporary pause in Alberta. Our sector depends on reliable energy sources to support production operations to ensure they can operate in a consistent and stable manner 24 hours a day, 7 days a week delivering the energy that both Canada and the world needs, so ensuring the policy does not create any more impediments to uptake is vital. Any potential inclusion of Scope 2 emissions under the proposed emissions cap may prevent electrification or create the inverse incentive for operators not to electrify and reduce Scope 1 emissions.

***Canadian Environmental Protection Act* (CEPA) Legal Aspects**

CAPP and our members have concerns with the emission cap being legislated under CEPA as it includes legal provisions. As outlined in section 272 (2),7 significant monetary penalties would be introduced or even potential criminal penalties for non-compliance. As our sector does not believe the reduction targets in the proposed policy are achievable, we are concerned that emission targets may not be met as a result of factors outside the control of facilities and could have detrimental impacts on our sector due to the legal aspects under CEPA.

Additionally, the generation of a regulation under CEPA removes flexibility for both industry and government. There are concerns that, as proposed, a cap-and-trade system under CEPA will not encourage decarbonization of the production mix but will result in operators having to scale back investment or shut-in production to meet reduction targets as a result of the lack of flexibility under CEPA. Compliance mechanisms are limited to 20% of total compliance obligation, which is inadequate and will lead to shut-ins if the trajectory is not appropriate. The Government of Canada should reconsider the decision to have this policy under CEPA and consider other approaches to support emission reduction.

[4] S&P Global 2023

Administrative Burden

The proposed system will be cumbersome and costly to manage for both industry and government.

For example, the current data sets available to the Government of Canada will not be sufficient to support this policy framework. The government must consider how to obtain this data without creating undue cost and administrative burden.

Given the proposed emission cap option is a complete and separate policy from the output-based pricing system (OBPS), this policy will require a completely new system separate from the OBPS. This new system will require significant development and administration by the government as well as new monitoring reporting and verification requirements for industry.

The proposed cap-and-trade system will require tremendous resources from both government and industry. The resources used on this new complicated system could be better spent on additional emission reductions activities that are already incentivized by other programs such as methane reduction and carbon pricing. Overall, the complexity and administrative burden that will come from this policy will only impede and slow down overall progress in other areas.

Cap-and-Trade/Dual System Complications

Currently, all oil and natural gas facility emissions are covered by provincial carbon pricing programs. A new cap-and-trade system will double-regulate all these emissions, limiting new incentives to reduce emissions. Companies will now be expected to keep track of two similar but separate data sets and two compliance management plans.

Companies will now be under two different carbon pricing regimes; the overlap and crossover will create complications not efficiency, which will only impede and slow down progress that is already underway.

Impacts to Other Environmental Programs

CAPP is concerned that the proposed emission cap will have a negative impact on other already existing policies in the country that have already led to significant emission reductions. The proposed cap weakens existing policy tools including carbon pricing, methane reduction regulations, clean fuel regulations, offset systems and other provincial policies, and separates the oil and natural gas sector from existing carbon pricing programs which thus may impact both the price and overall demand of offset credits. The industry does not support a differentiated carbon price for oil and natural gas alone. Any new climate policy should encourage lowest-cost reductions across the economy.

Competitiveness/Capital Leakage

Canada is well positioned to continue to be a world supplier of energy, but our industry must continue to be able to operate and attract investment capital. Canada has introduced carbon pricing programs that create an incentive for industry to reduce emissions while managing competitiveness impacts and allowing for new investment. The proposed emission cap would erode these protection mechanisms. The additional layering of cost from an emission cap as proposed, coupled with the lack of protections for EITE sectors and lack of flexibility proposed for cap-and-trade compliance, will make further investment into the Canadian oil and natural gas sector more challenging, resulting in a likely decline in production, a reduction of GDP and job losses. The oil and natural gas extraction industries account for 5.4% of Canada's GDP or $110.5 billion in 2022.[5] As such, the emission cap must be designed in a way that does not negatively impact investment and

[5] CAPP Data Centre

does not negatively impact the Canadian economy. Investors in other sectors may also factor this increasing regulatory complexity into decisions.

The OBPS system used by the majority of jurisdictions in the country contemplated competitiveness impacts and the potential for carbon leakage. The federal OBPS test looked at a sector's overall economic competitiveness and determined EITE provisions to help protect against carbon leakage. The federal government identified the oil and natural gas sector as one that faces high foreign competition and at risk of carbon leakage. This new emission cap makes that previous work and the protections under the OBPS ineffective, as the increased costs from the cap erodes any protection under the OBPS system. CAPP requests further engagement on the modelling done by ECCC to show that our industry is not EITE and at risk of carbon leakage.

It will be essential that any revenue created from the policy is returned to industry to help with decarbonization projects, otherwise the policy has risk of stranding capital and making it more difficult for companies to invest in their operations.

Differential Price Across the Economy/ Ring Fencing

Of key concern is how the proposed options for implementing an emission cap may require the removal or separation of the oil and natural gas sector from existing carbon pricing programs. By "ring fencing" the sector, operators' participation in existing programs will be limited. As a result, the proposed policy options risk negatively impacting the sector. This impact includes other stakeholders; isolating oil and natural gas facilities from generating offset credits under existing programs (e.g., TIER in Alberta) and could have a large impact on both the price and overall demand of offset credits. Our industry is one of the largest purchasers of credits across the country and limiting our ability to exchange credits from outside our sector could cause a downward impact on the overall price of credits and number of credits generated. It is difficult to imagine how this would not directly lead to a weaker incentive for non-regulated participants to reduce emissions. This could limit the ability for other areas of society to contribute to emissions reductions as the largest domestic credit/offset users are now out of the market. Carbon pricing was brought into Canada to help encourage reductions; limiting our sector's ability to invest and support in reductions across the economy will be detrimental. In Alberta, offsets generated in 2021 and 2022 were 7.8 and 6.7 Mt CO_2e respectively.[6] Industry has used offsets to enable lower-cost reductions for decades. Our industry does not support a differentiated price of carbon for our sector alone and believes that any new climate policies should not isolate one sector from an economy-wide approach.

Aggregate Emissions

The framework mentions plans to utilize aggregate systems to manage smaller emission sources similar to provincial carbon pricing programs. This will be challenging under the emission cap as the existing aggregates systems are designed for carbon pricing programs and would not be fully applicable under the emission cap. Currently, the aggregates of emissions under carbon pricing do not include methane emissions as they are covered by the methane regulations, so new forms of aggregates will need to be created. Additionally, activities in the aggregate may not always be production based such as small compressor stations, and determining their potential compliance obligation will be challenging.

[6] AB Offset Registry https://alberta.csaregistries.ca/GHGR_Listing/AEOR_Listing.aspx

Regional/ Product Differences

Oil sands, conventional, offshore oil and processing are completely different resources that operate in very different fashions, have different emission profiles and different opportunities for reductions. The same is true for natural gas where sweet and sour operations differ drastically in terms of how the gas is processed and have different emission profiles. This is why the OBPS system has differentiated benchmarks for each of the different resource types within the oil and natural gas sector. Appropriate sub-sector benchmarks have been created to manage the complexity of the sector and provide flexible approaches to treatment under carbon pricing to ensure no unintended consequences. For example, in offshore operations, due to their distance from land, health and safety requirements and limited platform space to accommodate additional equipment, have limited ability to reduce emissions in the short term and the offshore industry will require its own unique considerations to ensure no shut-ins occur. An emission cap policy must address any product type differences; a one-size-fits-all approach will be problematic and if not managed under the emission cap could lead to dramatic consequences for certain production types.

As there is tendency for some of these production types to be grouped in geographical areas, there is a risk that if the emission cap is not done in a way that recognizes the unique operational types across the country, it could have significant impacts on certain regional groups. For example, all of the offshore oil is currently located in Newfoundland and Labrador.

Trajectory

The overall trajectory and emissions forecast for the sector is as important as the policy tool. The emissions reduction trajectory needs to reflect a realistic timeline and the limitations of advancing emission reduction projects given the stated intent to cap emissions and not production. Targets must reflect what can be realistically achieved technically, economically and within reasonable timelines. Technical possibility does not automatically infer economic or practical feasibility within a given timeline. The government must work with industry to ensure any trajectory that is introduced is based on real data and reflects what is possible. The current proposed emissions reduction trajectory remains overly aggressive (35% to 38% reduction from 2019) timeline given the many decarbonization constraints, the limited time to 2030 and the fact that 2019 was not a representative production year.

This target does not provide sufficient time for the sector to execute the many large-scale emissions reduction projects that will be required. CCUS, electrification and other large-scale technologies that will be needed by our sector are complex, expensive and depend on government or other third parties to implement. For example, permitting and environmental approvals are lengthy processes in Canada and are likely to impede short-term reductions from out sector. The two main long-term emission reduction opportunities – CCUS and electrification – both require significant leadership and execution by government at federal and provincial levels. Key to this will be permitting and policy creation that encourages uptake of emission reductions. Recent modelling has shown that electrical transmission lines are particularly challenging as the average time to plan, permit, construct and energize is now 8 to 15 years.[7] This does not align with such a steep trajectory under the emissions cap. Additional items will also need to be created before our sector can move forward with large-scale investments such as a federal CCUS framework that enables our sector, a CCUS investment tax credit (ITC) that does not reduce after 2030 and includes enhanced oil recovery (EOR), carbon contracts for difference, Internationally Transferred Mitigation Outcomes (ITMOs) other accompanying policies will also need to be created and as 2030 is fast approaching it leaves little time. S&P Global found that on average CCUS projects take 6 to 10 years for projects to move

---

[7] S&P Global 2023

from planning to the start of storage operations[8] and possible electrification could not occur until the 2040s. The government must be aware of realistic timelines for our sector and create realistic targets and trajectories that won't force production shut-ins.

2026-2030 Interim Period

In the framework, the government mentioned that there will be consideration of how to manage the interim period of 2026-2030. As 2030 is quickly approaching, the government should not introduce any more uncertainty by implementing any measures prior to 2030 that will only further complicate an already complex and unnecessary policy.

Internationally Transferred Mitigation Outcomes (ITMOs)

CAPP notes the reference to the potential Inclusion of ITMOS for compliance and is supportive of their inclusion in all environmental policies in Canada. We believe Canada, through low carbon intensity natural gas, LNG and oil, can help lower global emissions by displacing higher-emitting energy sources such as coal. By acting globally, Canada can make an outsized contribution to addressing climate change. The International Energy Agency (IEA) World Energy Outlook states that switching to natural gas has already helped to limit the rise in global emissions since 2010, alongside the deployment of renewables and nuclear energy, and improvements in energy efficiency. On average, coal-to-gas switching reduces emissions by 50% when producing electricity and 33% when providing heat.[9] We recognize that maximizing the climate benefits of switching to natural gas requires best practices to reduce methane leaks, and as noted previously, Canada has a proven track record in this regard. Analysis by the B.C. government and the B.C. Business Council demonstrates that LNG produced in B.C. has a lower emissions intensity than LNG from competing suppliers.[10] LNG exports from B.C. can help to reduce global emissions by displacing more carbon-intensive fuel. To realize this LNG opportunity, all emissions-reduction initiatives need to be structured in a way that avoids inhibiting the growth of LNG production.

We believe this is a leadership role Canada can take in the global fight against climate change. A limit of 20% on the use of offset credits including ITMO for compliance does not offer adequate flexibility and will make the uptake of ITMOs more challenging. The government of Canada should advance the ITMO market and begin contributing to improved global emission reduction outcomes.

Foreign Trade

The Canadian oil and natural gas sector is important not only to Canada but to many of our allies and trade partners around the world. The Canadian oil and natural gas sector is often covered under many different trade agreements and can be vital to the success of our partners' economies. For example, the United States relies heavily on specific types of Canadian crude for the refineries to make asphalt and other essential products. The emission cap could also have an impact on the production of certain Canadian products, which in turn could impact our economic partners. The emission cap must not interfere with Canadian production so that we can continue to provide the needed resources to our allies and partners.

Imports

CAPP has concerns around provisions for oil, natural gas and other derived products that are imported into Canada. As currently proposed, the emission cap framework neither considers nor mentions any reference to how imports would be managed. If the emission cap were to be introduced without some treatment for

---

[8] S&P Global 2023

[9] IEA. *The Role of Gas in Today's Energy Transitions* https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions

[10] https://bcbc.com/dist/assets/images/photo-gallery/lowcarbonadvantage/MNP-LCIS-Sector-Results.pdf

imports, it would create an uneven playing field for Canadian resources when the imports are not priced, nor subject to an emissions cap. It will advantage other nations who likely do not have the same commitment for environmental stewardship as Canada. By not addressing imports and carbon leakage to other jurisdictions, this policy will hurt local economies, increase production in jurisdictions without strong environmental regulations and will weaken Canada's energy security by making Canada more reliant on imports. Imports and the impact to Canada must be fully thought through before any introduction of an emission cap.

Emission Cap Coverage

It will be key to the design of the policy to clearly define the "ring fence" of participation in the cap-and-trade system. A significant amount of conventional oil and natural gas emissions come from facilities that process hydrocarbons and are not wholly owned by oil and natural gas producers, instead they are owned by midstream companies. Ensuring that the appropriate "ring fence" is created and the correct stakeholders are included in the emission cap policy will be vital to its design.

Appendix 2

Questions for the Federal Government Regarding the Potential Consequences of the Proposed Emissions Cap on Oil and Gas

1. How will the proposed emissions cap legislation define the "ring fence" of participation in the cap-and-trade system? In other words, how will the oil and gas industry be defined? A significant amount of conventional oil and natural gas emissions come from facilities that process hydrocarbons and are not owned by oil and natural gas producers, but they are owned by midstream companies. Oil and natural gas producers do not have any control over how third-party facility operators spend their capital on decarbonization.
2. How will the legislation interact with the *Greenhouse Gas Pollution Pricing Act* (GGPPA), and its provincial equivalents in major hydrocarbon producing jurisdictions? Will the OBPS benchmarks and targets in the GGPPA be synchronized with the emissions cap levels over time? Have the impacts of double carbon taxation on future hydrocarbon production been modelled by ECCC?
3. The proposed cap-and-trade system will only allow trading with the oil and natural gas industry. The business of oil and gas supplies a multitude of hydrocarbon production streams (e.g. bitumen; a range of oils from heavy to light; condensates; natural gas and Natural gas liquids), each with distinct carbon characteristics. Have the effects of intra-industry competition for carbon credits, especially the effects on vital production such as natural gas streams to Canadians, been considered and modelled? How will allowances be calculated and offered to ensure intra-industry competition doesn't impede the supply of vital petroleum products?
4. In 2023, Alberta's Technology Innovation and Emissions Reduction (TIER) Fund was forecasted to receive \$637 million[1] with a significant amount being contributed from the oil and natural gas industry. In addition, the total compliance obligation in Alberta included the use of credits through carbon markets under the provincial equivalent TIER industrial pricing program. The largest offset generation project type in Alberta historically is wind electricity generation. The level of wealth transfer from emitters to clean energy companies is expected to grow with the increase of carbon price from \$65/tonne in 2023 to \$170/tonne in 2030 (in the absence of the proposed cap-and-trade system). Have the consequences of adding a competitive layer of intra-industry carbon levy, on top of the existing carbon markets that serve clean energy companies, been considered and quantified? There is a potential that if a ringfence is created for the oil and natural gas sector it could lead to decreased credits and transfers to clean energy companies, has government modelled the impact of a potential cap on green energy companies?
5. A substantial portion of Canada's oil and natural gas production is exported to the United States. The proposed emissions cap has the potential to seriously reduce Canadian supply of hydrocarbon streams into vital North American supply chains established over the past century. Has the response of customers and the State Department in the United States been considered?
6. The proposed emissions cap legislation layers on top of existing carbon policies (GGPPA or provincial equivalent, methane, etc.) for upstream producers. The proposed cap also chains and interacts with federal downstream legislations like the Clean Fuel Regulations and the proposed Clean Electricity

---

[1] 2023-26 Fiscal Plan (Alberta Budget 2023) – February 28, 2023

Regulations. What is the impact of introducing yet another piece of carbon legislation on the top of existing policies, and ultimately what is the expected impact on energy affordability and security to Canadians?

7. In 2023, government revenues (federal and provincial) from the upstream oil and natural gas industry was almost $40 billion: $17 billion in income taxes and $22 billion in royalties. Has the potential impact of the proposed emissions cap legislation on government revenues been calculated?
8. Investors pull capital away from industries in the presence of complex and burdensome policy, perceived or real. Has the impact of the proposed legislation on investment been estimated? Access to private capital will be paramount to decarbonizing upstream operations with processes like carbon capture use and storage (CCUS). In this regard, the emissions cap may result in a difficult-to-understand policy that theoretically encourages decarbonization but turns away private capital to finance the reduction of carbon emissions. What is the estimated impact on major investments in CCUS projects, electrification, and other major reduction opportunities as a result of the increasing costs.
9. The oil sands and conventional oil and natural gas businesses are distinctly different across many dimensions including carbon intensity, concentration of operations, geography, geology, availability of decarbonization options, and so on. Have the differential impacts on each business sector been modelled as well as corresponding impacts to the communities in which they operate across the full Western Canadian Sedimentary Basin all the way to the offshore?
10. How will emission reporting under the proposed cap reconcile to the National Inventory Report (NIR)? Will all emission sources currently within NIR be included in the emissions regulated by the cap?
11. As cost-containment measures are a standard feature in cap-and-trade design, what options are being considered?

Cardinal Energy Ltd. (Cardinal) appreciates the opportunity to provide feedback to Saskatchewan's Economic Impact Assessment Tribunal (the "Tribunal") on the Federal Government's proposed Oil and Gas Sector Greenhouse Gas Emissions Cap (the "Cap") and Regulations Amending the Regulation Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector) ("Methane 75"). Cardinal respectfully requests the Tribunal consider this feedback in formulation of a report on the potential impact these two policies may have on organizations operations in Saskatchewan.

Cardinal, based out of Calgary, Alberta, operates a large CO2 Enhanced Oil Recovery (EOR) operation in Midale, Saskatchewan. This is an operation which is almost fully electrified and sequesters tens of thousands of tonnes of carbon dioxide annually. Cardinal is also progressing development of a greenfield Steam Assisted Gravity Drainage (SAGD) Project in Western Saskatchewan, with potential to develop further phases. Cardinal is committed to development of economic and environmentally responsible projects in Saskatchewan, which has historically been an encouraging Province for sustainable investment. Execution of these growth projects will provide significant revenue, jobs and opportunities in Saskatchewan, however these growth projects can only be executed if project certainty can be provided. Both the "Cap" and "Methane 75" policies, despite both only existing as draft frameworks at this time and thus a detailed impact analysis cannot be completed, present Cardinal and other organizations operating, or planning to operate within the Province with significant risks. These risks could be summarized under many overarching categories, however the most obvious one to Cardinal would be the significant investment risk these two policies present to any investment within the Province:

The "Cap" presents an impossibility regarding making sound long-term capital investment decisions, as it lends itself to many difficult questions being asked, including:

- What fraction of emissions required for companies to maintain current product output levels will be allocated to companies on an annual basis?
- How would this fraction change year-over-year dependent on how a company compared relative to its peers in that product class, and industry as a whole?

- How could this variable fraction of required emissions be reasonably layered into project economics with any certainty?
- How could performance of peers be layered into project economics with any certainty?
- How could additional emissions from peers starting new projects be layered into investment decisions with any certainty?
- If emissions in a given year were already at the legal upper emission limit, would a newly constructed facility be unable to commence production? Or would an existing facility have to be prematurely shut-in to allow for the new facility to start up?
- What additional reporting requirements will be associated with a new National cap-and-trade system, how will that be administered, and what burden will that bring? How will a National cap-and-trade system impact Saskatchewan's autonomy to responsibly manage it's own resources?

"Methane 75" provides an additional risk to making capital decisions for project investment:

- The current framework states the regulation would be source-based, with strict limits and controls on leaks, vents, flares, and pneumatic equipment. Without knowing these limits, how could processes or equipment be specified and selected? Would these limits be technically feasible?
- Will the limits sterilize investment in some jurisdictions within Saskatchewan, for instance if gas takeaway infrastructure is limited or not possible in a particular area?

Cardinal opposes additional greenhouse gas emissions regulations, and in particular the "Cap" on oil and gas emissions, as it is a direct cap on production capability. There are many duplicative policies already in play that hamper investment in Canada, and implementing further emissions policies will make the Province of Saskatchewan, and Canada even more uncompetitive with other jurisdictions and further tarnish Canada's business reputation. Cardinal appreciates the opportunity to provide feedback that proposed policy may have on business within Western Canada and the county.

Sincerely,

Tim Wozney, P Eng | (403) 852-0961 timw@cardinalenergy.ca

ENSERVA™ 333 5 Ave SW Suite 310 Calgary, AB T2P 3B6 403.264.4195 enserva.ca

August 12, 2024

Executive Director Ken Dueck
Economic Impact Assessment Tribunal Secretariat
eiat@gov.sk.ca

Subject: Enserva's Submission to the Economic Assessment Tribunal on the federal Oil and Gas Sector Greenhouse Gas Emissions Cap

Dear Mr. Dueck,

On behalf of our over 200 member companies representing the energy services, supply, and manufacturing sectors, we present the following submission to the Economic Assessment Tribunal regarding the federal emissions cap for the oil and gas sector.

Canada has the capability to be a key global supplier of cleaner energy sources with ESG standards that are second-to-none. Canadian oil and gas can displace the use of coal as well as Russian-supplied oil that funds war in Ukraine and is not held to Canada's regulatory standards. Canadian oil producers and service companies are also actively investing in technology and practices that reduce emissions produced across the entire energy value chain and have been doing this work for decades.

While an emissions cap is not directly a cap on production, the technical assumptions and short timeline proposed in the framework pose a severe risk of requiring production at levels below market demand, effectively making it a production cap.

Our concerns over the short and long term impacts of an emissions cap on the oil and gas industry are extensive. Our primary concerns are summarized below.

Repercussions on entire Canadian economy

The economic benefit of the oil and gas industry to Canada's economy cannot be overstated. In 2022, total capital expenditures in the oil and gas sector reached over $37 billion, resulting in nearly $270 billion in revenue to be put back into the Canadian economy via technological innovation, job creation, and community support programs.[1] Looking at employment alone, the oil and gas sector supports over 400,000 jobs across Canada, majority within the prairie provinces.[2]

In addition to the direct benefits of the oil and gas revenue, the indirect benefits – namely though royalties paid to provincial and federal governments – pay for the social services that set Canada apart and make it an attractive country for newcomers and young people to call home.

1 Oil and gas extraction, 2022. Statistics Canada. Accessed January 31, 2024.
2 Energy Fact Book 2023-24. Natural Resources Canada.

Modelling predicts that an accelerated phase-out of oil and gas could severely impact Canada's GDP growth, with losses building to $100 billion in 2050.[3] This reduction would lead to significant declines in export revenues, job creation, and income levels across sectors due to stifling one of the country's most productive industries. The emissions cap threatens to disrupt not only the local economy but also the national economic framework, undermining the sector's contributions to technological innovation and community programs.

It is essential to recognize that the energy industry's ability to invest in low-emissions technology and sustain economic growth hinges on maintaining a competitive and robust market environment. Anti-competitive policies will only stifle these advancements and exacerbate economic challenges, highlighting the need to reconsider the proposed emissions cap in favor of approaches that support long-term industry stability and economic prosperity.

Theat of environmental consequences

The proposed cap, while aimed at reducing greenhouse gas emissions, could lead to significant unintended consequences around emissions reduction, notably through the threat of carbon leakage. Emissions reduction must be viewed through a global lens rather than confined by national boundaries. Canada's greatest opportunity in the fight against climate change lies in our capacity to displace emissions-heavy and irresponsibly produced energy from countries with lower regulatory and ESG standards. This potential cannot be realized if the industry is stifled by anti-competitive policies that limit production capacity.

The energy sector is among the largest investors in low-emissions technology and innovation, and this significant investment is critical for global progress in reducing emissions. However, such advancements require a competitive and robust industry for sustained funding and development. Therefore, an incentive-based approach, supporting ongoing innovation and investment, would better align with global environmental objectives.

Jeopardizing economic reconciliation

The energy industry – specifically, the energy services industry – is the largest employer of Indigenous people in Canada. In 2021, Canada's energy industry employed approximately 13,000 Indigenous workers, representing 7.3 percent of the energy labour force. This share is notably higher than their representation in the overall workforce, which sat at 4.2 percent in 2021. Indigenous employment within the energy service sector specifically represented 8.8 percent.[4]

In addition to employment levels, the energy services industry has made proactive efforts to build relationships and mutually beneficial agreements with Indigenous communities. The proposed emissions cap and subsequent limits on production would hinder the capital allocation for expanding on these economic partnerships, impeding our industry's work towards continued engagement and reconciliation.

---

[3] Modeling Energy Transition Scenarios for Canada: Aggressive decarbonization vs. accelerated oil and gas phaseout. The Public Policy Forum. May 2023.
[4] Profile of Indigenous Energy Workers. Careers in Energy. June 2024.

Beyond the many Indigenous partnerships, employment, and training opportunities funded by the sector, Indigenous engagement and ownership in resource projects is at an all-time high. Since 2012, First Nation and Metis communities across Canada have acquired nearly $10 billion in equity in energy and resource projects, including $1.8 billion of equity in pipelines, and hundreds of millions more in discussion.[5] Many of these projects have only been possible because of loan guarantee programs by provincial governments, which they are able to fund through royalties from the oil and gas sector.

These projects provide tangible and long-lasting economic benefits that can support First Nations for decades through reliable funding and career opportunities. They also are a clear indicator of Indigenous consent and successful consultation, supporting overall reconciliation efforts.

Curtailing the oil and gas industry will jeopardize the wealth and stability of every Indigenous community with equity in these projects and those looking to secure loans for future projects, inevitably setting back Canada's and private industry's efforts at economic reconciliation. For several years, the federal government has committed to supporting initiatives that unlock the potential of First Nations lands and return decision-making over the use of that land to Indigenous communities. First Nation ownership in resource projects is the result of those efforts, and government interference in these projects and the profitability of these contracts goes against the spirit of reconciliation.

Impact on competitiveness and investment attraction

The need for long term certainty, clear policy, and stable regulatory requirements has never been more necessary, as Canadian industry finds itself competing for investment with the United States' Inflation Reduction Act. An emissions cap gives investors reason to disregard Canadian projects, solely due to the many unknowns in how this path will affect the energy industry, as well as the many other industries that benefit from a thriving oil and gas sector such as commercial real estate, housing, manufacturing, transportation, and more.

The sector-specific nature of the emissions cap introduces anti-competitive distortions that contradict global energy market trends. All realistic energy mix predictions indicate that oil and gas will remain essential components of the global energy supply for decades to come. Implementing a policy that disproportionately targets a single sector undermines the competitiveness of Canadian industries. Such a policy forces an artificial phase-out through government intervention, disregarding market dynamics and international energy demands.

Not only that, but an industry-specific emissions cap demonstrates that Canada values certain emissions above others, creating another layer of uncertainty for investors outside of the energy industry. It sets a precedent that harms Canadian competitiveness across the board on a global scale.

[5] Indigenous equity and its growing role in Canadian energy and resource development. Heather Exner-Pirot, the Macdonald-Laurier Institute. December 2023.

Conclusion

For all the reasons above, and more, the negative repercussions of an emissions cap on the oil and gas sector would be severe, wide reaching, and felt across Canada for generations.

The industry agrees that emissions need to be reduced, and all companies are taking steps to do so. However, the emissions generated by oil and gas production do not outweigh the massive benefits that the industry brings to Canadian communities, the national economy, and global energy users.

Enserva and our members are committed to constructive dialogue and are available for further discussions to achieve our shared environmental and economic goals.

Sincerely,

Gurpreet Lail
President and CEO, Enserva

Ministre de l'Environnement et du Changement climatique

Minister of Environment and Climate Change

Ottawa, Canada K1A 0H3

JUL 0 8 2024

Mr. Michael W. Milani, K.C.
Chair
Economic Impact Assessment Tribunal
c/o Mr. Ken Dueck
Executive Director
eiat@gov.sk.ca

Dear Mr. Milani:

Thank you for your letter of May 28, 2024, requesting information related to economic analysis of the proposed Regulations Amending the *Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)*, as well as information related to economic analysis of the Proposed Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap.

The proposed oil and gas methane amendments would expand the scope of the existing regulations with a focus on maximizing reductions through achievable and cost-effective actions. Preliminary work supporting the proposed amendments estimates total incremental costs of $15.4 billion, while the benefits associated with greenhouse gas emissions reductions are valued at $27.8 billion (social benefit of avoided global damages from climate change). The monetized net benefits of the proposed amendments would be $12.4 billion, with an average cost of $71 per tonne of carbon dioxide equivalent. Compliance costs specific to Saskatchewan are estimated at $4.2 billion over a 13-year period (2027–2040). This information is included in the Regulatory Impact Analysis Statement (RIAS) for the draft amendments (*www.gazette.gc.ca/rp-pr/p1/2023/2023-12-16/html/reg3-eng.html*), which also describes the main assumptions underlying the estimates. My understanding is that technical discussions among Environment and Climate Change Canada and Government of Saskatchewan officials are ongoing, and that information related to modelling has been shared as part of those discussions.

…/2

If Saskatchewan decides to pursue an equivalency agreement with the federal government pursuant to authorities contained in the *Canadian Environmental Protection Act, 1999*, as it has done on two previous occasions in 2020 and 2024, and its regime meets the equivalency test, the Governor in Council may stand down the federal regulations in Saskatchewan for up to five years.

Reducing oil and gas sector methane emissions is one of the fastest and lowest-cost ways to combat climate change. Canada's actions on methane are consistent with emerging global measures to reduce methane from the oil and gas sector, including in the United States, Europe, China, and Brazil, as well as commitments of more than 50 of the world's major oil and gas companies to achieve near-zero methane emissions and zero routine flaring by 2030.

As you noted, the Government of Canada is also developing a regulated oil and gas emissions cap. That work is ongoing, and it is being informed by input received through extensive consultation with provinces, territories, Indigenous groups, stakeholders and the public. As with all federal regulations, the proposed and final regulations will be published in the *Canada Gazette* together with a detailed RIAS that outlines projected environmental and economic impacts.

The Government of Canada plans to publish proposed regulations for the oil and gas emissions cap later this year. The detailed information and modelling results you requested have not yet been completed given that they will need to be based on the actual regulatory design. That analysis will be published in the RIAS alongside the proposed regulations.

The Government of Canada will continue to take Saskatchewan's considerations into account as it works to draft oil and gas emissions cap regulations and finalize strengthened oil and gas methane regulations later this year.

Please accept my best regards.

Sincerely,

The Honourable Steven Guilbeault, P.C., M.P. (il/lui/he/him)

July 3, 2024

Mr. Michael W. Milani, K.C.
Chair, Economic Impact Assessment Tribunal
1100 1874 Scarth Street
Regina SK S4P 4B3

Via email (eiat@gov.sk.ca)

Dear Mr. Milani,

I am writing on behalf of the Explorers and Producers Association of Canada (EPAC) which represents more than 80 conventional upstream oil and gas producers who collectively produce most of the oil and natural gas resources in Saskatchewan and more than 40 per cent of Canada's oil and more than 65 per cent of the country's natural gas.

EPAC appreciates the opportunity to respond to the Economic Impact Assessment Tribunal (EIAT) and its request to participate in the tribunal's assessment of the proposed federal sectoral emissions cap for the oil and natural gas sector and the draft federal Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector).

EPAC is of the strong belief that the provinces, including Saskatchewan, are best placed to regulate all aspects of the oil and natural gas sector, including its greenhouse gas emissions. This is because the provinces own the resources, have the constitutional jurisdiction to regulate the sector, and have competent regulators with the required capacity to oversee the sector, deep technical knowledge of the industry, and embedded expertise with respect to its emissions. Saskatchewan has also demonstrated an ability to achieve deep emissions reductions from the sector through successful policies like the Output-Based Performance Standards (OBPS) and Oil and Gas Emissions Management Regulations (OGMER) at a substantially reduced economic cost to the sector as compared to federal carbon pricing and regulatory approaches.

According to the National Inventory Report, as reflected in Government of Saskatchewan reporting, overall emissions from the sector have fallen from 39.1 MtCO2e in 2015 to 27 MtCO2e in 2022. Furthermore, according to the latest annual OGMER report, methane emissions regulated under OGEMR have fallen from 10.9 MtCO2e in 2015 to 3.6 MtCO2e in 2023 – an incredible drop of two-thirds in just a few years. These data points serve as proof that federal intervention in the sector is unnecessary.

Sectoral Emissions Cap

EPAC has expressed significant opposition to the proposed federal emissions cap on the oil and natural gas sector in Canada because it will serve as a cap on production that results in shut-ins (contrary to public statements), represents a significant regulatory burden on top of several other regulations that are reducing emissions from the sector, is economically inefficient and unfair, is harmful to investment in the sector (including for efforts to decarbonize production), and is likely unconstitutional.

While there remain significant questions related to the proposed cap, as outlined in the Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap, it is clear the proposal as drafted represents a production cap on the sector at 2019 levels, limiting the ability of the provinces to regulate and develop their resources beyond the production scenario that has been used to develop the level of permissible emissions under the cap in 2030. In the case of Saskatchewan, it would prevent the province from meeting its ambition for production increases under the Saskatchewan Growth Plan.

The framework indicates that the emissions cap is set based on 2019 production levels and a requirement that all that production is fully abated at levels based on assumptions Environment and Climate Change Canada (ECCC) has made as to what is technically achievable by the sector in 2030. If ECCC is correct in its assumptions, industry cannot reduce emissions further than modeled and the policy explicitly limits production to 2019 levels. If ECCC is wrong in its technological assumptions, the production cap could be even lower than 2019 levels and shut-ins resulting from the policy will be even more severe.

While the framework contemplates some compliance flexibility for the sector, possibly up to 25 MtCo2e/yr, those compliance flexibilities would still cap production at levels assumed under the Canadian Energy Regulator's (CER's) Canadian Net-Zero (CNZ) Scenario. There is also no guarantee the proposed compliance flexibilities will be operational by 2030. As the CER admits in its Canadian Energy Future 2023, there are also several significant uncertainties built into the assumptions leading to the CNZ scenario which questions the accuracy and reliability of the scenario.

At this point, the proposed decarbonization fund represents nothing more than an additional carbon charge on top of existing charges under federal and provincial OBPSs. Robust and widely available domestic offsets are not currently available at the scale needed to achieve reductions of 25 MtCO2e/yr by 2030. ECCC has been slow to develop the required protocols, it is unclear what offsets might be acceptable under the proposed cap, and the offsets will presumably only be available for a single compliance obligation (i.e. under the emissions cap or an OBPS), limiting their value under the proposed policy. ITMOs under the Paris Agreement, while promising, are unlikely to be in place by 2030 given the reluctance of both Canada and its international partners to advance conversations around Article 6 of the accord.

The Explorers and Producers Association of Canada
L'Association des Explorateurs et Producteurs du Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

The net result is the proposed policy still represents a production cap that results in shut-ins even if the contemplated compliance flexibilities are in place by 2030 as those flexibilities will only be allowed up to the “legal upper bound” of the policy. If the expectation of the policy is that companies deploy all feasible abatement technologies to meet the emissions cap, they cannot grow production and the policy is in fact a production cap.

Furthermore, any production limit will not be felt uniformly across the sector. The conventional oil and natural gas sector, which composes the entirely of Saskatchewan’s current production, and which produces lower emissions intensity products, will be disadvantaged by the proposed policy and see a disproportionate share of shut-ins. This is because conventional oil and natural gas companies have higher sustaining capital needs and will be less able to compete for the purchase of credits under a constrained cap-and-trade system. The policy will therefore lead to a higher emissions intensity oil and natural gas sector with a substantial cost to Saskatchewan oil and natural gas companies and workers as well as the economy more broadly.

The prohibition of growth and likelihood of production shut-ins comprise the most significant cost to the sector and the province in the form of lost investment, lost revenues, and lost jobs. In addition, there would be unknown compliance and administrative costs on top of existing climate policies. While it is not possible for EPAC to model what these costs may entail given the existing level of detail related to the policy, EPAC remains at the disposal of the tribunal to provide any assistance or guidance that the tribunal would view as helpful to its work.

To further assist the tribunal in its work, I have included as an enclosure to this letter a copy of EPAC’s formal submission to the federal government on this file.

Draft Methane Regulations

While EPAC and its members are committed to further reductions in methane emissions from the sector, EPAC has expressed significant concerns with the current draft regulations and their potential to negatively impact production. Given the nature of Saskatchewan’s oil resources which have necessarily been developed through small, dispersed sites, many of which to not have access to take away capacity for associated natural gas, the province is likely to be disproportionately impacted by the draft regulations and the risk of potential shut-ins is greater in Saskatchewan than elsewhere in Western Canada.

In the Saskatchewan context, EPAC is particularly concerned by the potential for significant shut-ins if provisions require the replacement of the thousands of tanks across the province, as well as the high cost and low benefit of leak detection activities on the scale proposed in the draft regulations.

The Explorers and Producers Association of Canada
L’Association des Explorateurs et Producteurs du Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

EPAC has been working with the Ministry of Energy and Resources to provide advice and input as they seek to quantify these costs and risks and would be happy to discuss detailed specific matters with the tribunal as it sees fit.

While EPAC is working with ECCC in the hopes of improving the draft regulations to remove the production risks in Saskatchewan and elsewhere, it is EPAC's hope that Saskatchewan remains the sole regulator of the sector for the reasons articulated above.

I trust the information above to be informative to the efforts of the tribunal. EPAC remains at your disposal should you require any assistance to complete your important work.

Sincerely,

Chris Montgomery
Vice President, Policy
The Explorers and Producers Association of Canada

Encl.:

EPAC Submission – Federal Emissions Cap – January 2024

January 24, 2024

The Honourable Steven Guilbeault
Minister of Environment and Climate Change
200 boulevard Sacré-Cœur, 12e étage
Gatineau QC K1A 0H3

(via email: ministre-minister@ec.gc.ca and planpetrolieretgazier-oilandgasplan@ec.gc.ca)

RE: *A Regulatory Framework to Cap Oil and Gas Sector Greenhouse Gas Emissions*

Dear Minister Guilbeault,

I am writing on behalf of the Explorers and Producers Association of Canada (EPAC) which represents more than 100 upstream oil and natural gas producers that collectively produce more than 65 per cent of Canada's natural gas and more than 40 per cent of the country's oil. They employ tens of thousands of Canadians, attract billions of dollars in capital investment, and contribute billions of dollars in taxes and royalties to federal and provincial governments on an annual basis.

EPAC and its members remain committed to reducing greenhouse gas (GHG) emissions from the upstream oil and natural gas sector. In fact, emissions from the conventional oil and natural gas sector have been falling for several years now according to Environment and Climate Change Canada's (ECCC's) National Inventory Report (NIR).

However, **EPAC opposes the proposed sectoral emissions cap because it will serve as a cap on production that results in shut-ins (contrary to public statements), represents a significant regulatory burden on top of several other regulations that are reducing emissions from the sector, is economically inefficient and unfair, is harmful to investment in the sector (including for efforts to decarbonize production), and is likely unconstitutional.**

While EPAC is committed to actively participating in this round of engagement on the proposed policy, it is disappointed that its concerns have not been heard to date or reflected in the proposed framework.

Although it opposes the proposed emissions cap, EPAC and its members support the principle of carbon pricing and recognize the need for further action on methane. EPAC and its members further believe that it is possible to achieve deep decarbonization within the sector while continuing to provide the energy Canadians rely on and growing international exports to support our international allies and reduce global GHG emissions.

Proof that this is possible lies in actions occurring today. EPAC members, who already own or operate at least a portion of each of Canada's large-scale carbon capture, utilization and storage (CCUS) projects, are advancing additional CCUS projects. The conventional sector continues to electrify facilities where feasible and EPAC members are also actively investing in hydrogen projects, renewable energy, and new emissions reductions technologies. EPAC and its members will ensure that further emissions reductions from the conventional sector will be achieved.

Canada has long been a world leader in minimizing methane emissions from the oil and natural gas sector. This is due to the longstanding policies of the provinces that limit flaring, as well as more recent regulatory developments at the federal and provincial level. EPAC has also been mostly supportive of the Government of Canada and Government of Alberta's ambitious but realistic intent to reduce methane emissions from the sector by 75 per cent. Although EPAC believes the provinces should be the only regulators in this area, we are working constructively with your department to ensure draft methane regulations can achieve these reductions without impacting production. EPAC also continues to work with the provinces of British Columbia, Alberta, and Saskatchewan to build on the success of their existing and proposed regulations in the hopes that equivalency can be achieved.

Current Policy Environment

As has been pointed out by several prominent energy-focused Canadian economists such as Trevor Tombe and Andrew Leach, **the proposed policy is economically inefficient, undercuts the principles and objectives of carbon pricing, and treats emissions from one sector differently than others.**

The proposed policy instrument pancakes on to several other policies designed to reduce emissions from within the sector: carbon pricing as administered through the numerous federal and provincial output-based pricing systems (OBPSs) across the country, the fuel charge applied to any uncovered CO2 sources, and methane regulations, as well as applying to the oil and natural gas industry's Scope 2 emissions (primarily from electricity) which are covered by even further aggressive policies.

This pancaking of cost-based policies adds increasing complexity, a realized price of carbon that is different for each economic sector and that is significantly higher than needed for decarbonization to occur putting at risk the ability of Canadian industries to attract capital, employ Canadians and maintain the Canadian economy. In fact, **the very prospect of the proposed policy is having negative impacts on the ability of Canadian producers to attract foreign investment into Canada, including the crucial investment needed to reduce emissions, which harms the value of the Canadian dollar and the purchasing power of the Canadian economy.**

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

The situation is exacerbated by the inability of the Government of Canada to advance positive incentives that would encourage capital spending on large decarbonization projects. The CCUS investment tax credit (ITC), which was first announced nearly three years ago, has still not been legislated let alone implemented. Draft legislation on the Clean Electricity ITC, announced in Budget 2023, will not be public until this summer. And, while the availability of carbon contracts for difference (CCfDs) through the Canada Growth Fund will help a few projects, the recent Fall Economic Statement indicated that the Government of Canada is backing away from a broad-based program of CCfDs, which harms the ability of companies to attract needed capital for CCUS and other decarbonization projects.

Rather than layering on additional costs for industry and limiting production, **the Government of Canada should be focused on attracting capital to the Canadian economy that would support multi-million dollar, multi-decade decarbonization projects and working with the provinces to remove barriers to decarbonization.**

Impacts to Production

By selecting a cap-and-trade policy, ECCC has chosen a policy mechanism that, by its very nature, sets an upper bound on production and therefore serves as a production cap, limiting the ability of the provinces to regulate and develop their resources beyond the production scenario that has been used to develop the level of permissible emissions under the cap in 2030.

The framework indicates that the emissions cap is set based on 2019 production levels and a requirement that all that production is fully abated at levels based on assumptions ECCC has made as to what is technically achievable by the sector in 2030. If ECCC is correct in its assumptions, industry cannot reduce emissions further than modeled and the policy explicitly limits production to 2019 levels. In fact, this represents a required production cut given that production has increased since 2019. According to Statistics Canada, Canadian natural gas production for January 2019 was 16 bcf/d and rose to 18 bcf/d in August 2023, while oil production averaged 4.1 Mbbl/d in January 2019 and rose to 4.4 Mbbl/d in September 2023. If ECCC is wrong in its technological assumptions, the production cap could be even lower than 2019 levels and shut-ins resulting from the policy will be even more severe.

While the framework contemplates some compliance flexibility for the sector, possibly up to 25 MtCo2e/yr, those compliance flexibilities would still cap production at levels assumed under the Canadian Energy Regulator's (CER's) Canadian Net-Zero (CNZ) Scenario. Here it should be noted that natural gas production in August 2023 already exceeded the peak of 17.7 bcf/d projected by the CNZ Scenario.

There is also no guarantee the proposed compliance flexibilities will be operational by 2030. As the CER admits in its Canadian Energy Future 2023, there are also several significant uncertainties built into the assumptions leading to the CNZ scenario which questions the accuracy and reliability of the scenario.

At this point, the proposed decarbonization fund represents nothing more than an additional carbon charge on top of existing charges under federal and provincial OBPSs. Robust and widely available domestic offsets are not currently available at the scale needed to achieve reductions of 25 MtCO2e/yr by 2030. ECCC has been slow to develop the required protocols, it is unclear what offsets might be acceptable under the proposed cap, and the offsets will presumably only be available for a single compliance obligation (i.e. under the emissions cap or an OBPS), limiting their value under the proposed policy. ITMOs under the Paris Agreement, while promising, are unlikely to be in place by 2030 given the reluctance of both Canada and its international partners to advance conversations around Article 6 of the accord.

The net result is the proposed policy still represents a production cap that results in shut-ins even if the contemplated compliance flexibilities are in place by 2030 as those flexibilities will only be allowed up to the "legal upper bound" of the policy. If the expectation of the policy is that companies deploy all feasible abatement technologies to meet the emissions cap, they cannot grow production and the policy is in fact a production cap. This will have significant economic impacts on the Canadian economy – to GDP, productivity, balance of trade, purchasing power, and ultimately exacerbate Canadians' ongoing concerns of affordability.

Finally, as EPAC has previously communicated, any production limit will not be felt uniformly across the sector. The conventional oil and natural gas sector (which produces lower emissions intensity products, is already reducing emissions, attracts more capital and employs significantly more Canadians across a much greater geography than other subsectors) will be disadvantaged by the proposed policy and see a disproportionate share of shut-ins. Under a production cap, lower emitting conventional oil and natural gas wells will be shut in long before other forms of production. **The policy will therefore lead to a higher emissions intensity oil and natural gas sector** with a substantial cost to conventional oil and gas companies and workers as well as the Canadian economy more broadly.

Concerns with Instrument Choice

In addition to its concerns with a production cap, EPAC is concerned by several specific impacts of the proposed framework. Because of the complexities and interactions expressed below, **EPAC is doubtful that ECCC can draft a policy consistent with the proposed framework that meets the requirements of the Treasury Board's Policy on Regulatory Development**. Namely, the framework would seem to fail to meet the principles of evidence-based decision-making and support for a fair and competitive economy, since the evidence suggests the policy is a cap on production contrary to stated policy objectives, and the policy is clearly unfair to one economic sector and reduces the competitiveness of the Canadian economy.

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

It is likely also not possible to meet the regulatory analysis requirements of Section 7 of the Treasury Board Policy. In EPAC's view, the proposed response is not proportional, will unduly impact other areas of regulation and flies in the face of regulatory cooperation with the provinces. Given the inability to effectively model the proposed policy's interactions with provincial OBPSs and other climate policies, it is also highly unlikely that ECCC can produce a good-faith regulatory impact analysis statement. In fact, given the policy is meant to continue to be in place and evolve until at least 2050 but provides no details on the period from 2030-50, it is impossible to model the consequences of the full scope of the policy.

Given the cap on production and concerns expressed by Indigenous organizations such as the Indian Resource Council and the Indigenous Resource Network, the proposed policy would also seem to **impact Article 2 of UNDRIP and the right of Indigenous peoples to freely pursue their economic development and should therefore require full consultation across all impacted Indigenous nations and interests.**

Inclusion of Methane

EPAC has been generally aligned with ECCC on the need to further reduce methane from the upstream oil and natural gas industry and has agreed on the need to work towards the Government of Canada's goal of reducing those emissions by at least 75 per cent. While EPAC has expressed some concern with the draft methane regulations, it continues to be committed to working constructively with ECCC to achieve the government's desired outcome.

The inclusion of methane emissions in the proposed cap, however, adds significant administrative and compliance costs to the already meaningful regulatory burden contained in the draft regulations, which ECCC estimates to be in the range of $15 billion. **The inclusion of methane emissions in the cap will see no additional emissions reductions. It is simply adding costs onto the sector for the sake of adding on costs.**

Furthermore, methane emission within the sector are not equally distributed across commodities, companies or facilities. Therefore, the cap-and-trade system will see some companies subsidize others for emissions reductions that they are required to undertake through the methane regulations, further punishing some companies for complying with the regulations. Not only is this interaction economically inefficient, but it also distorts the very purpose of the cap-and-trade system and the methane regulations.

Interaction with federal and provincial Output-based Pricing Systems (OBPSs)

The proposed policy will have costly, but unknown implications for exiting OBPSs which are meant to price and drive down emissions from all trade-exposed industrial sectors. The policy will duplicate reporting and increase the compliance cost of every ton of emissions subject to both policies. It will also presumably compromise the ability of credit generation and purchases

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

available under provincially regulated OBPSs with unintended outcomes for Canadian industry beyond oil and gas. Apart from the direct cost implications to the oil and natural gas industry, the policy has a potential to impact the overall effectiveness and viability of OBPSs in British Columbia (currently under development), Alberta and Saskatchewan as the oil and natural gas industry represents the largest source of covered emissions in each of those provinces.

In addition, many elements of the proposed policy are identical to those of the provincially administered OBPSs – they each have government-determined free allocations, a price on carbon, the ability to generate and sell performance credits and use offsets, and both drive down emissions. The proposed policy however would seem to be designed to override the operations of the provincial OBPSs in ways ECCC cannot anticipate, unfairly isolate one sector from the rest of the industrial economy, and limit the production capacity of the same industry.

Given the complexities of the interactions, EPAC fails to see how ECCC could adequately model the implications of imposing a cap-and-trade system on top of existing OBPSs administered by the federal government and the provinces.

Inclusion of Scope 2 Emissions

Electrification of the conventional upstream oil and natural gas industry remains a key decarbonization pathway. However, **the inclusion of Scope 2 emissions as proposed in the policy would discourage the use of electricity to decarbonize the sector** by adding additional costs and making the oil and natural gas sector responsible for the emissions of electricity providers, which are beyond the control of the purchaser of electricity. The electricity sector already faces significant regulations by provinces, is subject to carbon pricing through OBPS, and is proposed to be regulated by the draft Clean Electricity Regulations. Adding an additional layer of regulation to emissions from electricity for one sector is unnecessary, costly, counter-productive, and unfair. The additional costs encourage production shut-ins rather than decarbonization, contrary to the stated goals of the policy.

In addition, CCUS projects, another significant decarbonization pathway for the sector, will require a significant amount of electricity in a highly decarbonized world. The additional cost and burden of including emissions from electricity providers will reduce extremely narrow profit margins of CCUS projects and remove the potential for decarbonization within the sector, contrary to the stated goals of the policy. **Adopting a further barrier to CCUS development in this manner will encourage production shut-ins rather than decarbonization of the sector.**

Inclusion of LNG

As stated in its September 2022 submission, EPAC does not believe LNG facilities should be included in any proposed emissions cap. The shipment of LNG from Canadian shores presents a unique opportunity for Canada to contribute to the energy security needs of our allies, reduce global GHG emissions, and provide significant economic growth domestically. Including LNG facilities, which will have limited abatement options once built, will further reduce allowable domestic production under the cap and the compliance costs associated with LNG facilities will either reduce the competitiveness of Canadian LNG or ensure costs are passed back to producers who will be held responsible for emissions that are beyond their control.

It should be noted that the CER CNZ Scenario which is used as the basis of the proposed policy does not account for all approved LNG facilities. In addition, the CER CNZ Scenario does not assume that natural gas production increases to correspond with new volumes associated with LNG facilities when they come online. This implies that nearly all production to support LNG development is assumed to be absorbed from current production rather than representing increased production. Therefore, the legal upper bounds set by the policy would see decreased domestic production for domestic uses, limiting supply and increasing costs to Canadian consumers who are already struggling with affordability issues.

There is also an inherent policy inconstancy requiring the inclusion of LNG within the cap when other infrastructure used in the transport and movement of oil and natural gas are excluded.

Constitutional Concerns

Considering recent court decisions limiting the powers of the Government of Canada to regulate GHG emissions and other environmental impacts, **EPAC is of the view that any regulations to operationalize the proposed framework would be unlikely to survive a court challenge.**

Furthermore, the provinces of Alberta and Saskatchewan have indicated they will explore all available legal options to prevent the operation of any laws or regulations from the federal government that impose an emissions cap on the oil and natural gas sector. This makes a court process challenging any regulations under the Canadian Environmental Protection Act (CEPA) inevitable.

Proceeding with the adoption and implementation of regulations will therefore lead to significant legal, policy and political uncertainties for industry in addition to the high compliance and administrative costs, limits on production and negative impacts to investment. These impacts will be for naught should the courts find the regulations to be, in whole or in part, unconstitutional.

Moving ahead with the policy without considering these provincial concerns also runs contrary to the Government of Canada's public commitment to work cooperatively with the provinces on climate related issues – which the Supreme Court of Canada (SCC) has advised is necessary.

Specifically, the framework raises the following legal complications:

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

Impacts to provincial jurisdiction

As outlined above, the proposed policy does represent a cap on production at some to-be-determined level. **The policy clearly impacts the ability of the provinces to manage and regulate the development of their oil and natural gas resources under Section 92A of the Constitution.**

Furthermore, in its judgments on *References re Greenhouse Gas Pollution Pricing Act, 2021*, and *Reference re Impact Assessment Act,* 2023, the SCC indicated that the Parliament of Canada does not have the ability to extend its jurisdiction to overstep that of the provinces for the sole purpose of regulating GHG emissions. Any such regulations must be in the proper bounds of the Constitution and tied to a federal head of power.

Ability to regulate GHG emissions of a given sector

In its judgment on the *References re Greenhouse Gas Pollution Pricing Act, 2021*, the SCC determined that the Parliament of Canada has the right to administer a uniform price on carbon across the Canadian economy under the Greenhouse Gas Pollution Pricing Act because the Government of Canada was able to show that the Act was properly tied to a federal head of power under the National Concern Doctrine.

However, the SCC made it clear that the decision was specific to the Act and not a broader determination on the ability of the Government of Canada to regulate GHG emissions. The decision explicitly states that the authorities under the Act are very different than a sector-by-sector regulatory approach to GHG emissions and suggests the SCC may look quite differently at sector-specific approaches in areas of provincial jurisdiction, which the proposed policy clearly represents.

Should the Government of Canada wish to argue the proposed policy is justified under the National Concern Doctrine, it would have to prove the provinces are unable to regulate in the narrow area of GHG emissions from the oil and natural gas sector and that the policy is not duplicative of provincial role.

On the first matter, the provinces clearly can regulate, and in fact are regulating, GHG emissions from the oil and natural gas sector through their OBPSs, as described above, and through provincial methane regulations. In fact, the federal government has accepted both sets of policies as being effective in the management of GHG emissions within the sector through formal recognition of these policies, and the NIR which shows emissions from the conventional oil and natural gas sector are falling.

The only difference at hand are the proposed federal provisions that would limit production of oil and natural gas, which clearly fail the second test above given that Section 92A of the Constitution give the provinces the exclusive jurisdiction over the development, conservation, and management of non-renewable natural resources.

Ability to regulate GHG emissions under CEPA

Jurisprudence also raises significant questions as to whether the federal government can regulate GHG emissions under the federal criminal power administered through CEPA. Using established tests as set out by the SCC, the Government of Canada would need to prove that the policy prohibits an activity through the imposition of a penalty for a valid criminal law purpose.

The proposed policy, however, does not prohibit any individuals from emitting GHG emissions. It applies to a small subset of GHG emitting entities, oil and natural gas producers, and does not prohibit or perhaps even limit emissions from individual companies. In substance, the policy is a regulatory scheme that prices emissions and limits the production of natural resources which are quite clearly in the jurisdiction of the provinces under Section 92A of the Constitution.

Furthermore, the jurisprudence would question whether carbon dioxide and methane emissions can be captured by CEPA in the first place. The SCC in *R. v Hydro-Québec* determined the only substances that can be prohibited under CEPA are those that are toxic in the common meaning of the word. While EPAC agrees that GHG emissions must be reduced from the sector, there is reasonable doubt as to whether the courts would classify carbon dioxide and methane emissions as toxic given, they are not in their nature toxic to humans or animals.

Recommendations

Because of the concerns and uncertainties articulated above, **EPAC recommends the Government of Canada not proceed with the proposed sectoral emissions cap**.

Should the Government of Canada wish to proceed with further developing the policy despite these concerns, **EPAC strongly recommends the Governor in Council exercise its discretion under Sections 53(1) and 53(2) of the Supreme Court Act to refer any proposed draft regulations under CEPA to the Supreme Court of Canada** for a determination of the important constitutional questions that will be raised by the provinces and other intervenors before the Court. Exercising this discretion would avoid the significant costs and uncertainties to industry, investors and governments associated withstanding up CEPA regulations that may not survive or be significantly affected by a challenge that will come before Court.

EPAC also recommends the Government of Canada fully consult on the proposed policy with impacted Indigenous Nations and business interests, consistent with its commitment to UNDRIP.

Finally, EPAC recommends the Government of Canada move quickly to implement its previously announced decarbonization incentives and work with industries across Canada towards a more coherent, balanced approach to climate policy that allows the Canadian economy to compete for the required capital and jobs to achieve large scale emissions reductions. A continued failure to balance market-based mechanisms and command and control regulations with incentives will see a further erosion of Canada's competitiveness harming the country's GDP and productivity.

EPAC would welcome the opportunity to further discuss its concerns regarding the proposed policy with you and others across the Government of Canada. Furthermore, EPAC welcomes the opportunity to continue to work constructively with you, your office, and your department on the implementation of climate policies that will decarbonize the sector in a way that does not negatively impact the production profile of the industry and the Canadian investment climate.

Should you wish to discuss these matters further, you may reach EPAC's Vice President Policy, Chris Montgomery, who is our lead on these files at chris.montgomery@explorersandproducers.ca.

Sincerely,

Tristan Goodman
President and CEO
The Explorers and Producers Association of Canada

CC:

The Right Honourable Justin Trudeau, P.C., M.P.
The Honourable Chrystia Freeland, P.C., M.P.
The Honourable Dominic LeBlanc, P.C., K.C., M.P.
The Honourable Mélanie Joly, P.C., M.P.
The Honourable Harjit Sajjan, P.C., O.M.M., M.S.M., C.D., M.P.
The Honourable François Phillipe-Champagne, P.C., M.P.
The Honourable Seamus O'Regan, P.C., M.P.
The Honourable Mary Ng, P.C., M.P.

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

The Honourable Johnathan Wilkinson, P.C., M.P.
The Honourable Anita Anand, P.C., M.P.
The Honourable Dan Vandal, P.C., M.P.
The Honourable Randy Boissonault, P.C., M.P.
The Honourable Gudie Hutchings, P.C., M.P.
The Honourable Gary Anandasangaree, P.C., M.P.
The Honourable Arif Virani, P.C., K.C., M.P.
Mr. Jean-François Tremblay
Mr. John Moffet
Mr. John Hannaford
Ms. Kaili Levesque
Mr. Paul Halucha
Mr. Chris Forbes
Ms. Tushara Williams
Mr. David Morrison
Mr. Dylan Jones
Mr. Simon Kennedy
Ms. Sandra Hassan
Mr. Rob Stewart
Mr. Michael Vandergrift
Mr. Graham Flack
Ms. Diane Gray
Mr. Paul Thompson
Ms. Catherine Blewett
Ms. Valerie Gideon
Ms. Shalene Curtis-Micallef
Mr. Jamie Kippen
Mr. Ben Chin
Mr. John Broadhead
Mr. Tony Maas
Mr. Andrew Bevan
Mr. Jamie Innes
Mr. Peter Wilkinson
Ms. Ashley Wright
Mr. Ian Foucher
Mr. Paul Moen
Mr. Kevin Coon
Ms. Claire Seaborn
Ms. Monique Lugli
Ms. Kathy Kettler
Mr. Elliot Lockington
Ms. Allie Chalke

Ms. Shaili Patel
Ms. Lisa Jorgenson
Mr. Chris Montgomery

L'Association des Explorateurs et Producteurs du Canada
The Explorers and Producers Association of Canada
Canadian Energy Solutions for Sustainable Prosperity™
Suite 1060, 717 7 Ave S.W., Calgary AB, T2P 0Z3 | www.explorersandproducers.ca

To Whom it May Concern,

Thank you for your letter dated May 28, 2024 regarding the Economic Impact Assessment Tribunal's request for a written submission on the federal Oil and Gas Sector Greenhouse Gas Emissions Cap (“the Cap") and the draft Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector) ("Methane 75").

As a brief introduction, Harvard Resources Inc. is a private company focused on petroleum and natural gas exploration and production. Harvard produces approximately 6,300 bopd in southeast Saskatchewan.

Harvard’s two main assets in southeast Saskatchewan are a 14% non-operated working interest in the Weyburn Unit and a 90% working interest and operatorship in the Tatagwa property located just west of the Weyburn Unit. Harvard’s production from the operated Tatagwa asset is approximately 3,300 bopd. Harvard has been a major contributor to the Saskatchewan economy over the past many years as we invest over $100 million in capital, operating costs, royalties, and Saskatchewan resource charge on an annual basis. In addition, we employ approximately 15 full-time individuals in Saskatchewan.

We appreciate the opportunity to provide you with our feedback on the impact the two federal initiatives (Cap and Methane 75) may have on Harvard.

The implementation of the Cap and Methane 75 will have significant negative effects on our company's operated production and on our investment levels. Harvard produces small amounts of solution gas with its oil production in the Tatagwa property. Most of the solution gas is gathered at the well sites and flowlined to the central batteries where it is flared as there is no natural gas infrastructure in the area.

If these regulations are implemented, production will be shut-in for the following reasons:

- There is no gas infrastructure available in the area to conserve the gas as there are no buyers or users of natural gas in the area.
- Other technologies to reduce these emissions are either not available or are not reliable.

Implementing these regulations will result in Harvard and other operators being forced to shut-in oil production as it will no longer be economic to produce the wells. This will have a significant negative impact on our economic contribution to the Provincial and Federal economies.

We would hope that our Provincial and Federal governments would consider a more balanced approach on emissions that considers both the environment and the economic stability of the industry. Regulators need to recognize that many different types of oil and gas operations exist in this province and one regulation does not fit everyone. Regulations need to be built around these differences in operations. Penalizing operators for emissions when there is **no solution** available to reduce these emissions is not an incentive to change operating procedures. It simply results in operators conceding and shutting in production.

We do encourage continued dialogue between the federal government, the Tribunal, and industry stakeholders to ensure that the regulations are reasonable and effective. If interested, we would welcome the opportunity to further explain to the Tribunal our operation and the challenges we face with additional emission regulations.

Thank you for allowing Harvard the opportunity to provide feedback on this important topic.

Sincerely,

Ken Frankiw
Chief Operating Officer
P: 403-716-1312
E: kfrankiw@harvardenergy.com

Submission to the Economic Impact Assessment Tribunal

June 3, 2024

On Behalf of Pemoco Ltd.

Pemoco is a small Canadian producer of oil in the Province of Saskatchewan. As a small oil company we operate about 500 oil wells and produce approximately 1500 barrels of oil per day. We drilled our first well in Saskatchewan in 1986 and have operated continually since then.

To give the Tribunal some idea of the impact of regulations on our business, when Pemoco began operating in SK in we were able to run our business with only 1 person dealing with filing reports and otherwise handling all the reporting required to government regulatory agencies. Today we have something like triple that amount. There are so many more things that require reporting on it is mind numbing.

Many of these reports deal with things associated with emissions and such issues coming from the climate change area. Although Premier Moe does not like the whole business of the carbon tax, he has government departments that are full of die-hard climate change bureaucrats. And these people like nothing more than making rules and regulations on emissions that require more and more technical efforts to report on these issues, as well as a lot more costly equipment in the field to record data. And these activities although they cost a lot do not add a cent to the bottom line in terms of additional revenues. They are completely negative.

The effects of Methane 75 and the Cap will add additional costs to our operation and will have a negative effect on our bottom line. As such we will have less funds to invest in new drilling to maintain our production. This will have a negative effect on the amount of money that the government of SK will have through the reduced crown royalties that they receive from us. I am afraid that I cannot put a number on this but it will be significant.

As a final point I have studied the science of climate change for years. If you study the real science as pursued by people like Dr. Lintzen from MIT you will find that CO_2 has had very little impact on the temperature that the earth experienced in the past and will have very little impact on the earth's temperature in the future. As a matter of interest the CO_2 concentration in the last ice ages could easily have been 10-20 times what it is now. Only by using climate change models which cannot replicate the real climate can anything even slightly harmful be determined. So in a sense climate change is mostly nonsense and should be treated as such.

Presented by Robert G. Niven, President.

July 25, 2024

Economic Impact Assessment Tribunal
Secretariat Office
100-1874 Scarth Street
Regina, SK, S4P 4B3

Via Email: *eiat@gov.sk.ca*

Attention: Mr. Ken Dueck, Executive Director

Dear Mr. Dueck,

RE: Clean Energy Regulations

Saskatchewan Association of Rural Municipalities ("SARM") represents its membership of rural municipal government in Saskatchewan and is the principal advocate in representing them before senior governments. As the voice for rural Saskatchewan for over 100 years, we have spoken strongly and clearly to represent rural Saskatchewan interests. SARM is grateful for the opportunity to review the Saskatchewan Economic Impact Assessment Tribunal's (the "Tribunal") review of the Federal Clean Energy Regulations ("CER") on behalf of our membership.

The CER has significant impacts on rural Saskatchewan. The anticipated 107% increase in utility rates by 2035 could impose a severe financial burden on our municipalities, businesses, and residents. This increase could create financial instability for municipalities, potentially leading to higher taxes or reduced services placing additional/unnecessary strain on municipal budgets.

These higher utility costs could lead to increased financial stress for residents, especially those with fixed or low incomes, raising the risk of utility disconnections and associated health and safety concerns. Local businesses, particularly those with energy-intensive operations, could face higher operational costs, potentially leading to downsizing or closures. This would reduce economic activity and increase the demand for social services due to affordability issues.

Agriculture and local businesses could also face additional financial hardships due to increased costs for electrifying agricultural equipment and higher energy bills. This will impact the sustainability and growth of these industries and lead to job losses and reduced economic activity in rural communities.

Similarly, the fertilizer industry, a vital component of our regional economy, will also be adversely affected by increased operational costs. This will hinder its ability to invest, innovate, and remain competitive on a global scale. SARM suggests ensuring realistic

2301 Windsor Park Road, Regina, SK S4V 3A4, 306-757-3577

flexibility and exemptions, and education on the environmental practices already being implemented in the Agricultural sector in Saskatchewan.

As outlined by the Tribunal, the transition to a low-emission electricity grid could require substantial infrastructure investments, with costs potentially reaching up to $1 billion per facility and a time frame of 5-10 years for successful adoption. While having access to clean, affordable, and reliable electricity is important to maintain competitiveness and achieve decarbonization goals, it is recommended that the CER be amended to include feasible and realistic flexibilities, exemptions, and extended timelines. A targeted and transparent assessment of the true costs and regional impacts would be also necessary, along with federal support for clean energy initiatives like Small Modular Reactors, cogeneration, and Carbon Capture Utilization and Storage.

The Tribunal's report highlights several concerns that align with our regional issues, including the risks and costs of regulatory changes, the short compliance timeline, the need for longer timelines and support for technology development, and the potential abandonment of existing infrastructure. Increased energy costs threaten the competitiveness of our resource-based economy and disproportionately affect rural communities, limiting economic development opportunities.

SARM believes that the work being completed by the Tribunal is imperative to ensure a viable and sustainable future for rural Saskatchewan. We look forward to reviewing the Tribunal's final report on the CER.

We ask that the Tribunal contact SARM directly if it has any questions or concerns pertaining to our submission.

Sincerely,

Ray OrB

Ray Orb
President of Saskatchewan Association of Rural Municipalities

Submission from the Saskatchewan Chamber of Commerce to the Economic Impact Assessment Tribunal on the Proposed Cap and Methane 75 Regulations

July 5, 2024

Overview

The Saskatchewan Chamber of Commerce (the Chamber) has heard from its membership affected by the federal *Oil and Gas Sector Greenhouse Gas Emissions Cap* (The "Cap") and the draft *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organize Compounds* ("Methane 75") It is the view of the Chamber that both the Cap and Methane 75 constitute duplicative and disruptive requirements upon businesses which do not provide a reasonable timeline for implementation. The result of their requirement in Saskatchewan would be a curtailing of oil and gas production, decline of innovation, and disincentivization of investment. Difference analyses have estimated the cost to the province would be billions of dollars in the coming years.

Background

While the vast majority of Canada's oil and gas production facilities are located in Alberta, Saskatchewan still maintains 27% of the country's remaining oil reserves - an estimated 3.7 billion barrels as estimated in December 2020[1]. These stores will be essential for maintaining the global economy as it transitions to net-zero, as simply "turning off the tap" is not a viable nor reasonable option at the current juncture. The Alberta government has already indicated that the federal government's proposed initiatives would cause severe detriment to its industry, and there is every indication that this would also be true for Saskatchewan. The Saskatchewan Ministry of Energy and Resources has estimated that compliance for the Cap and Methane 75 will cost the provincial energy sector between $7-9 billion dollars by 2030, but consultations with industry have indicated that this number may even be an underestimation.

Although the Chamber recognizes the need for emissions reduction across sectors, we are concerned by the duplicative nature of the Cap. Emissions from the upstream oil and gas sector are already regulated by the provincial government under the *Oil and Gas Emissions Management Regulations*, which came into effect January 1 of 2019, and according to the *2023 Oil and Gas Emissions Management Regulations Annual Report* Saskatchewan's upstream oil and gas sector continues to significantly reduce greenhouse gas (GHG) emissions, achieving a 67% reduction in 2023 levels compared to 2015. Producers have also shown a longstanding commitment towards reducing their environmental impact: greenhouse gas emissions from the conventional oil and gas sector across Canada fell by 24% while production grew by 21%[2]. Additional legislation would create administrative overhead without contributing positively to changes which are already underway, and would furthermore obfuscate the effects of these changes, making future impact assessments less accurate.

Issue

Our first point of concern is that neither the Cap, nor the Methane 75 regulations would provide a reasonable timeline of implementation for producers. Due to the nature of production in Saskatchewan (having a greater focus on oil than other jurisdictions), the remoteness of most facilities, and the lack of existing methane capture infrastructure, significantly more time would be required to make the necessary changes to petroleum infrastructure than has been allocated by these regulations. Oil and gas producers have indicated their willingness to comply with guidelines which do not significantly compromise their operations, and have proposed reasonable pathways for emissions reduction, even up to 75%, that are much less costly than the methods proposed by these federal regulations. Nevertheless, the federal government has chosen to move forward in spite of this information with a timeline that it has been informed is unreasonable and unattainable without significant economic losses.

Second, the Chamber is concerned by the potential for the Cap and Methane 75 initiatives to incentivise capital flight and carbon leakage to the United States. Canadian oil and gas producers already operate within a competitive international market in which demand for petroleum products is expected to persist for many years. Curtailing production here would only serve to drive it elsewhere. This is especially true for Saskatchewan - a jurisdiction with higher ethical and environmental standards than many other oil-producing regions in the world. The province's recent initiatives to attract investment would be effectively counteracted by the introduction of the Methane 75 and Cap regulations.

Third, the Chamber has also heard from industry leaders that the virtual elimination of methane venting required by Methane 75 constitutes an unreasonable request due to its severe impact to daily operations. Currently, when an operator needs to make repairs to a portion of pipe, they must seal off and then vent out the portion that they are working on. These regulations would require operators to capture and re-inject or re-use any methane that is vented from the pipes in this process, significantly increasing both the time needed for any repairs and the costs associated with them. In more remote areas, this requirement becomes even more burdensome, as the instruments necessary for capturing and storing vented methane would need to be transported long distances to be used for a relatively short period of time. The lack of existing methane capture infrastructure also puts Saskatchewan at a disadvantage in comparison to provinces such as British Columbia, who have previously focused more on natural gas extraction.

Fourth, there is also a need for greater coordination between Canada and the United States on any potential initiatives concerning the oil and gas industry. As many producers conduct operations on both sides of the Canada-US border, they will be subject to two different sets of regulations. It is imperative that the Canadian government consider this and do more to coordinate legislation with its American counterparts to ensure that an excessive regulatory regime is not levied upon one of our largest industries: petroleum, both crude and refined, is one of Canada's primary exports to the

United States. In 2023, the United States imported nearly 1.6 billion barrels of crude oil and petroleum products from Canada[3], making it essential for the continued economic prosperity of both countries. Additionally, care must be taken to ensure that there is cohesion between regulations concerning methane and other volatile organic compounds (VOCs) to ensure that compliance is not made unnecessarily complex.

Fifth, there is also the concern of limiting productivity within one of Canada's and Saskatchewan's most productive economic sectors during a time of productivity crisis. The Canadian economy is anticipated to slow in the next year due to a number of factors[4], and this downturn will need to be offset in some way in order to prevent a recession. The oil and gas sector stands as one of the best-positioned industries to help avoid this, but it will not be able to fulfill this role if its focus must abruptly shift to methane capture and offsetting regulatory and price uncertainty. Currently, the timeline for the Methane 75 and Cap regulations is not achievable without significant loss to productivity. Production of conventional heavy oil is expected to fall while companies shift focus to compliance under these new regulations, and Saskatchewan, being the second largest oil producer in Canada and the sixth largest in North America, will be hit harder than most. The economic consequences of this will be extensive and overwhelmingly negative.

As a final note, it should be taken into serious consideration that the ability for industry leaders to speak on these regulations has been significantly impeded by the passing of Bill C-59. The Chamber has heard from its membership that a number of organizations who were intending to make a submission to the Tribunal have decided against this out of an abundance of caution for what material they now make public. This can be expected to become a recurring issue in our province if industry experts are not able to confidently speak on the policies which impact their businesses. We have seen that a lack of consultation results in bad policy and we encourage the Saskatchewan government to be mindful of this as well. It is the hope of the Chamber that our submission will be taken with the utmost consideration by the Tribunal for what it means to our province's economic future.

Resources

[1]https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-saskatchewan.html?=undefined&wbdisable=true

[2]https://www.cbc.ca/news/canada/calgary/canadian-association-oil-gas-producers-conventional-emissions-1.6953533

[3]https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MTTIMUSCA1&f=M

[4]https://thoughtleadership.rbc.com/rate-cuts-wont-spur-immediate-rebound-in-canadas-economy/

Economic Impact Assessment Tribunal
Secretariat Office
1100 – 1874 Scarth Street
Regina, Canada S4P 4B3

Phone: 306-527-9106

May 28, 2024

Secure Energy
Allen Gransch
Email: agransch@secure-energy.com

Dear Allen Gransch,

The Saskatchewan First Act established the Economic Impact Assessment Tribunal (the "**Tribunal**") to conduct economic impact assessments of Government of Canada initiatives that may cause economic harm to Saskatchewan projects, operations, activities, industries, businesses, or residents.

In November, 2023 the Government of Saskatchewan referred the Government of Canada's proposed *Clean Electricity Regulations* to the Tribunal for assessment. The Tribunal has completed its report to the Saskatchewan Minister of Justice and Attorney General.

On April 8, 2024 two other federal initiatives were referred to the Tribunal – the federal Oil and Gas Sector Greenhouse Gas Emissions Cap (the "**Cap**") and the draft *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organize Compounds (Upstream Oil and Gas Sector)* ("**Methane 75**"). The Tribunal is seeking the input of organizations and businesses in key sectors of Saskatchewan's economy that may be impacted by these federal initiatives.

The Tribunal is interested in receiving a written submission from you in respect of these two initiatives including:

- How Methane 75 and the Cap may affect your company's production and investment levels;
- Insights on the technological feasibility of your company complying with these two federal policies;
- Insights on the financial viability of your company complying with these two federal policies; and,
- Any other matter of which you may wish to bring to the Tribunal's attention.

The Tribunal is also seeking submissions from a number of sector associations of which your company may be a member.

The Tribunal requests that your submission be submitted to the Tribunal Secretariat by no later than **July 5, 2024**. If you wish to make a submission but require additional time, please advise the Secretariat.

Written submissions to the Tribunal might be publicly posted when its final report is released. All documents provided to the Tribunal are considered to be public information unless expressly noted otherwise. The Tribunal may determine that receiving submissions on an in-camera or otherwise confidential basis is appropriate to protect third-party confidential business or other information. Additionally, subsection 6(1) of *The Saskatchewan First Regulations* requires that the Tribunal's reports be in a form appropriate for release to the public and comply with *The Freedom of Information and Protection of Privacy Act*.

The Tribunal retains the right to reject any document presented to it or to the Secretariat and is under no obligation to accept or review any particular document or information.

The Tribunal's Secretariat is the support unit for the Tribunal and is housed in the Ministry of Justice and Attorney General. Please deliver your submissions electronically to the Secretariat, as follows:

Executive Director Ken Dueck
Economic Impact Assessment Tribunal Secretariat
eiat@gov.sk.ca

Should you have any questions, please direct them to the Secretariat.

Sincerely,

Michael W. Milani, K.C.
Chair, Economic Impact Assessment Tribunal

cc:

Steel Reef Infrastructure Corp.
1600, 333 – 7th Avenue S.W.
Calgary, AB T2P 2Z1
P: 403.263.8333 | F: 403.237.9464

Sent via email: ken.dueck3@gov.sk.ca

Economic Impact Assessment Tribunal
Executive Director Ken Dueck
Secretariat Office
1100-1874 Scarth Street
Regina, Canada S4P 4B3

Attention: Ken Dueck, Executive Director

Re: Impact of the Federal Oil and Gas Sector Greenhouse Gas Emission Cap and Amendments to the Methane Regulations

Mr. Dueck,

Steel Reef would like to thank the Tribunal for the opportunity to provide comments on the impact of these two significant Federal government initiatives targeting Canada's oil and gas sector.

Steel Reef is a privately held western Canadian midstream company focused on the business of gathering, processing, transporting and storing oil, natural gas and other associated products in the Western Canadian Sedimentary Basin and Bakken resource play.

In recent months, a number of independent analyses have been conducted that assess the impact of the proposed federal cap on oil and gas emissions[1]. These studies produce surprisingly consistent results and can be highly informative to the Tribunal's deliberations. Generally, these analyses used conservative assumptions to build oil and gas production forecasts and made reasonable (if not optimistic) assumptions regarding expected emissions reductions in the sector (with or without the cap). In all these analyses it was concluded that the sector emissions reductions that could be reasonably expected through new investments (primarily methane reductions) and operational efficiencies would not be sufficient to meet the proposed federal cap (131-137 Mt of GHG emissions by 2030) and the sector would therefore require production cuts to achieve the necessary emissions reductions.

The magnitude of predicted oil and gas production cuts is dependent on the specific forecast scenario (and the associated assumptions) but, under a typical 'business as usual' scenario, it is generally believed the conventional oil and gas industry (not including oil sands) would need to curtail production by 0.6 - 0.1 million barrels of oil equivalent per day. The Deloitte analysis (which is generally more conservative) predicts Saskatchewan would need to reduce production by at least 10 per cent.

Recognizing the oil & gas industry is a key contributor to Canada's GDP, government revenues and labor market, the authors of these analyses evaluated the economic impacts associated with the reduced oil and gas production. Conservative predictions include:

- a 1.0 - 1.5% decline in Canada's Real GDP (decline of $25 - 40 billion),
- a $4.5 - 8 billion drop in federal government revenues ($7-12 billion drop in provincial/territorial revenues), and
- a 0.4 - 0.7% drop in national employment (90 – 157,000 jobs).

[1] Recent examples include ***The Conference Board of Canada: Economic Impacts of Greenhouse Gas Emissions Cap on the Oil and Gas Sector (January 2024)***, ***Deloitte LLP: Potential Economic Impact of the Proposed Federal Oil and Gas Emissions Cap (March 2024)***, and ***S&P Global: Economic Impact Assessment of Canadian Conventional Oil and Gas (May 2024)***

The Deloitte analysis suggests that Saskatchewan could see a 3.0% decline in Real GDP and the loss of 8500 jobs.

As a midstream oil and gas enterprise, Steel Reef's operations and growth plans will be negatively impacted by any reduction in production or overall industry activity and growth. The uncertainty associated with government policy and regulation can limit the growth of the upstream industry, severely impacting our ability to attract investment and execute growth plans.

This is also true for the federal government's proposed amendments to its Methane Regulations. As was the case with the original 2018 Regulation, the draft amendments continue to regulate aspects of the oil and gas sector in a highly detailed and prescriptive fashion that mirrors the responsibilities of the provincial regulator. This limits the ability of provincial regulators to develop a framework and regulatory requirements that are technically and economically optimal and that best reflect the unique characteristics of oil and gas resource development within their province. The uncertainty associated with this dual regulatory environment further impacts investor confidence and certainty, ultimately negatively impacting sector growth and our ability to attract investment.

Should you have any further questions, please do not hesitate to contact me.

Sincerely,

Scott Southward
President & CEO

1210, 396-11th Avenue S.W.
Calgary, Alberta T2R 0C5

TRILAND ENERGY INC.

Office: (403) 266-0010
Fax: (403) 532-8010

July 4, 2024

Without Prejudice **Delivered Via Email: eiat@gov.sk.ca**

Economic Impact Assessment Tribunal
Secretariat Office
1100 – 1874 Scarth Street
Regina, SK S4P 4B3

Attention: Executive Director Ken Dueck

Written Submission:

Economic Impact of The Federal Oil and Gas Sector Greenhouse Gas Emissions Cap (the "Cap") and the draft regulations amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organize Compounds ("Methane 75")

The Canadian government's Oil and Gas Sector Greenhouse Gas Emissions Cap (the "Cap") and the draft regulations amending the regulations Respecting Reduction in the Release of Methane and Certain Volatile Organize Compounds ("Methane 75") impose significant challenges and potential negative impacts on Triland Energy Inc. ("Triland") and other Saskatchewan Oil and Gas production companies. It will particularly affect company production levels, investment capabilities, technological feasibility, and financial viability within the province. Saskatchewan, known for its resource-rich environment and substantial oil and gas sector, faces unique economic and operational considerations under these stringent regulations.

Triland was incorporated in 2008 and is a small oil and gas producer operating out of South East Saskatchewan. Currently Triland produces approximately 1100 boe/day and significantly contributes to the Federal and Saskatchewan governments revenues. Historically, Saskatchewan has always been a welcoming province for small oil and gas producers. It has the type of basin where small, low capitalized companies can thrive. The ever-increasing restrictive policy environment threatens the viability of small companies in Canada.

Regulatory Landscape and Challenges

The emissions Cap and Methane 75 regulations are part of Canada's broader commitment to reducing greenhouse gas emissions in order to combat climate change. These regulations set ambitious targets for methane emission reductions from the oil and gas sector, aiming for a 75% reduction below 2012 levels by 2030. While these targets are crucial for environmental sustainability, they introduce substantial regulatory and operational burdens for Saskatchewan production companies.

2. **Operational Adaptation**: Small production companies in Saskatchewan may need to undergo significant operational changes to comply with Methane 75. This could include retrofitting existing equipment, upgrading production processes, training employees, and enhancing monitoring and reporting capabilities. Such adaptations require careful planning and investment, which may strain the technical and financial capacities of smaller operators.

3. **Technologies Investigated**: Triland has investigated different technologies to capture emissions in SE Saskatchewan. Within the constraints of the Output-Based Performance Standard Program (OBPS), Triland is eliminating the flaring of produced solution gas. Triland is fully supportive of the government's initiative to tie-in solution gas and eliminate flaring over the long-term. The key challenge to this objective is that there is no take away capacity in SE Saskatchewan and not enough infrastructure to tie-in production to a gas plant. The midstream companies have an oligopoly in the area and are exploiting the situation by charging plant operating costs similar to paying the carbon tax under the OBPS program. Despite the high operating costs, production companies are responsible for the full cost of the infrastructure to get the gas to the plant. This results in gas delivered with no return on investment.

   Triland has also looked at on-site power generation. Our analysis revealed considerable obstacles. SaskPower, a government agency, will not permit Triland to sell power across the government right of way. SaskPower's infrastructure also cannot handle the additional power on the grid. Gas liquids must be stripped from the gas in order to create power. These liquids can not be blended with the oil because oil shippers will not accept them. The shippers want to blend the oil internally to take advantage of the crude quality price uptick. Therefore, the liquids are disposed of which is a wasteful process.

   Power for bitcoin or greenhouses have also been investigated but neither option is economically viable due to the high cost of equipment required and low financial returns.

4. **Policy Result**: With the high cost of technology, increased overhead required to manage government reporting and the lack of infrastructure, Saskatchewan operators' budgets will be reallocated to managing emissions regulations rather than focusing on growth and remaining competitive. Companies will see a steady decline in revenues and potentially be driven out of the Saskatchewan market. The economics of this transition will be most impactful to small producers such as Triland.

Financial Viability

The financial viability of complying with the emissions Cap and Methane 75 regulations is a critical consideration for Saskatchewan production companies, particularly in the context of economic competitiveness and industry sustainability.

1. **Cost-Benefit Analysis**: Companies must conduct thorough cost-benefit analyses to assess the financial implications of compliance. The high costs associated with emissions reduction measures must be weighed against potential penalties for non-compliance and

reputational risks. For smaller companies operating on tighter margins, achieving a balance between regulatory compliance and financial sustainability is paramount.

2. **Investment Challenges**: The stringent regulatory environment will divert investment from Saskatchewan's oil and gas sector. Uncertainty surrounding compliance costs and regulatory stability reduces investor confidence and limits access to capital for new projects and expansions. This hinders the industry's ability to innovate, grow, and remain competitive in the global market and will reduce the Federal and Saskatchewan governments revenues used for social programs.

Conclusion

The Canadian government's emissions Cap and Methane 75 regulations present significant challenges for Saskatchewan production companies. The regulatory requirements impose operational constraints, increased compliance costs, and pose technological feasibility concerns, particularly for smaller operators. Addressing these challenges requires strategic planning, innovation, and collaboration within the industry to ensure sustainable development while maintaining economic competitiveness in Saskatchewan's oil and gas sector. The economic implications extend beyond individual companies to the broader Saskatchewan economy. The oil and gas sector is a significant contributor to provincial revenue, employment, and economic growth. Reduced production and investment levels due to compliance with the Cap and Methane 75 will have ripple effects across related industries, such as services and supply chains, likely leading to job losses and decreased economic activity in the province.

Should you have any questions in this regard, please do not hesitate to contact the undersigned at (403) 266-0010 or email brett.borgland@trilandenergy.com.

Yours very truly,

TRILAND ENERGY INC.

Brett Borgland,
President & CEO

August 16, 2024

Ken Dueck, Executive Director
Economic Impact Assessment Tribunal Secretariat
Ministry of Justice and Attorney General
1100 – 1874 Scarth Street
Regina, SK S4P 4B3

Delivered via e-mail to eiat@gov.sk.ca

RE: Tribunal assessment of the federal *Oil and Gas Sector Greenhouse Gas Emissions Cap* and the draft *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds*

Whitecap Resources ("Whitecap") appreciates the opportunity to provide input to Saskatchewan's Economic Impact Assessment Tribunal (the "Tribunal") regarding Environment and Climate Change Canada's ("ECCC") *Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap* ("Cap") and the draft *Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)* ("Methane 75").

Whitecap is an upstream oil and gas producer with assets across all three western provinces. In Saskatchewan, our operations extend throughout the Kindersley, Swift Current and Estevan production areas. Members of our team have engaged productively with the Ministry of Environment and Ministry of Energy and Resources over the past decade to support the design and implementation of effective and efficient regulations to reduce greenhouse gas emissions, such as the *Oil and Gas Emissions Management Regulations*, *Directive PNG036: Venting and Flaring Requirements*, and the *Management and Reduction of Greenhouse Gases Regulations*.

We respect and recognize the importance of our industry continuing its efforts to reduce greenhouse gas emissions. We believe it is possible for our sector to make even deeper reductions while providing the energy that Canadian's rely on, growing international energy exports to support our allies' energy security and reducing global GHG emissions. Our sector also has decades of experience in carbon capture, utilization and storage ("CCUS"), a critical component for achieving stated global emission reduction ambitions and is leveraging that expertise for the benefit of all. Whitecap is proud to actively participate in multiple operating and approved carbon capture and storage projects across western Canada.

Below is Whitecap's input to the topics referenced in the letter to Whitecap from the Tribunal dated May 28, 2024.

How Methane 75 and the Cap may affect your company's production and investment levels.

<u>Methane 75</u>

As of the date of this letter, ECCC is currently reviewing feedback provided by stakeholders to its draft Methane 75 and considering improvements. Following the publication of the final version of Methane 75, the provinces will have the opportunity to develop equivalent regulations which the oil and gas industry will be subject to.

3800, 525 – 8th Avenue SW
Calgary, AB T2P 1G1
Direct: (403) 266.0767
Emergency: (866) 590.5289

Based on current information regarding Methane 75, our capital and operational expenditures will increase to comply with the proposed regulatory requirements. Existing assets, of which Whitecap operates thousands in Saskatchewan, will require upgrades to replace or retrofit equipment and processes which currently vent small volumes of natural gas during normal operation. These include, though are not limited to, liquid storage tanks, reciprocating compressor packing seals, pneumatic instruments and pumps, and glycol dehydrators. Annual operating expenses are expected to increase due to higher carbon costs incurred for the combustion of the natural gas that will no longer be vented. In geographical regions with limited or no gas conservation infrastructure, the captured natural gas will be combusted in a flare, incinerator, enclosed combustor, or for fuel. The proposed requirements to conduct fugitive emission surveys and screenings will also significantly increase annual operating costs compared to current expenditures to meet provincial fugitive emission requirements.

New sites and facilities will require higher development costs to meet more stringent and costly design standards that reduce the potential to vent natural gas to the greatest extent possible. We expect these costs will be highest in Saskatchewan regions with limited gas infrastructure.

Depending on the requirements within the final version of Methane 75, and how the equivalent provincial regulations are designed, it is likely the increased limits pertaining to venting natural gas will accelerate the end-of-life for older assets and reduce development activity in some geographical areas.

The additional investment requirements described above will reduce the capital available for other investments which would provide a greater economic impact to Whitecap, local communities and the province of Saskatchewan. Further development in areas with limited gas conservation infrastructure may be reduced, with capital directed to investment to other areas, potentially outside Saskatchewan.

<u>Emissions Cap</u>

Whitecap believes the Cap will serve as a cap on production that will result in premature production shut-ins, represents a significant regulatory burden on top of several other regulations that are already effectively reducing emissions from our sector, is economically inefficient and unfair, and is harming investment in our sector and our country, including our efforts to further fund decarbonization. The spectre of an emissions cap on our sector alone is seen by our financial and economic partners as a production cap and will starve Canada's critical energy sector of future investment.

The framework indicates the sectoral emissions limit is based on 2019 production levels and a requirement that all production is fully abated to the degree ECCC has assumed is, or will be, technically achievable by 2030. If ECCC is correct in its assumptions, our sector cannot reduce emissions further than modelled and the policy explicitly limits production to 2019 levels. Based on current production levels, this indicates a production cut would be necessary given that production has increased since 2019.

While the framework contemplates some compliance flexibility, possibly up to 25 MtCO2e/yr, it would still cap production at levels assumed under the Canadian Energy Regulator's *Canadian Net Zero Scenario*. It should be noted that Western Canadian natural gas production in August 2023 already exceeded the peak of 17.7 bcf/d projected within the scenario. Compliance flexibility for the sector is an unfair mechanism to correct flaws in the framework, as it would most certainly result in the federal government selecting winners and losers across sector participants. Existing carbon markets, with appropriate stringency, have already demonstrated that emissions can be reduced in an environment where all participants play by the known market rules.

The inclusion of methane emissions in the proposed Cap adds significant administrative and compliance costs to an already meaningful regulatory and financial burden contained in the draft Methane 75. This inclusion is unlikely to result in additional emission reductions; the layering of more costs may only result in fewer GHG reductions as there will be less capital available for emissions projects.

The inclusion of scope 2 emissions as proposed would discourage the use of electricity to decarbonize our operations by adding additional costs and making us responsible for the emissions of our electricity providers, which are beyond our control. The electricity sector already faces significant regulation by the provinces, is subject to carbon pricing through the OBPS, and is proposed to be further regulated by the draft federal *Clean Electricity Regulations*.

Whitecap is a key partner in many carbon storage projects announced to date and the imposition of the proposed Cap will put those projects at significant risk of advancing. Projects like the two we currently operate and those under development, require significant amounts of electricity to inject carbon dioxide deep underground. The additional cost and burden of including the emissions associated with generating this electricity will constrict the already narrow financial margins of these projects, limiting or removing the potential to support significant decarbonization efforts in other sectors of the economy.

Insights on the technological feasibility of your company complying with these two federal policies.

Whitecap understands that methane limits proposed by ECCC are done so based on being technologically achievable; that technology currently exists that allow for them to be met. If this is true, the most significant hurdle is whether the implementation of the technology is economically viable, or if it would result in prematurely decommissioning assets. Depending on the severity of this outcome, the negative impact could be widespread, including royalties to the provincial government, economic activity in local communities, and increased asset abandonment requirements.

An additional significant hurdle pertains to the availability of technology that will be deployed to comply with more stringent regulations and the human resources to install it. The draft Methane 75 would provide a short timeframe for companies to upgrade existing assets, and competition for the equipment and labour required to complete the upgrades will be high.

There is also the potential for emissions from specific abatement projects to exceed those from the vented natural gas.

Insights on the financial viability of your company complying with these two federal policies.

While Methane 75 will significantly increase our operating and development costs, depending on the final regulatory design, Whitecap does not anticipate it will impact the company's financial viability (i.e. place the company under financial duress). Although, it will reduce the effectiveness of our capital and likely alter where it is deployed.

As stated previously, there isn't enough detailed information available regarding the design of the Cap to assess the degree to which it will affect Whitecap's financial viability, though we are confident it will place significant financial burden on our company and result in premature decommissioning of viable assets that would continue to provide economic benefits otherwise. Given the Cap is meant to be in place and evolve until at least 2050, yet provides no information on the period beyond 2030, it is impossible to assess the potential consequences of the full scope of the policy.

Any other matter of which you may wish to bring to the Tribunal's attention.

It is critically important the Saskatchewan government continues to engage with ECCC to ensure the province maintains equivalency with the federal methane regulations. It is in best interest of the province and its oil and gas industry to maintain provincial jurisdiction in this space to limit the economic impact to the degree possible by creating regulations that address the unique considerations of the sector in the province.

The proposed Cap will have costly, though unknown implications for existing OBPS programs, which are designed to reduce emissions from all trade-exposed industrial sectors using a carbon price. The policy will duplicate reporting and increase the compliance cost for every tonne of GHG emissions subject to both policies. It will also presumably compromise credit generation and purchases of credits under provincially regulated OBPSs with unintended outcomes for Canadian industries beyond oil and gas. In addition to the direct cost implications to our sector, the policy has the potential to impact the overall effectiveness and viability of OBPSs in British Columbia, Alberta and Saskatchewan as the oil and natural gas industry represents the largest source of covered emissions in each of those provinces.

Many elements of the Cap are currently present in the provincially administered OBPS programs: government-determined free allocations, price on carbon, ability to generate, sell and use performance credits and offsets, and reduce industrial GHG emissions. As proposed, this framework appears to override the operations of the provincial OBPSs in ways ECCC cannot anticipate and unfairly isolate one sector from the rest of the industrial economy.

We welcome the opportunity to further discuss our concerns and the potential impact of these policies with you.

Yours truly,

WHITECAP RESOURCES INC.

Mike Nerbas

Vice President, Health, Safety & Environment

cc: Grant Fagerheim, President & CEO

Patrick Kitchin, Director, Regulatory & Environmental Sustainability

WOODLAND
DEVELOPMENT CORP.

Suite 600, 322 11th Ave SW | Calgary, AB, Canada | T2R 0C5

July 18, 2024

Without Prejudice **Delivered Via Email:** eiat@gov.sk.ca

Economic Impact Assessment Tribunal
Secretariat Office
1100 – 1874 Scarth Street
Regina, SK S4P 4B3

Attention: Executive Director Ken Dueck

The Canadian Government's Oil and Gas Sector Greenhouse Gas Emissions Cap (**the Emissions Cap**) and the draft regulations amending the regulations Respecting Reduction in the Release of Methane and Certain Volatile Organize Compounds (**Methane 75**) are two proposed regulations that will have wide reaching implications on the small cap energy producers of Saskatchewan. Woodland Development Corp. (**WDC** or **the Company**) is a small, approximately 6,000 BOE/D, producer in the Southeast Saskatchewan region. WDC employs roughly 50 people in the field and utilizes the services of countless others. The majority of shareholders are Saskatchewan based. The Company spends 100% of it's capital in Saskatchewan and is a large part of the local community.

Currently, the Saskatchewan Government has an Output-Based Performance Standards (**OBPS**) program to regulate flaring in upstream oil and gas operations and the generation of greenhouse gases from stationary fuel combustion. This program has set aggressive reduction targets for operators that are aligned with the Provincial and Federal Government's mandates to reduce greenhouse gas emissions. Additionally, there is the Oil and Gas Emissions Management Regulations (**OGEMR**) program to regulate and reduce natural gas venting in upstream operations. The goal of both these programs is to reduce greenhouse gas emissions and to effectively reward companies for conserving their gas through carbon credits and taxing those that fall short of their baselines. Additionally, there is the Enhanced Production Audit Program (**EPAP**) to effectively monitor and audit production, measurement, and reporting practices.

We feel that the Saskatchewan Government has built a comprehensive emissions reduction strategy that has resulted in meaningful emissions reductions in upstream operations, on both an intensity and absolute basis. WDC also feels that adding more regulation will be a detriment to the Company and the industry. Currently, these programs and the reporting associated with them takes a great deal of time, effort, and investment. Adding more rigorous monitoring systems will effectively reduce the amount of time and capital available to develop our assets and focus on growth, ultimately having a negative impact on staff levels, production volumes and government revenues.

In summary, the Saskatchewan Government has effective greenhouse gas emission programs currently in place. These programs took time to implement and refine. Adding the Emissions Cap and Methane 75 would add confusion and redundancy that is not needed. Woodland Development Corp believes the programs that are in place are sufficient to reduce greenhouse gases in a meaningful way and this is verified by the energy sector reducing greenhouse gas emissions last year by 67% below levels reported in 2015.

Should there be any questions or comments in this regard, please contact myself at rwillson@woodlanddc.com or 587.582.0889.

Kind Regards,

Woodland Development Corp.

Rob Willson
President & CEO

SCHEDULE 2
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

LIST OF ENTITIES WHO RECEIVED AN INVITATION TO MAKE A SUBMISSION TO THE TRIBUNAL

Invitation Letters Sent – May 29, 2024

1. 2094495 Alberta Corp.
2. 7 Energy Ltd.
3. Adonai Resources Ii Corporation
4. Aldon Oils Ltd.
5. Anjarl Energy (Canada) Ltd.
6. Anova Resources Inc.
7. Arruga Resources Ltd.
8. Athena Resources Ltd.
9. Avalon Oil & Gas Ltd.
10. Axial Exploration Ltd.
11. Barrel Oil Corp.
12. Battlefords and Districts Chamber of Commerce
13. Baytex Energy Ltd.
14. Bluebird Resources Ltd.
15. Bonterra Energy Corp.
16. Burgess Creek Exploration Inc.
17. Canadian Association Of Energy Contractors
18. Canadian Association Of Petroleum Producers
19. Canadian Natural Resources Limited
20. Can-Expo Energy Inc.
21. Caprice Resources Ltd.
22. Cardinal Energy Ltd.
23. Cenovus Energy Inc.
24. Courser Energy Ltd.
25. Crescent Point Energy Corp.
26. Crewd Oil & Gas Inc.
27. Croverro Energy Ltd.
28. Dark Eye Energy Inc.
29. Dawn Energy Inc.

30. Durham Creek Energy Ltd.
31. Enbridge Inc.
32. End Game Exploration Inc.
33. Enhance Energy Inc.
34. Enserva
35. Epping Energy Inc.
36. Estevan Chamber of Commence
37. Eyehill Creek Exploration Ltd.
38. Fallon Energy Inc.
39. Federated Cooperatives Limited
40. Federation of Sovereign Indigenous Nations
41. Fortitude Resources Inc.
42. Gear Energy Ltd.
43. Gibson Energy
44. Greater Saskatoon Chamber of Commerce
45. Griffon Partners Operation Corp.
46. Harvard Resources Inc.
47. Hospitality Saskatchewan
48. Hummingbird Energy Inc.
49. Integrity Oil Operations Ltd.
50. Interpipeline
51. Invico Energy Ltd.
52. Ipc Canada Ltd.
53. Ish Energy Ltd.
54. Jarrod Oils Ltd.
55. Jedi Exploration And Development Inc.
56. Kindersley and District Chamber of Commerce
57. Kingston Midstream
58. Lakeview Energy Inc.
59. Lloydminster Chamber of Commerce
60. Longhorn Oil & Gas Ltd.
61. Longshore Resources Ltd.

62. Lycos Energy Inc.
63. Maple Creek chamber of commerce
64. Marlin Resources Ltd.
65. Metis Nations Saskatchewan
66. Midale Petroleums Ltd.
67. Novacor Exploration Ltd.
68. Novus Energy Inc.
69. Onion Lake Creek Nation
70. Ontic Energy Inc.
71. Original Oil Inc.
72. Pemoco Ltd.
73. Plains Midstream
74. Potts Petroleum Inc.
75. Prairie Star Resources Inc.
76. Prairie Thunder Resources Ltd.
77. Primal Resources Ltd.
78. Questerre Energy Corporation
79. Regina and District Chamber of Commerce
80. Revitalize Energy Inc.
81. Revolution Oil & Gas Corporation
82. Richelhoff Resources Inc.
83. Rocky River Petroleum Corp.
84. Rok Resources Inc.
85. San Tan Resources Ltd.
86. Saskatchewan Association Of Rural Municipalities
87. Saskatchewan Chamber of Commerce
88. Saskatchewan First Nations Natural Resource
89. Saskatchewan Headquartered Oil Producers
90. Saskatchewan Urban Municipalities Association
91. Saturn Oil & Gas Inc.
92. Secure Energy
93. Shaunavon Chamber of Commerce

94. Snake Oil Resources Ltd.
95. Sojourn Energy Inc.
96. Spectrum Resource Group Inc.
97. Steel Reef Infrastructure Corp
98. Stoughton Chamber of Commerce
99. Strathcona Resources Ltd.
100. Sun Century Petroleum Corporation
101. Superb Operating Company Ltd.
102. Surge Energy Inc.
103. Swift Current Chamber of Commerce
104. Taku Gas Limited
105. Talls-Tar Energy Limited
106. Tama Petroleum Ltd.
107. Taprock Energy Inc.
108. Teine Energy Ltd.
109. Tetonka Resources Inc.
110. The Explorers And Producers Association Of Canada
111. Titan West Energy Inc.
112. Triland Energy Inc.
113. Tundra Oil & Gas Limited
114. Valleyview Petroleums Ltd.
115. Valor Energy Ltd.
116. Veradon Energy Corp.
117. Vermilion Energy Inc.
118. Villanova Energy Inc.
119. Vital Energy Inc.
120. Volk Energy Corporation
121. West Lake Energy Corp.
122. Weyburn Chamber of Commerce
123. White Bear First Nation
124. Whitecap Resources Inc.
125. Woodland Development Corp.

Federal Invitation Letters Sent – December 28, 2023

1. The Honourable Steven Guilbeault, P.C., M.P.

SCHEDULE 3
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

NAVIUS RESEARCH INC. - A STUDY TO REVIEW THE ECONOMIC IMPACT OF THE OIL AND GAS SECTOR GREENHOUSE GAS EMISSIONS CAP AND ENHANCED OIL AND GAS METHANE REGULATIONS ON SASKATCHEWAN DATED AUGUST 13, 2024

A Study to Review the Economic Impact of the *Oil and Gas Sector Greenhouse Gas Emissions Cap* and *Enhanced Oil and Gas Methane Regulations* on Saskatchewan

Study Report Final Draft

SUBMITTED TO

Economic Impact Assessment Tribunal

August 8, 2024

Updated: August 13, 2024

SUBMITTED BY

Navius Research Inc.

Box 48300 Bentall

Vancouver BC V7X 1A1

Contents

Executive Summary 4

Approach 4

Impact analysis 7

Emissions abatement 8

Oil and gas economics 10

Provincial economy 13

Key insights 17

1. Introduction 19

2. Analytical approach 21

2.1. Calibration 22

2.2. Policy scenarios 24

2.2.1. Oil and gas sector policy design 26

2.2.2. Sensitivity analysis 31

2.2.3. Analysis caveats and limitations 32

3. Impact analysis 34

3.1. Emissions abatement 35

3.1.1. Overview 35

3.1.2. Process emissions 38

3.1.3. Combustion emissions 40

3.2. Oil and gas economics 43

3.2.1. Compliance costs 43

3.2.2. Production 46

3.2.3. Investment 50

3.2.4. Employment 51

3.3. Provincial economy 52

3.3.1. Government revenue 52

3.3.2. Macroeconomy 55

4. Key insights 59

Appendix A: Legislated federal and provincial policies 61

Federal policies 61

Saskatchewan policies 67

Other provincial policies 68
Appendix B: Technoeconomic assumptions 75
Methane abatement technologies 75
Carbon capture and storage 80
Industrial heat and cogeneration 81
Oil sands extraction technology 82
Electricity generation 82
Hydrogen production and applications 83
Direct Air Capture 84
Enhanced oil recovery 85
Emissions intensities in oil and gas sectors 86
Crude oil and bitumen upgrading production break-even prices 86

Executive Summary

In 2023, *The Saskatchewan First Act* established the Economic Impact Assessment Tribunal (EIAT) to conduct economic impact assessments of Government of Canada initiatives that may cause harm to Saskatchewan projects, operations, activities, industries, businesses, or residents.

This study report was requested by the EIAT to examine the economic impacts of the proposed *Oil and Gas Sector Greenhouse Gas Emissions Cap* (Emissions Cap) and *Enhanced Oil and Gas Methane Regulations* (Methane 75) in Saskatchewan between 2025 and 2050.

This report presents Navius' quantitative analysis of the Emissions cap and Methane 75, which uses its gTech-IESD model with model customizations that represent the unique elements of Saskatchewan's economy.

Approach

The gTech-IESD modelling suite was used to produce this analysis. This model's key features include an exhaustive accounting of Canada's macroeconomy, technology choice decision-making, hourly dispatch of electricity, and electricity system capacity expansion. More information about the model is available on our website.

The model version used for this analysis was customized to represent the unique elements of Saskatchewan's energy sector, including splitting the sector into five primary oil production types and improving the characterization of methane compliance.

Three policy scenarios were modelled in this analysis:

- Current Policy: This policy scenario consists of legislated policies at the federal and provincial level. This scenario serves as the policy counterfactual.
- Methane 75: This policy scenario implements Methane 75 in addition to Current Policy.
- Emissions Cap: This policy scenario includes Methane 75 and the Oil and Gas Emissions Cap in addition to Current Policy.

Table 1 below summarizes key assumptions used in these scenarios. More information on policies simulated in this analysis is available in Appendix A.

Table 1: Key policy assumptions

Policy area	Current Policy	Methane 75	Emissions Cap
Carbon pricing	The federal carbon pricing backstop rises by \$15/tCO_2e per year to \$170/tCO_2e in 2030, in real terms, with the Output-Based Pricing System (OBPS) in place		
Other legislated policies	Federal Investment Tax Credits, Clean Fuel Regulations, ZEV Mandate, etc. Implemented as per Appendix A		
Clean Electricity Regulations	Not implemented		
Oil and Gas Methane Policy	OGEMR[1] and Directive PNG036[2] only	OGEMR and Directive PNG036 in 2025; Methane 75 in 2030 onwards	
Oil and Gas Emissions Cap	Not implemented		Implemented as per Navius' interpretation of the December 2023 Regulatory Framework

A sensitivity analysis was also completed to account for future uncertainty of key parameters. Uncertain parameters include commodity prices, abatement technology costs, and abatement technology availability.

Table 2 below summarizes the set of sensitivities and key parameters under the Reference Case sensitivity. More information on technology costs is available in Appendix B.

[2] Government of Saskatchewan (2024). The Oil and Gas Emissions Management Regulations. Available from: https://publications.saskatchewan.ca/api/v1/products/92804/formats/109853/download

[2] Government of Saskatchewan (2024). Venting and Flaring Requirements: Directive PNG036. Available from: https://publications.saskatchewan.ca/api/v1/products/103751/formats/115120/download

Table 2: Sensitivity analysis

Parameter	Sensitivity range	Reference Case
Oil and natural gas prices	1. GoS Budget 2024/2025 $65-70 per barrel, 2030-2050 (West Texas Intermediate (WTI) $2022 US) 2. Canada Energy Regulator 2023 Canada Net-Zero $58-62 per barrel, 2030-2050	GoS Budget 2024/2025 $65-70 per barrel, 2030-2050 (WTI $2022 US)
Abatement technology costs	1. Navius reference costs for technologies, including Carbon capture and storage (CCS) 2. As per 1, with high CCS, hydrogen and Small modular nuclear reactor (SMnR) costs 3. As per 1, with low CCS, hydrogen and SMnR costs	Navius reference costs for technologies, including CCS
CCS and SMnR availability	1. CCS is available in Steam Assisted Gravity Drainage (SAGD), oil sands and upgrading sectors; SMnRs are available for cogeneration 2. CCS is unavailable in all upstream oil and gas sectors; all SMnR technologies are unavailable	CCS is available in SAGD, oil sands and upgrading sectors; SMnRs are available for cogeneration
Direct Air Capture (DAC) availability	1. DAC is not available 2. DAC is available and can participate in the Emissions Cap cap-and-trade market, using Navius' high DAC cost assumptions	DAC is not available

Results presented in this report refer to the Reference Case, unless specified otherwise. Results presented as a range refer to the range of possible outcomes under the set of sensitivities.

Impact analysis

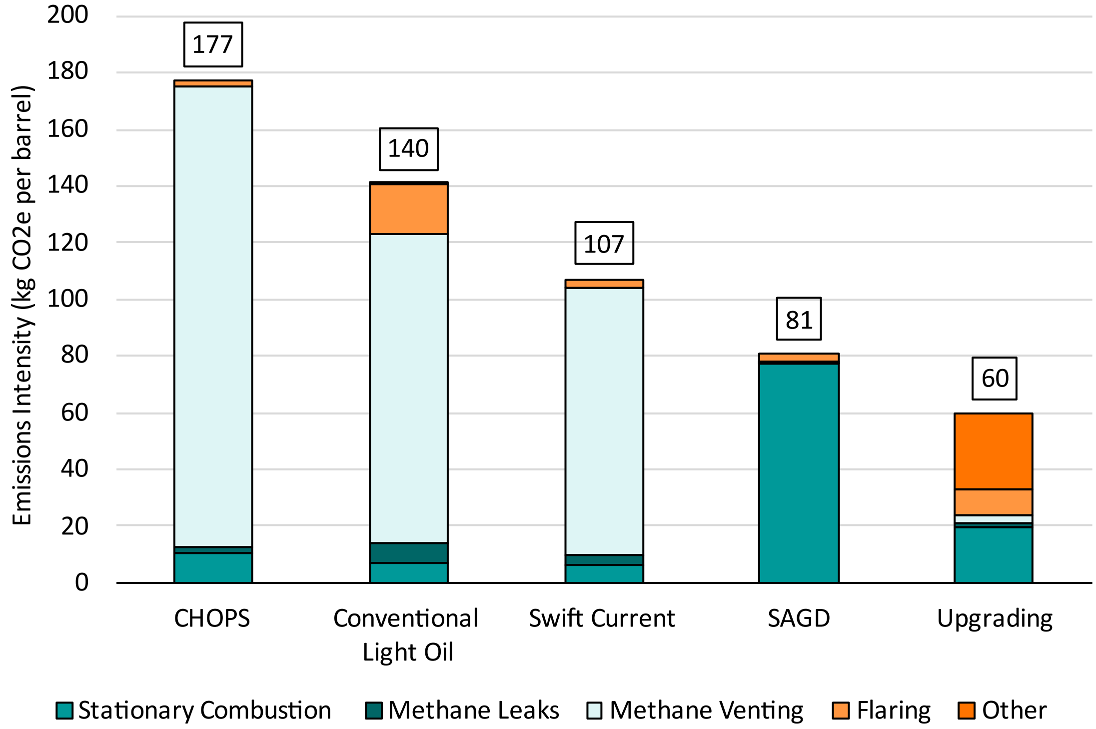
This analysis covers three core areas

- **Emissions abatement** includes the actions that Saskatchewan's oil and gas sector takes to achieve compliance under Methane 75 and the Emissions Cap in 2030, 2040 and 2050.
- **Oil and gas economics** discusses the impact that Methane 75 and Emissions Cap compliance has on sector output, investment and employment.
- **Provincial economy** explores the effects of Methane 75 and the Emissions Cap on Saskatchewan's macroeconomy, including GDP, investment, exports and government revenue.

Emissions abatement

Saskatchewan's upstream oil and gas sector is made up of many facilities and production types. Each facility has its own emissions profile, which is important to account for in an assessment of policies that affect the sector. This analysis allocates facilities to one of five oil production types (or one of two natural gas production types). Figure 1 presents the 2020 emissions intensity of the upstream oil production types in Saskatchewan.

Figure 1: Emissions intensity in key upstream oil sectors[3] in Saskatchewan in 2020, Reference Case



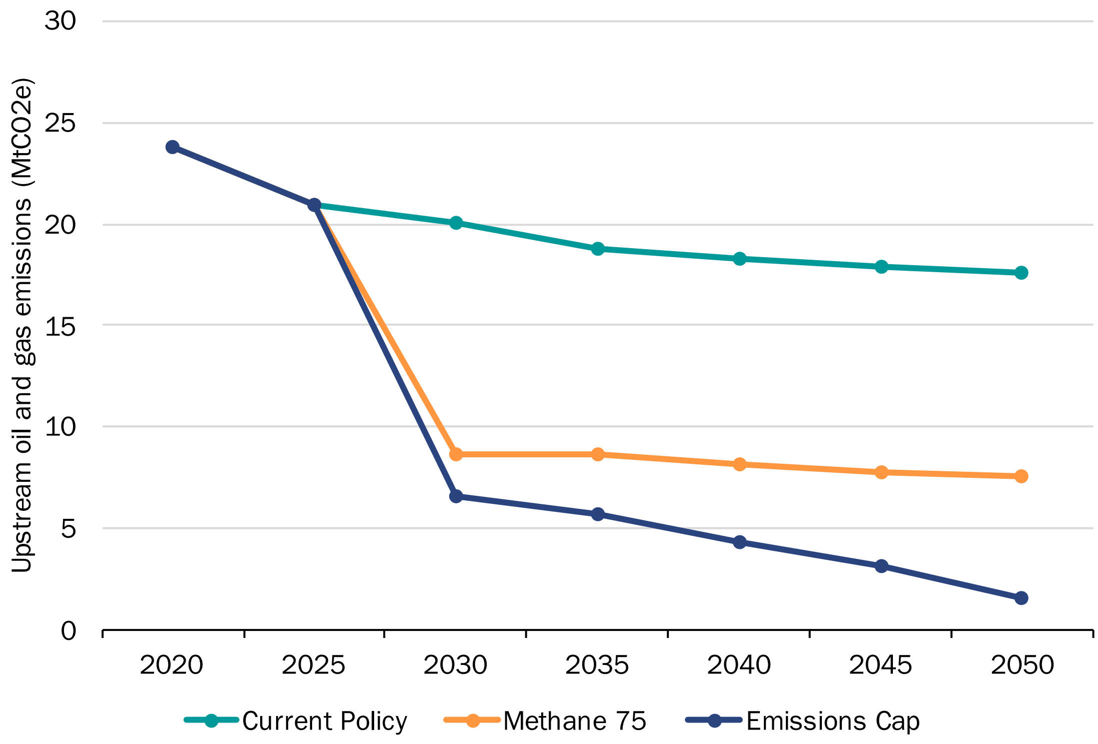
The emissions profile of each production type is important. The policies considered in this analysis have different treatments of some emissions sources. For example, Methane 75 specifies compliance actions primarily for mitigating emissions from leaked and vented methane. Further, abatement options depend on the emissions source; leaked emissions could be mitigated by increasing the frequency of Leak Detection and Repair (LDAR), while stationary combustion emissions could be mitigated via CCS.

Methane 75 and the Emissions Cap generate significant emissions reductions in Saskatchewan's oil and gas sector (Figure 2). The Methane 75 and Emissions Cap

[3] Cold Heavy Oil Production with Sand (CHOPS); Steam Assisted Gravity Drainage (SAGD)

policies both lead to lower emissions from the oil and gas sector. Methane 75 yields large reductions in process emissions, such as vented and leaked methane. The compliance actions under Methane 75 are mostly sufficient to achieve the Emissions Cap in 2030. After 2030, the Emissions Cap drives additional reductions in stationary sources, such as combustion emissions from industrial heat.

Figure 2: Annual direct upstream oil and gas emissions in Saskatchewan, Reference Case



Methane 75 leads to a 57% reduction in direct upstream oil and gas emissions in Saskatchewan in 2030, relative to Current Policy. Most of this reduction is from mitigating vented emissions, which accounts for most of Saskatchewan's methane emissions from the oil and gas sector. After 2030, Methane 75 does not require additional compliance actions, so there are minimal additional emissions reductions past 2030.

The Emissions Cap leads to a 67% reduction in direct upstream oil and gas emissions in Saskatchewan in 2030, relative to Current Policy. Most of this reduction is due to compliance actions required by Methane 75, which is also in place in the Emissions Cap scenario. Additional reductions beyond Methane 75 are due to reductions in stationary combustion emissions from industrial heat. Further reductions in both process and combustion emissions occur after 2030, as the Emissions Cap policy lowers the available emissions allowances towards net-zero by 2050. By 2050, emissions under the Emissions Cap are 91% below Current Policy levels.

Oil and gas economics

While Methane 75 and the Emissions Cap will create material reductions in annual emissions, the sector will incur additional compliance costs that may affect sector activity.

- Methane 75 compliance actions will incur an additional $356 million ($2023) per year in incremental compliance costs in 2030, relative to Current Policy, at an average abatement cost[4] of $30.6 per tCO_2e.
- The price for allowances under the Emissions Cap, which represents the marginal cost of abatement[5] in the sector, is $148 per tCO_2e in 2030[6], $177 per tCO_2e in 2040, and $693 per tCO_2e in 2050 ($2023). The average abatement cost in Saskatchewan under the Emissions Cap will be lower than the allowance price, due to lower cost abatement options, such as those required under Methane 75.

The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap. The price of Emissions Cap allowances is three times higher in 2030 and 2035 when CCS is not available. Further, the availability of DAC has the potential to lower compliance costs in 2045 and 2050 by providing an additional source of emissions allowances.

Actions required by the sector to achieve compliance under Methane 75 and the Emissions Cap will negatively affect Saskatchewan's oil and gas production. Figure 3 below presents total primary oil production in Saskatchewan under each scenario.

- **Methane 75** will lead to a 9 thousand barrels per day (kbpd) reduction (2%) in oil and gas production by 2030, and a 16-17 kbpd (3-4%) reduction by 2050, relative to Current Policy.
- **The Emissions Cap** in 2030 will lead to a 13-15 thousand barrels per day (3%) reduction in oil and gas production by 2030; 33-51 kbpd reduction (7-11%) by 2040; and 126-176 kbpd reduction (28-39%) by 2050, relative to Current Policy.

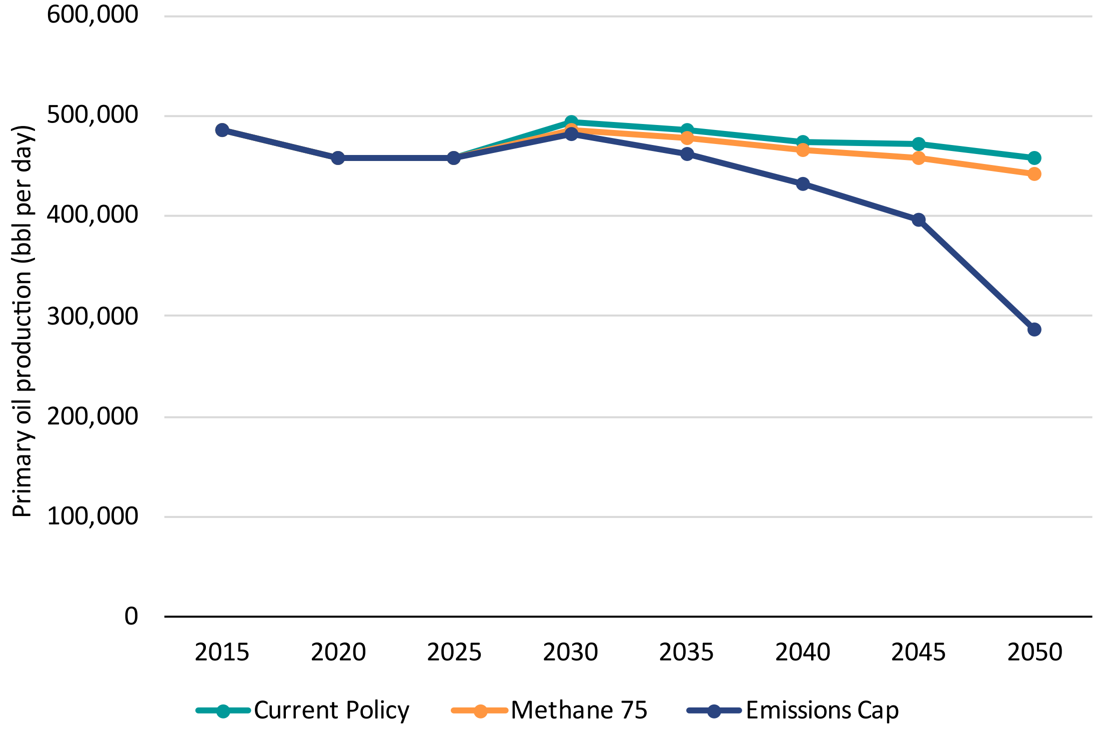
---

[4] Average abatement cost is defined as the total annual cost of emissions abatement divided by the total emissions reduced each year. Upfront capital costs are annualized using a discount rate of 17.5%.

[5] Marginal abatement cost is defined as the cost of reducing one additional unit of emissions

[6] This is equivalent to $170 per tCO2e in 2030 dollars

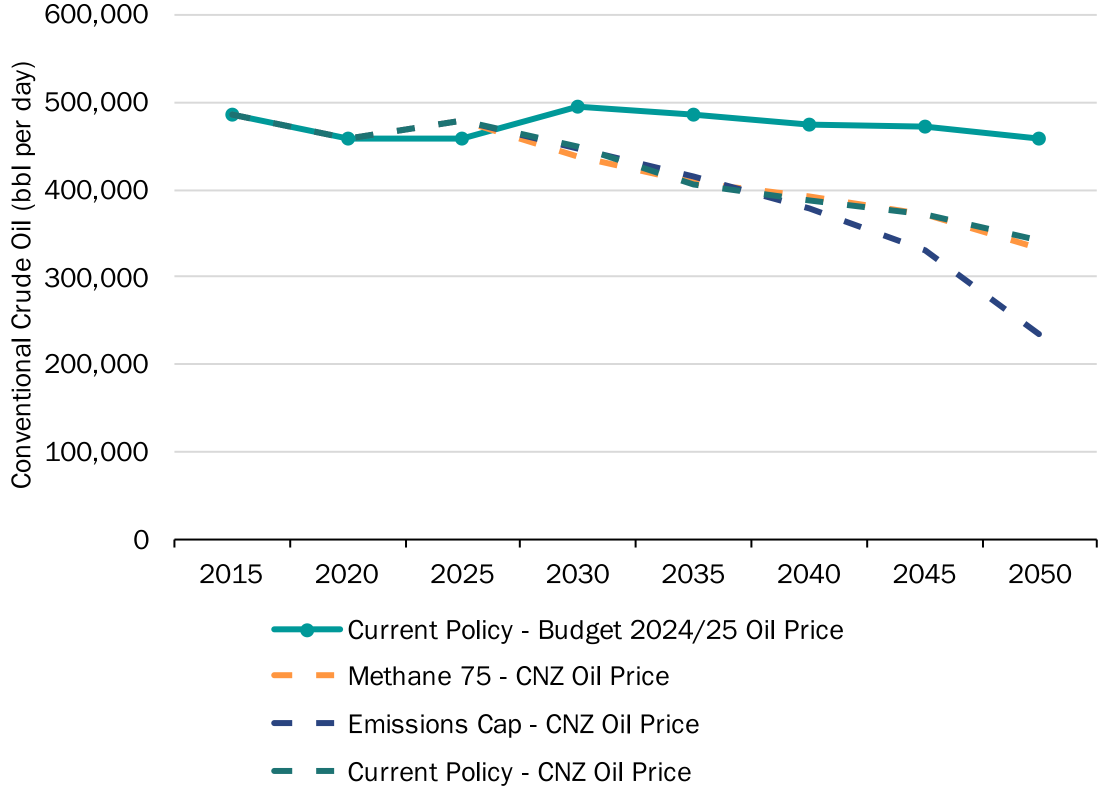
Figure 3: Total primary oil production in Saskatchewan, Reference Case



While domestic climate policy affects oil production, oil prices are even more influential for the future of the sector. Figure 4 presents primary oil production in Saskatchewan under the Budget 2024/25 oil price (WTI $65-70 per bbl, 2030-2050) and the Canada Energy Regulator (CER) Canada Net-Zero scenario oil price (WTI $58-62 per bbl, 2030-2050).

- When a lower oil price is simulated, as per the CER's Canada Net-Zero scenario, the change in oil price has a significant impact on production outcomes, even if no further domestic climate policy is introduced.
- The oil price effect can also dampen the impact of domestic climate policy. Under the Canada Net-Zero oil price, production levels across all policy scenarios are similar. Production in all scenarios remains within a range of 9-12 thousand barrels per day until 2045, when the stringency of the Emissions Cap drives production incrementally lower.

Figure 4: Oil production in Saskatchewan is sensitive to global oil prices



Availability of CCS is important for continued SAGD oil production under the Emissions Cap, but less important for production types without significant stationary combustion emissions. When CCS is not available, SAGD oil production in Saskatchewan is fully retired by 2050 under the Emissions Cap. However, production types without significant stationary combustion emissions – conventional light, CHOPS and Swift Current – initially benefit from the emissions cap due to increased cap-and-trade revenues.

Investment in the oil and gas sector is impacted by Methane 75 and the Emissions Cap. In 2030, less capital deployment for oil production is offset by additional investment required for compliance, largely from mitigating vent and leak emissions, and some investment in CCS. After 2030, the production gap leads to lower overall investment in both Methane 75 and the Emissions Cap, despite the growth in CCS deployment under the cap.

Lower oil production under Methane 75 and the Emissions Cap results in lower employment in the oil and gas sector that increases after 2030. There is a regional nuance to where job losses might occur. For example, production losses under Methane 75 will likely be concentrated in regions where there are wells with relatively high venting and leaked emissions and relatively low production rates. In contrast, new jobs will occur where production continues.

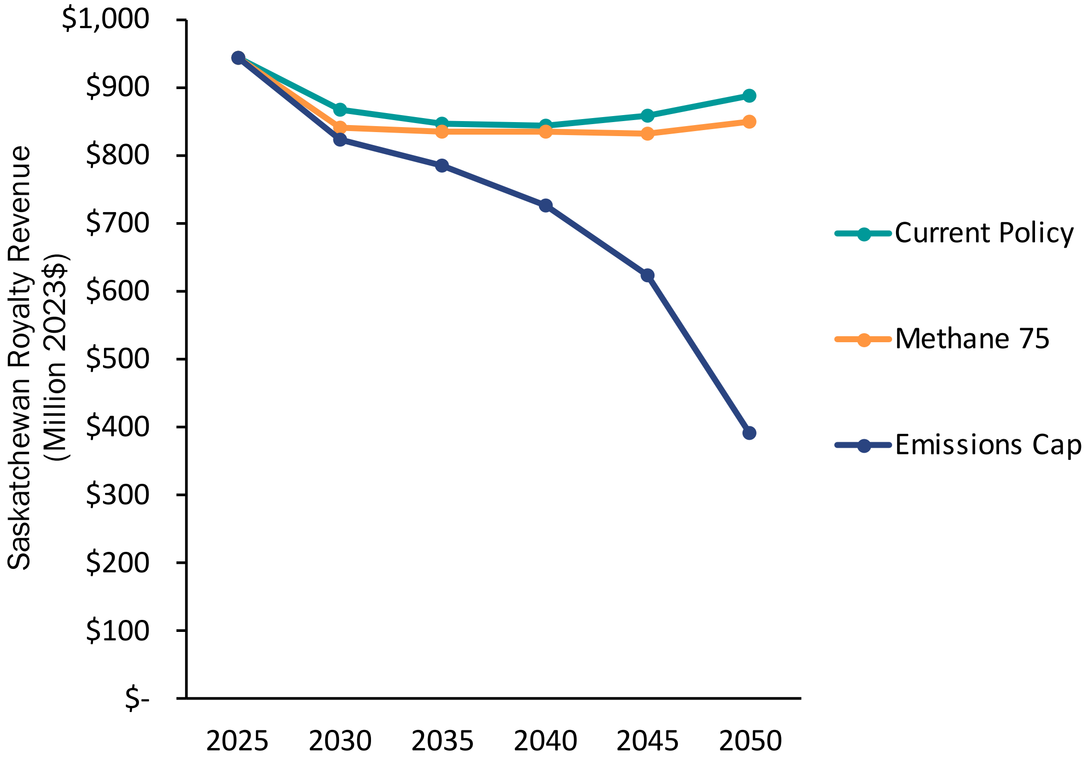
- In 2030, the impact of Methane 75 and the Emissions Cap on oil and gas jobs is marginal (~100 fewer full-time equivalent jobs). Lower production leads to fewer jobs in the sector but this effect is partially offset by the additional labour required to implement compliance actions under each policy, such as increased LDAR monitoring frequency.
- After 2030, Methane 75 results in a small net reduction in employment, approximately 200 fewer full-time jobs than Current Policy. The Emissions cap leads to 600 fewer jobs in 2040 and 3,000 fewer jobs in 2050, relative to Current Policy.

Provincial economy

Lower oil production under Methane 75 and the Emissions Cap leads to reduced government revenue in Saskatchewan, driven primarily by lower royalty and production tax revenue (Figure 5).

- Under Methane 75, annual provincial and federal government revenue in Saskatchewan is $0.1 billion ($2023) below Current Policy between 2030 and 2050, with royalty and production tax revenue up to $36 million below Current Policy.
- Under the Emissions Cap, total provincial and federal government revenue in Saskatchewan is less than $0.1 billion below Current Policy in 2030, with the gap increasing to $0.5 billion in 2040 and $2.1 billion in 2050. Royalty and production taxes make up about a quarter of the total lost revenue.

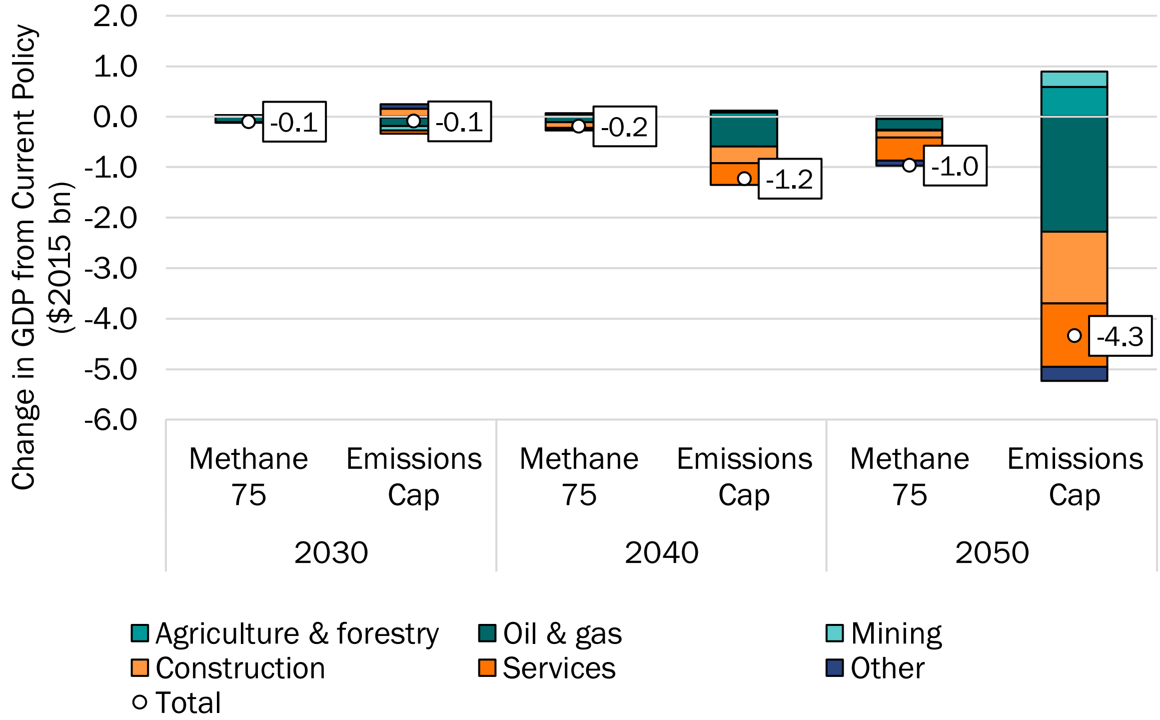
Figure 5: Total royalty and production tax revenue in Saskatchewan, Reference Case



Economy-wide GDP grows under all scenarios between now and 2050. However, Methane 75 and the Emissions Cap reduce Saskatchewan's GDP growth. Figure 6 presents the difference in GDP from Current Policy for the Methane 75 and Emissions Cap scenarios.

Table 3 presents sectoral GDP in Saskatchewan in 2030 and 2050 under all three scenarios.

Figure 6: Change in annual GDP from Current Policy, Reference Case



- Under **Methane 75**, Saskatchewan's economy is $0.1 billion (0.1%) smaller relative to Current Policy between 2025 and 2030, and $1.0 billion (0.7%) smaller between 2025 and 2050. Lower GDP growth is driven by slower growth in the oil and gas and construction sectors due to lower oil production and the link between oil sector output and construction activity.

- Under **the Emissions Cap**, Saskatchewan's economy is $0.1 billion (0.1%) smaller relative to Current Policy between 2025 and 2030, and $4.3 billion (3.1%) smaller between 2025 and 2050. Growth slows mostly in the oil and gas sector, but the construction and services sectors also exhibit lower cumulative GDP by 2040 and 2050.

  Construction GDP increases slightly relative to the Current Policy scenario in the 2025-2030 timeframe, due to increased investment in CCS, but has slower growth in 2025-2040 and 2025-2050. GDP growth from the services sector is slower in all timeframes, reflecting lower overall economic activity. Some sectors, such as agriculture and mining, increase their overall GDP contribution relative to Current Policy by 2050 due to increased demand for biofuels.

Table 3: Annual GDP by sector and scenario, Reference Case (C$2015 billion)

Sector	2030			2050		
	Current Policy	Methane 75	Emissions Cap	Current Policy	Methane 75	Emissions Cap
Agriculture & forestry	10.4	10.4	10.3	17.1	17.1	17.7
Oil & gas	8.3	8.2	8.2	7.2	7.0	5.0
Mining	6.9	6.9	6.8	8.0	8.0	8.3
Construction	7.5	7.5	7.7	9.6	9.5	8.2
Services	46.5	46.5	46.4	81.9	81.4	80.6
Other	11.4	11.4	11.5	16.2	16.1	15.9
Total	**91.1**	**91.0**	**91.0**	**140.0**	**139.0**	**135.6**

Key insights

Insight 1: Methane 75 and the Emissions Cap create material reductions in oil and gas sector emissions, but the sector will incur additional compliance costs that may affect sector activity.

- Abatement actions under Methane 75 will reduce vented and leaked emissions in Saskatchewan's oil and gas sector by 11.0 Mt CO_2e in 2030 relative to Current Policy. The incremental levelized compliance cost of the policy is $356 million per year (2023$) in 2030, at an average abatement cost[7] of $30.6 per tCO_2e.
- The price for allowances under the Emissions Cap, which represents the marginal cost of abatement[8] in the sector, is $148 per tCO_2e in 2030[9], $177 per tCO_2e in 2040, and $693 per tCO_2e in 2050 ($2023). The average abatement cost in Saskatchewan under the Emissions Cap will be lower than the allowance price, due to lower cost abatement options, such as those required under Methane 75.

Insight 2: Achieving compliance with Methane 75 and the Emissions Cap will impact Saskatchewan's oil and gas production, investment and employment.

- Oil production under Methane 75 will be 2-4% below Current Policy between 2030 and 2050. Production under the Emissions Cap is similar to Methane 75 in 2030 but declines further as the policy brings the sector closer to net-zero emissions in 2050 – 7-11% below Current Policy in 2040 and 28-39% below Current Policy in 2050.
- Oil and gas investment under Methane 75 is equal to that of Current Policy in 2030 due to compliance investments offsetting reduced production capital. Investment is higher under the Emissions Cap in 2030, thanks to additional investment in CCS technology. However, oil and gas investment in both scenarios is consistently below Current Policy after 2030.
- Emissions Cap impacts after 2030 are based on the assumption that emissions allowances decline linearly to achieve net-zero emissions by 2050. ECCC indicate in the December 2023 Regulatory Framework that the policy will be aligned with net-zero emissions by 2050 but does not indicate how that would be achieved.

---

[7] Average abatement cost is defined as the total annual cost of emissions abatement divided by the total emissions reduced each year. Upfront capital costs are annualized using a discount rate of 17.5%.

[8] Marginal abatement cost is defined as the cost of reducing one additional unit of emissions

[9] This is equivalent to $170 per tCO2e in 2030 dollars

Insight 3: Reduced oil and gas production under Methane 75 and the Emissions Cap leads to lower government revenue and slower economic growth in Saskatchewan

- In 2030, royalty and production tax revenue are 3% below Current Policy under Methane 75 and 5% below Current Policy under the Emissions Cap. Under the Emissions Cap, the revenue gap grows to 14% below Current Policy in 2040 and 56% below Current Policy in 2050.
- GDP growth is positive in all scenarios but lower growth under both Methane 75 and the Emissions Cap results in $0.3 billion less cumulative GDP relative to Current Policy between 2025 and 2030. Between 2025 and 2050, the difference in cumulative GDP relative to Current Policies is $11.9 billion under Methane 75 and $35.4 billion under the Emissions Cap.

Insight 4: Oil prices are an important factor in driving production outcomes. Under the Canada Net-Zero sensitivity, production outcomes are driven more by a lower global oil price than either the Methane 75 or Emissions Cap policies. In 2030 and 2040, production outcomes are similar in all three scenarios when assuming a low oil price.

Insight 5: The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap. The price of Emissions Cap allowances increases three-fold in 2030 and 2035 if CCS is not available. Further, the availability of DAC has the potential to lower compliance costs in later years (2045 and 2050), which could help the sector mitigate some production shut-in as the Emissions Cap level approaches net-zero.

1. Introduction

In 2023, *The Saskatchewan First Act* established the Economic Impact Assessment Tribunal (EIAT) to conduct economic impact assessments of Government of Canada initiatives that may cause harm to Saskatchewan projects, operations, activities, industries, businesses, or residents.

This study report was requested by the EIAT to examine the economic impacts of the proposed *Oil and Gas Sector Greenhouse Gas Emissions Cap* (Emissions Cap)[10] and *Enhanced Oil and Gas Methane Regulations* (Methane 75)[11] on Saskatchewan between 2025 and 2050.

The EIAT requires an understanding of how these policies are likely to impact Saskatchewan, including:

- the estimated compliance cost of the Emissions Cap and Methane 75 between 2019 up to and including 2030, when Methane 75 will drive the majority of emissions reductions;
- the estimated compliance cost of the Emissions Cap and Methane 75 between 2030 up to and including 2050, when the impacts of the Cap will become more pronounced;
- the forecasted effect of the Emissions Cap and Methane 75 on oil and gas investment, production, and royalty/tax revenues in Saskatchewan between 2019 and each of 2030, 2040 and 2050; and
- the forecasted cumulative effect of the Emissions Cap and Methane 75 on the provincial economy that regulatory compliance will cause as of the end of each of 2030, 2040 and 2050.

This analysis represents Navius Research's independent submission for the Economic Impact Assessment Tribunal (EIAT). Navius Research is well placed to provide these services due to our expertise in simulating federal and provincial climate policy, extensive knowledge of abatement technologies, and state-of-the-art energy-economy

---

[10] Government of Canada (2023) Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap. Available from: https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/oil-gas-emissions-cap/regulatory-framework.html

[11] Government of Canada (2023). Canada Gazette, Part I, Volume 157, Number 50: Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector). Available from: https://www.gazette.gc.ca/rp-pr/p1/2023/2023-12-16/html/reg3-eng.html

modelling framework. Navius' modelling toolkit has Saskatchewan-specific model customizations that consider the unique elements of Saskatchewan's energy sector.

The report is structured as follows:

- Section 2: Analytical approach
- Section 3: Impact analysis
- Section 4: Key insights
- Appendix A: Legislated federal and provincial policies
- Appendix B: Technoeconomic assumptions

2. Analytical approach

The gTech-IESD modelling suite was used to produce this analysis. This model's key features include an exhaustive accounting of Canada's macroeconomy, technology choice decision-making, hourly dispatch of electricity, and electricity system capacity expansion. More information on the model is available on our website.

The model version used for this analysis has been customized to represent the unique elements of Saskatchewan's energy sector. Customizations include improved representations of:

- Saskatchewan's energy sector by delineating Saskatchewan's heavy oil sector into three subsectors: Cold Heavy Oil Production with Sand (CHOPS), Steam Assisted Gravity Drainage (SAGD), and Swift Current production.
- Methane abatement costs and requirements under the provincial *Oil and Gas Emissions Management Regulations* (OGEMR)[12], *Venting and Flaring requirements: Directive PNG036*[13], and federal *Enhanced Oil and Gas Methane Regulations*[14].

[12] Government of Saskatchewan (2024). The Oil and Gas Emissions Management Regulations. Available from: https://publications.saskatchewan.ca/api/v1/products/92804/formats/109853/download

[13] Government of Saskatchewan (2024). Venting and Flaring Requirements: Directive PNG036. Available from: https://publications.saskatchewan.ca/api/v1/products/103751/formats/115120/download

[14] Government of Canada (2023). Canada Gazette, Part I, Volume 157, Number 50: Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector). Available from: https://www.gazette.gc.ca/rp-pr/p1/2023/2023-12-16/html/reg3-eng.html

2.1. Calibration

To characterize Saskatchewan's energy-economy, gTech is calibrated to a variety of data sources. Key calibration data sources include:

- Government of Saskatchewan's Budget 2024/25
- Environment and Climate Change Canada's 2024 National Inventory Report[15]
- Statistics Canada's Supply-Use Tables[16]
- Natural Resources Canada's Comprehensive Energy Use Database[17]
- Statistics Canada's Annual Industrial Consumption of Energy Survey[18]
- Statistics Canada's Report on Energy Supply and Demand[19]
- Canada Energy Regulator's (CER) Canada's Energy Future 2023[20]
- National Renewable Energy Laboratory[21]
- Statistics Canada datasets on the electricity sector[22]
- Navius' technology database

The calibration scenario sets the basis for the impact assessment. Our calibration aligns gTech-IESD with key input forecasts, such as GDP, and oil production. This scenario includes a set of policies that are assumed to be consistent with the key input forecasts. The primary forecast used for calibration in this analysis is the Government of Saskatchewan Budget 2024/25. We have assumed the following policies are consistent with the Budget 2024/25 forecasts for oil and gas production and GDP:

---

[15] Environment and Climate Change Canada. National Inventory Report. Available from: www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-gas-emissions/inventory.html

[16] Statistics Canada. Supply and Use Tables. Available from: www150.statcan.gc.ca/n1/en/catalogue/15-602-X

[17] Natural Resources Canada. Comprehensive Energy Use Database. Available from: http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/menus/trends/comprehensive_tables/list.cfm

[18] Statistics Canada. Annual Industrial Consumption of Energy Survey. Available from: www.statcan.gc.ca

[19] Statistics Canada. Report on Energy Supply and Demand in Canada. Available from: https://www150.statcan.gc.ca/n1/en/catalogue/57-003-X

[20] Canada Energy Regulator. (2023). Canada's Energy Future 2023. Available from: https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2023/

[21] National Renewable Energy Laboratory (2023). Annual Technology Baseline. Available from: https://atb.nrel.gov/

[22] Statistics Canada. (n.d.). *Data.* Available from: https://www150.statcan.gc.ca/n1/en/type/data?subject_levels=25%2C2504

- \$65 per tCO_2e federal fuel charge and Output Based Pricing System (OBPS) backstop price
- Saskatchewan's Output Based Performance Standard
- Saskatchewan's Oil and Gas Emissions Management Regulation (OGEMR)
- Other Legislated Federal and Provincial policies presented in Appendix A.

The production forecast is based on future investment assumptions by industry, so it accounts for industrial sentiment regarding future carbon pricing. The basis for using a \$65 per tCO_2e carbon pricing assumption for the calibration scenario is that available evidence on industrial sentiment of future carbon pricing indicates an expected price below \$170 per tonne in 2030, such as the strike price for a carbon contracts-for-difference deal via the Canada Growth Fund[23] and recent settlement prices for 2024 TIER credits[24].

[23] The Globe and Mail (2024) Alberta landfill waste carbon capture project inks deal with Canada Growth Fund. Available from: https://theglobeandmail.com/business/industry-news/energy-and-resources/article-alberta-landfill-waste-carbon-capture-project-inks-deal-with-canada/

[24] ICE NGX Environmental Settlement Prices. Available from: https://www.ice.com/report/291

2.2. Policy scenarios

This analysis uses three policy scenarios to determine the impact of Methane 75 and the Emissions Cap on Saskatchewan. These policy scenarios have been simulated in five-year increments between 2015 – the model base year – and 2050. This analysis also includes a sensitivity analysis to account for future uncertainty, where each policy scenario is simulated through several iterations, while varying key parameters (the 'sensitivity scenarios' described in section 2.2).

The Table below summarizes the three policy scenarios.

- Current Policy: This policy scenario will consist of legislated policies at the federal and provincial level. The full list of legislated policies simulated in this analysis is available in Appendix A. This scenario serves as the policy counterfactual.
- Methane 75: This policy scenario will implement Methane 75, in addition to Current Policy.
- Emissions Cap: This policy scenario will implement Methane 75 and the Oil and Gas Emissions Cap, in addition to Current Policy.

Table 4: Key policy assumptions

Policy area	Current Policy	Methane 75	Emissions Cap
Carbon pricing	The federal carbon pricing backstop rises by \$15/tCO_2e per year to \$170/tCO_2e in 2030, in real terms, with the Output-Based Pricing System (OBPS) in place		
Other legislated policies	Federal Investment Tax Credits[25], Clean Fuel Regulations, ZEV Mandate, etc. Implemented as per Appendix A		
Clean Electricity Regulations	Not implemented		
Oil and Gas Methane Policy	OGEMR[26] and Directive PNG036[27] only	OGEMR and Directive PNG036 in 2025; Methane 75[28] in 2030 onwards	
Oil and Gas Emissions Cap	Not implemented		Implemented as per Navius' interpretation of the December 2023 Regulatory Framework[29]

[25] Government of Canada (2023) Clean Investment Tax Credits in Budget 2023. Available from: https://www.canada.ca/en/environment-climate-change/news/2023/04/minister-guilbeault-highlights-the-big-five-new-clean-investment-tax-credits-in-budget-2023-to-support-sustainable-made-in-canada-clean-economy.html

[2] Government of Saskatchewan (2024). The Oil and Gas Emissions Management Regulations. Available from: https://publications.saskatchewan.ca/api/v1/products/92804/formats/109853/download

[27] Government of Saskatchewan (2024). Venting and Flaring Requirements: Directive PNG036. Available from: https://publications.saskatchewan.ca/api/v1/products/103751/formats/115120/download

[28] Government of Canada (2023). Canada Gazette, Part I, Volume 157, Number 50: Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector). Available from: https://www.gazette.gc.ca/rp-pr/p1/2023/2023-12-16/html/reg3-eng.html

[29] Government of Canada (2023) Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap. Available from: https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/oil-gas-emissions-cap/regulatory-framework.html

2.2.1. Oil and gas sector policy design

The characterization of the Methane 75 and Emissions Cap policies is described below.

Methane 75

The simulation of this policy in gTech-IESD has been updated following the proposed regulatory amendments to reduce methane emissions in the oil and gas sector, published in December 2023. The policy objective is to achieve at least a 75% reduction in oil and gas sector methane emissions by 2030, relative to 2012 levels. The proposed regulations, as per Canada Gazette, Part I, Volume 157, Number 50, sets emissions management requirements for upstream oil and gas facilities, as well as an alternative performance-based approach for compliance.

This policy is represented in gTech-IESD as a command-and-control policy, which requires the sector to take certain abatement actions by 2030. The representation of methane abatement technologies in gTech-IESD, consisting of venting, leak detection and repair (LDAR), and flaring have been updated based on data provided by the Saskatchewan Ministry of Energy and Resources. The Ministry provided Navius with a detailed breakdown of required actions for facilities covered by Methane 75 and their associated costs, including:

- Venting actions, such as combustor installations and vapor recovery unit retrofits;
- LDAR actions, such as increasing frequency of gas imaging surveys and leak repairs; and
- Flaring and other compliance actions, such as flare stack replacements.

Appendix B details the updated methane technology-end-use pairs in gTech-IESD, assumed compliance actions under both OGEMR and Methane 75, and their associated costs.

Emissions Cap

This section provides more detail on the oil and gas emissions cap. We first discuss the regulatory framework from Environment and Climate Change Canada (ECCC), followed by Navius' interpretation of the framework and the approach used to model it.

Regulatory framework

The federal government has announced its intention to cap GHG emissions from the oil and gas sector. On December 7th, 2023, Environment and Climate Change Canada published a regulatory framework to cap oil and gas sector GHG emissions. The framework proposes a national emissions cap-and-trade system with an upper bound on GHGs from the oil and gas sector, to be phased in between 2026 and 2030. Beyond 2030, the framework indicates an intention to lower the emissions cap to align with net-zero emissions by 2050.

The emissions cap will cover direct (Scope 1) emissions in the sector, as well as indirect (Scope 2) emissions from combustion related to electricity and hydrogen use in the sector. The upstream oil and gas sectors covered under the cap are:

- Bitumen and other crude oil production, including upstream oil and natural gas gathering pipelines
- Surface mining of oil sands and extraction of bitumen
- Upgrading of bitumen or heavy oil to produce synthetic crude oil
- Production/processing of natural gas, natural gas liquids, and liquified natural gas

The framework distinguishes between the **emissions cap level** and the **legal upper bound**.

- The **emissions cap level, which is equivalent to the total emission allowances issued each year, is proposed to be set between 106 and 112 Mt CO_2e in 2030**. The emissions cap is "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".[30]

  Emissions allowances issued under the cap-and-trade regulations would not be fungible with other carbon pricing systems or regulatory instruments. The proposed approach assumes the free allocation of allowances set by facility based on (1) a baseline production level and (2) a free allocation rate for a given product or activity, set as CO_2e tonnes per unit of product produced (i.e., emissions intensity of production). 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.

- The **legal upper bound, which is the maximum emissions the sector will be allowed to emit each year, is proposed to be set between 131 and 137 Mt CO_2e in 2030.**

[30] Government of Canada (2023) Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap. Available from: https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/oil-gas-emissions-cap/regulatory-framework.html

This maximum level is comprised of the total number of emission allowances plus the maximum allowable quantity of other eligible compliance units.

Flexible compliance units are available via (a) paying into a decarbonization fund, with the unit price set at the estimated price necessary to achieve the upper bound, or (b) buying offset credits under Canada's GHG Offset Credit System or a recognized provincial offset credit system.

Table 5 summarizes the key emissions cap levels, as laid out in the regulatory framework.

Table 5: Oil and gas emissions cap levels

Policy category	2030 emissions cap level	2030 legal upper bound
Emissions level	106-112 $MtCO_2e$	131-137 $MtCO_2e$
Compliance approach	Allowances allocated based on emissions intensity	Flexible compliance via technology fund and offsets
Emissions reductions	Slightly below technically achievable emissions reductions	Set at technically achievable emissions reductions
Assumed production level	2019 oil production level	CER Canada Net-Zero production level

The regulatory framework indicates that the emissions cap in 2030 will result in a marginal carbon price of $50 per tonne CO_2e. Combined with the OBPS, which will have a backstop price of $170 per tonne CO_2e in 2030, the total carbon pricing stringency for the oil and gas sector is expected to be $220 per tonne CO_2e in 2030 (nominal dollars).

The regulatory framework indicates that the policy design will account for changing circumstances related to energy demand and technological readiness. The policy will allow for flexibility to enable the oil and gas sector to respond to changes in global demand for energy, e.g. change in oil prices. The policy will also account for the availability of technology deployment across the oil and gas sector, including 'technological readiness' of key mitigation solutions, such as CCS technology.

Modelling assumptions

This subsection summarizes Navius' interpretation of ECCC's proposal for how the emissions cap will be implemented, and our methodology for simulating the policy in gTech-IESD. This analysis explicitly models the oil and gas emissions cap in gTech-IESD as a cap-and-trade system designed as a tradable performance standard.

Emissions allowances under the Emissions Cap are allocated based on historical emissions-intensity, i.e. tonnes CO_2e per unit of production.

- Allowances under the emissions cap are freely allocated, i.e. no auctioning of allowances.
- Allocations are set by production type, e.g. heavy crude oil, light crude oil, bitumen.
- We assume free allowances under the cap are set based on each sector's emissions intensity in the 2025 model year. Emissions allowances can be traded between covered sectors to ensure least-cost compliance.
- The emissions cap covers emissions from upstream oil and gas activities and LNG production, as well as indirect combustion emissions from electricity use.
- We assume that the oil and gas cap is allowed to overlap with federal and provincial output-based pricing systems. This means that there are no restrictions to generating compliance credits under the OBPS and the oil and gas emissions cap for the same reduction action, such as implementation of CCS. However, allowances generated under the Emissions Cap are not fungible with other compliance credits.

For this analysis we fix the legal upper bound in 2030 at 135 Mt CO_2e. The legal upper bound is comprised of:

- 110 Mt CO_2e of emissions allowances under the cap-and-trade system; and
- 25 Mt CO_2e in other flexible compliance credits i.e., offset credits or payment into a decarbonization fund. Flexible compliance is assumed to be available at $170 per tCO_2e ($2030) in all years.[31] Emissions reductions achieved through flexible compliance credits are not explicitly simulated in this analysis.

One of the principles of the regulatory framework is that "emissions decline at a pace and scale to meet net-zero by 2050".[32] This analysis assumes the Emissions Cap is reduced linearly between 2030 and 2050 to achieve net-zero emissions by 2050. Figure 7 shows the legal upper bound in each model year from 2030 to 2050, splitting out the emissions allowances under the cap-and-trade system, and the volume of

---

[31] Setting a fixed price reflects payments into a decarbonization fund, as occurs with many OBPS programs. In a competitive market, the price of offsets could be above or below this level.

[32] Government of Canada (2023) Regulatory Framework for an Oil and Gas Sector Greenhouse Gas Emissions Cap. Available from: https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/oil-gas-emissions-cap/regulatory-framework.html

flexible compliance credits. The legal upper bound consists of the emissions cap and flexible compliance units, held constant at 25 Mt.

Figure 7: Oil and gas sector emissions cap trajectory

To avoid potentially reduced stringency of carbon pricing, this analysis assumes that the OBPS continues to be binding at $170 per tCO_2e (2030$) in the future. An influx of non-incremental OBPS credits due to the oil and gas emissions cap could lead to the carbon price under the OBPS being non-binding. As a result, the stringency of performance standard benchmarks continue to increase in this forecast to maintain a binding carbon price.

2.2.2. Sensitivity analysis

For each policy scenario, the impact of uncertainty in key parameters are tested using a sensitivity analysis. This analysis includes the following sensitivity scenarios which are defined by the value of uncertain model inputs:

Table 6: Sensitivity analysis

Parameter	Sensitivity range	Reference Case
Oil and natural gas prices (see Table 7)	1. GoS Budget 2024/2025 $65-70 per barrel, 2030-2050 (West Texas Intermediate (WTI) $2022 US) 2. Canada Energy Regulator 2023 Canada Net-Zero[33] $58-62 per barrel, 2030-2050	GoS Budget 2024/2025 $65-70 per barrel, 2030-2050 (WTI $2022 US)
Abatement technology costs	1. Navius reference technology costs, including CCS 2. As per 1, with high CCS, hydrogen and Small modular nuclear reactor (SMnR) costs 3. As per 1, with low CCS, hydrogen and SMnR costs	Navius reference costs, including CCS[34]
CCS and SMnR availability	1. CCS is available in SAGD, oil sands and upgrading sectors; SMnRs are available for cogeneration 2. CCS is unavailable in all upstream oil and gas sectors; all SMnR technologies are unavailable	CCS is available in SAGD, oil sands and upgrading sectors; SMnRs are available for cogeneration
Direct Air Capture (DAC) availability	1. DAC is not available 2. DAC is available and can participate in the Emissions Cap cap-and-trade market, using Navius' high DAC cost assumptions	DAC is not available

[33] Canada Energy Regulator (2023) Canada's Energy Future 2023. Available from: https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2023/

[34] The original Scope of Work included SaskPower generation costs. The inclusion of these costs led to model issues, so we have used Navius reference costs for electricity generation technologies.

Table 7: Commodity price sensitivities, Western Texas Intermediate (WTI) oil prices

Sensitivity	Units	2025	2030	2035	2040	2045	2050
GoS Budget 2024/25	$2022US/bbl	70.7	70.2	68.9	67.5	66.2	64.9
CER 2023 CNZ	$2022US/bbl	74.8	61.5	60.5	59.5	58.5	57.5

2.2.3. Analysis caveats and limitations

Representation of Saskatchewan's oil and gas sector. Saskatchewan's oil and gas industry is highly heterogenous, with variation in both the types of production and size of facility. The array of facilities in Saskatchewan is challenging to capture in modelling exercises that aggregate sectors, as computable general equilibrium models do. This analysis delineates oil production in Saskatchewan by production type and goes beyond the level of representation in previous analyses. Each production type is based on a typical facility, but the model does not capture all the variation in size of facilities. The size of facility is important to consider when evaluating the impact of oil and gas policies, as the project economics of deploying certain compliance actions on smaller or larger facilities may differ.

Representation of oil and gas policy compliance costs for Methane 75. The characterization of methane management practices in gTech-IESD requires an assumption about the proportion of facilities that will take compliance actions and the proportion that will cease production. This assumption is important because the average cost of emissions abatement is generally higher for small facilities than for large facilities. Assuming that all facilities take compliance actions will overestimate the cost of abatement if some facilities choose to cease production, as the most expensive compliance action at the marginal facility would not take place. Similarly, assuming too many facilities cease production would underestimate the cost of abatement.

This analysis based the methane management practices on an assumption that 6-7% of oil production in Saskatchewan is retired due to Methane 75. Results indicate that 3-4% of oil production is retired in response to Methane 75 by 2050. As a result, this analysis represents a conservative estimate of production impacts.

The Emissions Cap policy design is uncertain. At time of writing, the Emissions Cap has been proposed by the federal government but has not proceeded past the Regulatory Framework stage. The final policy design has not been set, so simulating this policy requires assumptions on what the final regulations will entail. As an example, Navius has attempted to align with ECCC's intent for net-zero by 2050 by lowering the cap after 2030 to achieve net-zero emissions by 2050. This assumption leads to significant impacts on production, GDP and other metrics. However, ECCC has not made any substantive statement about the policy design after 2030, so this interpretation may not reflect the final regulations.

Labour availability in Saskatchewan. Labour availability and productivity in this analysis are assumed to grow in line with the Parliamentary Budgetary Officer (PBO) 2023 Fiscal Sustainability Report. The PBO report forecasts positive population growth and labour productivity growth in Saskatchewan between 2022 and 2050. This analysis assumes that all labour classes in Saskatchewan evolve in line with these estimates. gTech-IESD's labour classes do not necessarily capture the nuance of skill requirements for particular sectors nor any shortage of labour within these skill sets.

Assumed breakeven price for oil. gTech-IESD uses supply curves to estimate the impact of changes in costs or revenues on sector output. For oil production, this supply curve requires an assumption on the breakeven price for oil, defined as the oil-equivalent price required to recover all costs plus a return on capital. This assumption affects the sensitivity of oil production to changes in costs. Breakeven prices for this analysis were inferred based on the CER's 2023 Canada's Energy Future report (see Appendix B).

Global price of oil as an exogenous assumption. This analysis sets the global price of oil as an external assumption. Variation in the price of oil has the potential to have a bigger impact on oil production and economic outcomes than domestic policy. However, this impact can only be explored with sensitivity analysis.

3. Impact analysis

This section discusses the main findings of the impact analysis of Methane 75 and the Emissions Cap in Saskatchewan.

- **Emissions abatement** includes the actions that Saskatchewan's oil and gas sector takes to achieve compliance with Methane 75 and the Emissions Cap.
- **Oil and gas economics** discusses the impact that Methane 75 and Emissions Cap compliance has on sector output, investment and employment.
- **Provincial economy** explores the effects of Methane 75 and the Emissions Cap on Saskatchewan's macroeconomy, including GDP, investment, exports and government revenue.

3.1. Emissions abatement

This section explores how the oil and gas sector complies with Methane 75 and the Emissions Cap in 2030, 2040 and 2050. The focus of this section is on compliance via emissions abatement. Compliance can also be met by ceasing to produce some amount of oil and/or gas ("shut-in production") – Section 3.2 discusses the impact of these policies on production.

3.1.1. Overview

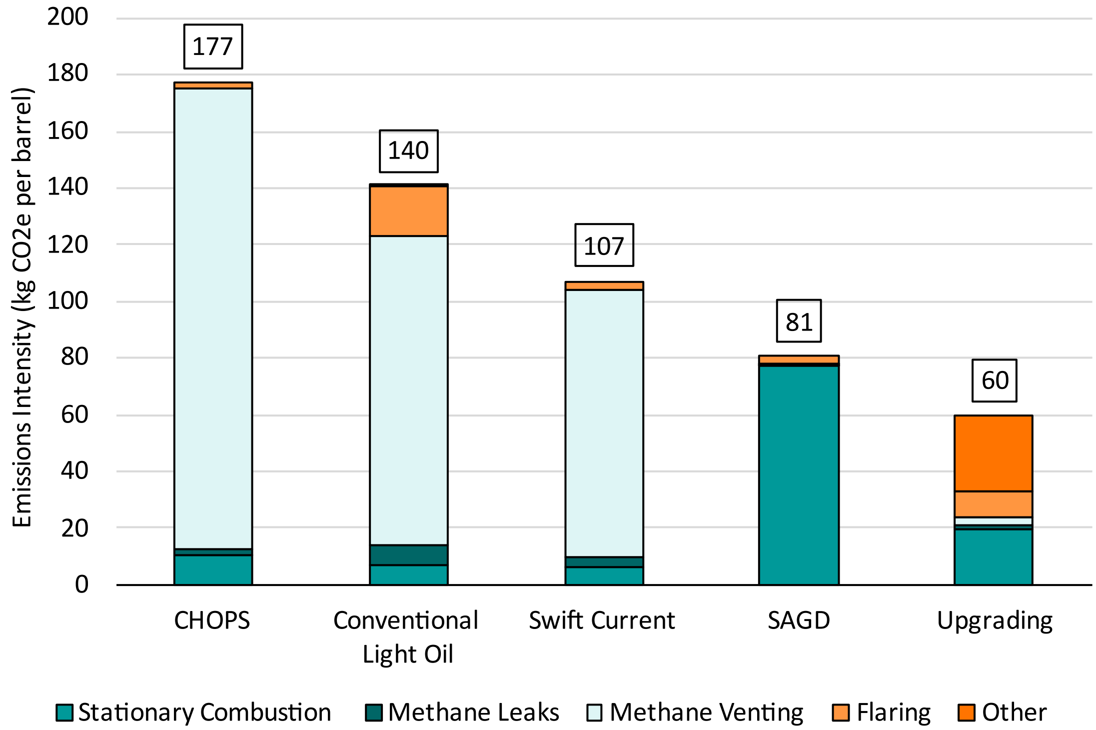
Variation within Saskatchewan's oil and gas sector means facilities will have different approaches to emissions abatement.

The oil and gas sector in Saskatchewan is heterogenous and employs several production methods. To represent this variation, this analysis separates Saskatchewan's oil and gas sector into the following subsectors:

- Conventional light oil production
- Cold Heavy Oil Production with Sand (CHOPS)
- Steam-Assisted Gravity Drainage (SAGD)
- Swift Current oil production
- Associated natural gas production
- Non-associated natural gas production

Each production type has its own emissions profile, technology mix, and production costs represented in the model. The 2020 emissions sources for each primary oil sector in Saskatchewan are presented in Figure 8.

Figure 8: Emissions intensity in key upstream oil sectors in Saskatchewan in 2020, Reference Case



Each type of production will comply with Methane 75 and the Emissions Cap in different ways, since the emissions profile and cost of emissions abatement varies by facility.

Methane 75 requires specific abatement actions for fugitive emissions, primarily from venting. The Emissions Cap covers all direct and indirect emissions from the sector, but provides some forms of flexible compliance, via offsets and allowance trading. Compliance requirements under Methane 75 and the Emissions cap are summarized in the Table below. More detail on the design of Methane 75 and the Emissions Cap in this analysis is available in Section 2.2 and Appendix B.

Table 8: Methane 75 and Emissions Cap compliance requirements

Category	Methane 75	Emissions Cap
Emissions coverage	Fugitive emissions, including methane leaks, venting and surface casing vent flows	All direct and indirect emissions from upstream oil and gas sectors
Compliance requirements	Prescriptive compliance actions: ■ Quarterly LDAR ■ Elimination of vents from devices, controllers and pumps ■ Elimination of most vented emissions from wells, compressors and tanks with newly installed combustors and vapour recovery units, as well as tank and flare stack replacements	Submit emissions allowances equal to the total annual GHG emissions in each reporting period, less emissions offset allowance. Initial allowance set based on historical emissions and GHG cap level. Additional allowances available through cap-and-trade market. Total offset allowances up to 25 $MtCO_2e$ available at \$170/tCO_2e, until exhausted Includes Methane 75 compliance requirements

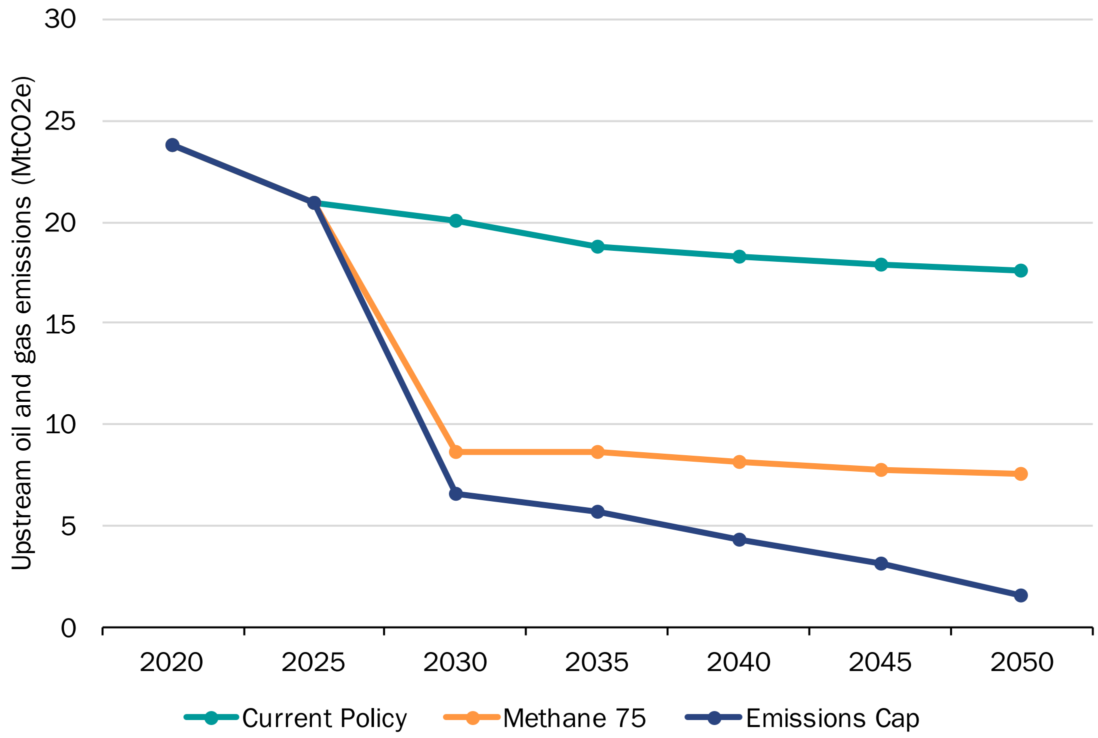
Methane 75 and the Emissions Cap generate significant emissions reductions in Saskatchewan's oil and gas sector (Figure 9).

The Methane 75 and Emissions Cap policies both lead to lower emissions from the oil and gas sector. Methane 75 yields large reductions in process emissions, such as vented and leaked methane. The compliance actions under Methane 75 are mostly sufficient to achieve the Emissions Cap in 2030. After 2030, the Emissions Cap drives additional reductions from stationary sources, such as combustion emissions from industrial heat.

Methane 75 leads to a 57% reduction in direct upstream oil and gas emissions in Saskatchewan in 2030, relative to Current Policy. Most of this reduction is from mitigating vented emissions, which accounts for most of Saskatchewan's methane emissions from the oil and gas sector. After 2030, Methane 75 does not require additional compliance actions, so there are minimal additional emissions reductions past 2030.

The Emissions Cap leads to a 67% reduction in direct upstream oil and gas emissions in Saskatchewan in 2030, relative to Current Policy. Most of this reduction is due to compliance actions required by Methane 75, which is also in place in the Emissions Cap scenario. Additional reductions beyond Methane 75 are due to reductions in stationary combustion emissions from industrial heat. Further reductions in both process and combustion emissions occur after 2030, as the Emissions Cap policy lowers the available emissions allowances towards net-zero by 2050. By 2050, emissions under the Emissions Cap are 91% below Current Policy levels.

Figure 9: Annual direct upstream oil and gas emissions in Saskatchewan, Reference Case

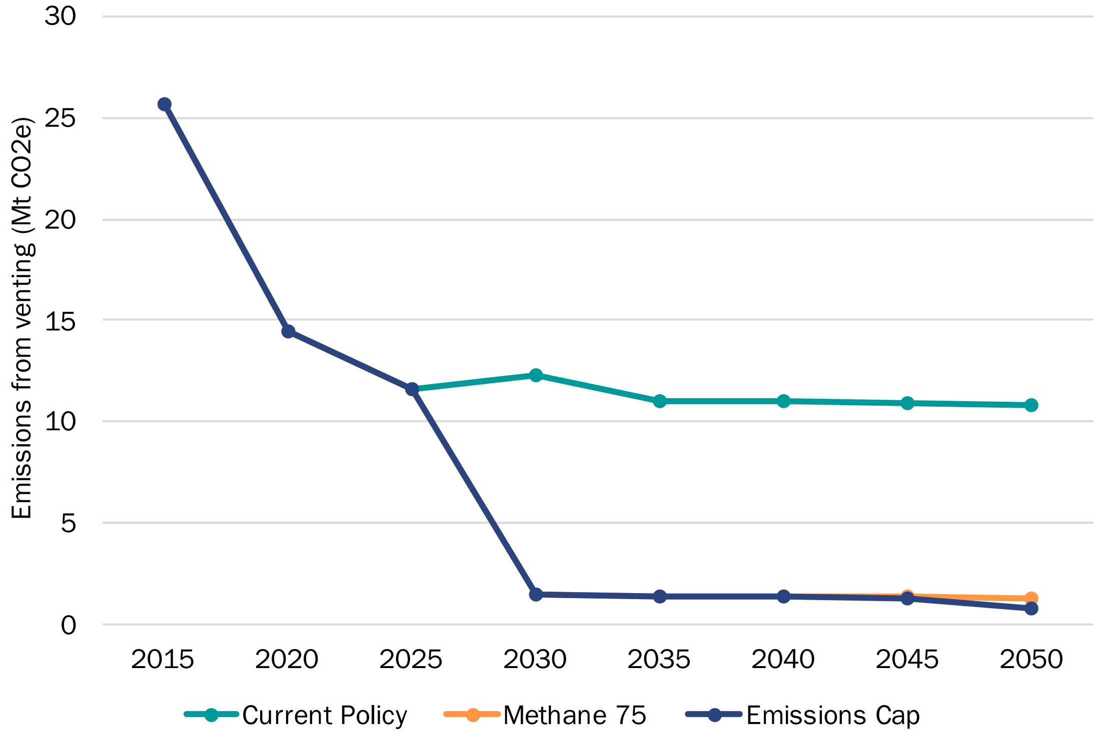


3.1.2. Process emissions

Process emissions in the oil and gas sector include all GHGs released via non-combustion processes, including leaked and vented methane, flaring and surface casing vent flows. This subset of emissions is the primary focus of the Methane 75 policy and is also covered under the Emissions Cap. In Saskatchewan, the emissions profiles of light conventional, CHOPS and Swift Current are predominantly process emissions from fugitive sources.

Emissions from venting are the predominant type of process emission in Saskatchewan's upstream oil and gas sector, and much of the abatement actions required by Methane 75 target these emissions. Figure 10 shows the change in venting emissions under Current Policy, Methane 75 and the Emissions Cap. Methane 75 results in an 89% reduction in vented emissions below Current Policy in 2030. The Emissions Cap has no additional impact on venting emissions until 2045.

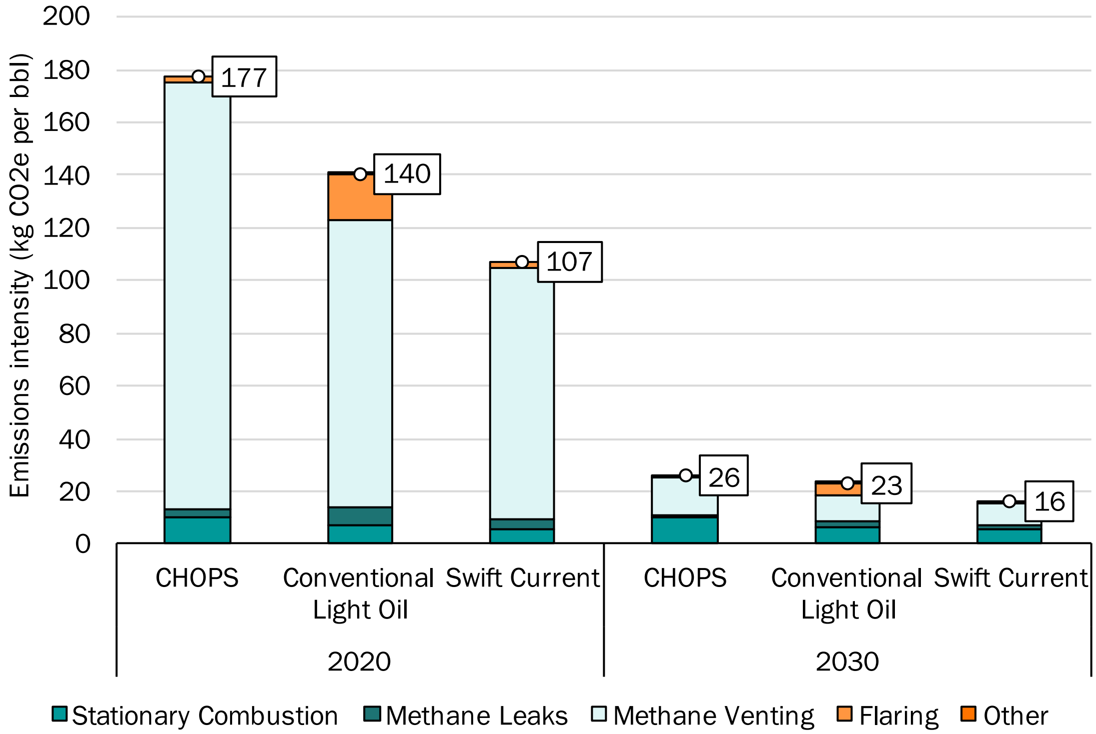
Figure 10: Emissions from venting in Saskatchewan's oil and gas sector, Reference Case



Methane 75 significantly reduces the emissions intensity of Saskatchewan's methane-intensive oil and gas production.

Improvements to methane abatement practices are responsible for lower emissions intensity in the Methane 75 scenario. Increasing LDAR frequency and implementing the suite of venting emissions compliance actions leads to dramatic reductions in the emissions intensity of light oil, CHOPS and Swift Current production. Figure 11 presents the impact of Methane 75 and other legislated policies on the change in emissions intensity of these sectors between 2020 and 2030.

Figure 11: Emissions intensity of methane-intensive oil production in Saskatchewan under Methane 75, Reference Case



In 2030 and 2040, methane abatement practices are similar in both Methane 75 and the Emissions Cap. By 2050, the Emission Cap leads to some implementation of more aggressive methane abatement practices, but most additional emissions reductions come from stationary combustion sources.

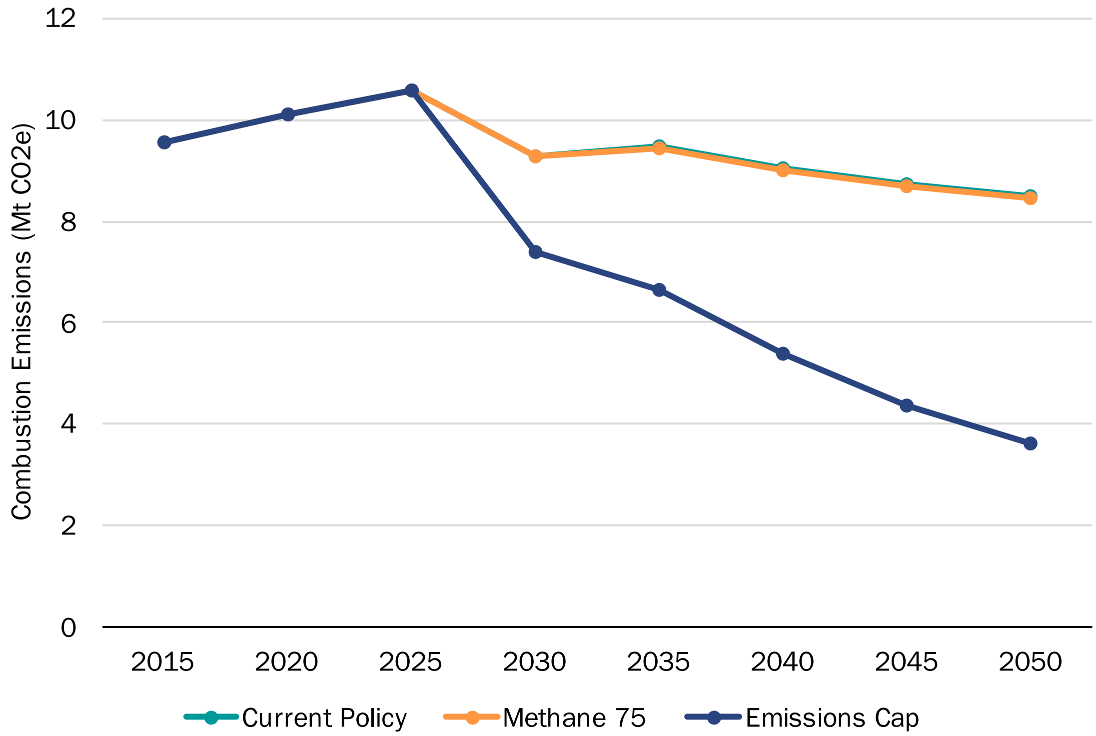
Reductions in emissions intensity help the sector comply with Methane 75 and the Emissions Cap while continuing to operate. However, the compliance costs associated with these policies will increase the cost of production. Increasing the cost of production will affect production outcomes in the sector. A detailed discussion of the policy impact on oil and gas economics, including production outcomes, is provided in Section 3.2.

3.1.3. Combustion emissions

Combustion emissions in the oil and gas sector include GHGs released via fuel combustion. This subset of emissions includes emissions from industrial heat, gas compression, heavy-duty vehicles and cogeneration. Stationary combustion for industrial heat is the predominant combustion emission in Saskatchewan's oil and gas sector.

Combustion emissions are only materially below Current Policy under the Emissions Cap. The Figure below shows all combustion emissions in Saskatchewan's oil and gas sector under each policy scenario. Most combustion emissions are not targeted by Methane 75 so combustion GHGs under this policy generally follow the same trajectory as Current Policy. The Emissions Cap yields additional emissions reductions from 2030 onwards, with a linear reduction proportionate to the increasing cap stringency. Combustion emissions under the Emissions Cap are 20% below Current Policy in 2030, 40% below in 2040, and 57% below in 2050.

Figure 12: Combustion emissions in Saskatchewan's oil and gas sector, Reference Case

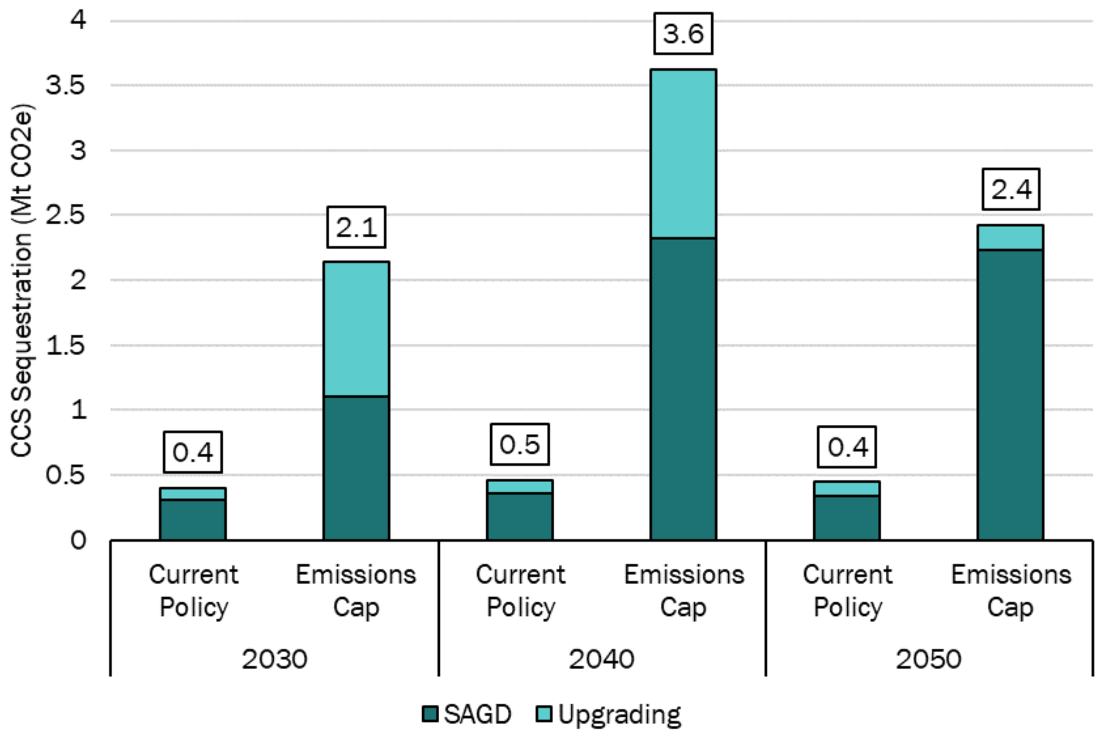


When available, CCS drives the most reductions in combustion emissions under the Emissions Cap.

The deployment of CCS is the primary abatement method deployed by SAGD and upgrading facilities in Saskatchewan. Under the Emissions Cap, 2.1 Mt CO_2e is sequestered via CCS in 2030, 3.6 Mt CO_2e in 2040, and 2.4 Mt CO_2e in 2050 (Figure 13). Total CCS sequestration declines after 2040 due to lower overall sector activity; however, 100% of dedicated industrial heat uses CCS technology in 2050, with 80% in 2040 and 32% in 2030. Deployment of CCS is similar under Methane 75 as under Current Policy, as Methane 75 does not target stationary combustion emissions.

If CCS is assumed to not be available, SAGD and upgrading facilities do not have sufficient abatement options to comply with a net-zero emissions cap by 2050. These sectors deploy electric compression, more efficient natural gas heating, and hydrogen-blending to stay operational in 2030 and 2040 but are retired by 2050 to comply with the emissions cap. Section 3.2 provides more discussion on production outcomes.

Figure 13: Amount of carbon captured in each year under Current Policy and the Emissions Cap in Saskatchewan's oil and gas sector, Reference Case



3.2. Oil and gas economics

This section details the impact of Methane 75 and the Emissions Cap on the economics of oil and gas production in Saskatchewan. Having discussed the emissions abatement pathways in Section 3.1, this section discusses the impact that compliance costs have on sector output, investment and employment.

3.2.1. Compliance costs

The actions required by oil and gas facilities to comply with Methane 75 and the Emissions Cap will lead to additional capital and operating expenditures. While results indicate the policies will create material reductions in annual emissions (Section 3.1), the sector will incur additional compliance costs that may affect sector activity.

Methane 75

Methane 75 requires a set of compliance actions to mitigate vented and leaked methane emissions in the oil and gas sector. Conventional oil production is the predominant form of production in Saskatchewan, which releases more vented and leaked methane than the oil sands in Alberta. As a result, much of Saskatchewan's oil and gas sector will be required to increase methane abatement to be in compliance with Methane 75.

The set of actions the sector takes under Methane 75 has been characterized for this analysis based on data provided by the Saskatchewan Ministry of Energy and Resources. These actions include combustor installations, flare stack replacements, quarterly LDAR frequency, and other activities. Appendix B contains additional details on the requirements under Current Policy, including OGEMR and Directive PNG036, and Methane 75.

Table 9 summarizes the incremental compliance costs and average abatement cost[35] of methane abatement in Saskatchewan's oil and gas sector under Current Policy and Methane 75. The incremental compliance costs represent the additional costs relative to methane management practices in 2015.[36]

Abatement actions under Methane 75 will incrementally reduce vented and leaked emissions in Saskatchewan's oil and gas sector by 11.0 Mt CO_2e, relative to Current

[35] Average abatement cost is defined as the total annual cost of emissions abatement divided by the total emissions reduced each year. Upfront capital costs are annualized using a discount rate of 17.5%.

[36] gTech-IESD uses 2015 as a base year, so existing methane management reflects 2015 practices.

Policy in 2030. The incremental compliance cost of the policy is $356 million (2023$) at an average abatement cost of $30.6 per tonne CO_2e (2023$).

Table 9: Cost of methane abatement under Current Policy and Methane 75, Reference Case

Sector	Current Policy[37]	Methane 75	Policy impact
Total GHG abatement ($Mt\ CO_2e$/yr in 2030)[38]	8.2	19.2	11.0
Total incremental levelized* compliance cost ($2023 million/yr in 2030)	230	586	356
Average abatement cost ($2023 per tonne CO_2e)	28.0	30.6	2.5

* levelized costs are the sum of annualized capital costs (17.5% discount rate) plus the net difference in operating and energy costs.

Emissions Cap

Compliance under the Emissions Cap is more dynamic than Methane 75, due to allowance trading and the availability of flexible compliance via offsets. This analysis explicitly simulates the cap-and-trade system and the procurement of offsets by facilities covered by the cap. An assessment of the allowance market provides insight into the cost of complying with the emissions cap.

The price for allowances under the Emissions Cap, which is also the marginal cost of abatement[39], increases as the Emissions Cap becomes more stringent. Table 10 below summarizes the price of emissions allowances under the Emissions Cap in the Reference Case and other sensitivity scenarios.

---

37 Includes the set of requirements for OGEMR and Directive PNG036, often referred to as Methane 45.

38 Excludes any abatement from shut-in production, so that the abatement cost only represents the cost of compliance actions.

39 Marginal abatement cost is defined as the cost of reducing one additional unit of emissions

Table 10: Price of emissions allowances under the Emissions Cap by sensitivity (2030$ per tonne of CO_2e)

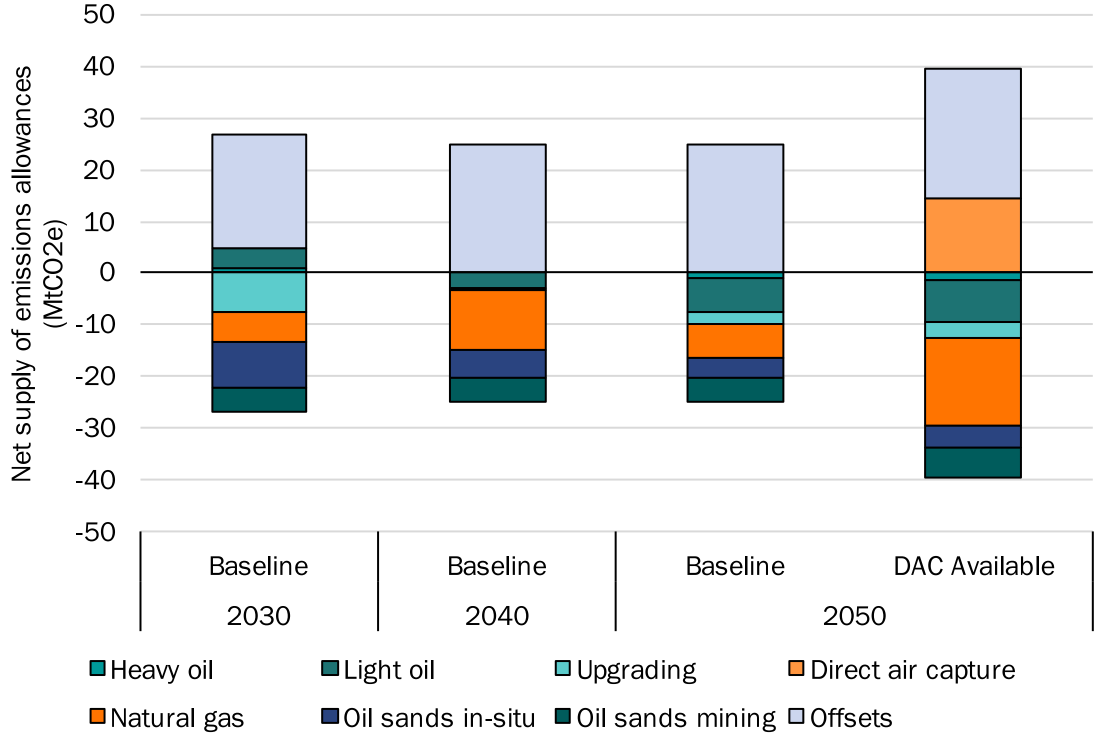
Sensitivity	2030	2035	2040	2045	2050
Reference Case	**170**	**178**	**203**	**434**	**910**
High Tech Cost	192	219	255	480	910
Low Tech Cost	110	137	170	509	1087
CNZ Oil Price	170	175	172	285	645
DAC available	170	182	204	414	488
No CCS available	559	545	550	580	809
Median price	**170**	**180**	**203**	**457**	**859**

In most sensitivities, the Emissions Cap allowance price in 2030 is set by the price of offsets, which are valued at $170 per tonne of CO_2e ($2030). After 2030, the marginal cost of compliance is set based on the most expensive abatement action required to achieve compliance with the Emissions Cap, as all offsets are exhausted. It becomes more expensive for the sector to decarbonize as the cap gets closer to net-zero emissions and facilities must increasingly deploy expensive abatement actions. This result indicates that, in most cases, the Emissions Cap does not achieve the incremental carbon price of $50 per tonne of CO_2e, as expected by ECCC, unless CCS technology is not available.

The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap. The price of Emissions Cap allowances is three times higher in 2030 and 2035 when CCS is not available (Table 10). Further, the availability of DAC has the potential to lower compliance costs in 2045 and 2050 by providing an additional source of emissions allowances.

Figure 14 below shows the net allowance position for sectors covered under the Emissions Cap, and the offsets sold in a given year. Positive values represent a net supply of emissions allowances sold on the allowance market; negative values represent a net purchase of allowances. CHOPS, Swift Current and Conventional light (the light and heavy oil categories in the figure) are all in a net surplus position in 2030, due to lower abatement costs via Methane 75, but they must procure additional emissions allowances in future years. SAGD must purchase additional emissions allowances to comply with the Emissions Cap in all model years.

Figure 14: Net supply of emissions allowances under the Emissions Cap, Canada-wide



The total compliance cost for Saskatchewan's oil and gas sector under the Emissions Cap is a function of the cost of the abatement actions deployed by the sector and the price of emissions allowances. In 2030, the compliance actions under Methane 75 are mostly sufficient to achieve the Emissions Cap, with the addition of some CCS deployment in SAGD and upgrading. In 2040 and 2050, compliance costs increase due to additional CCS deployment and allowance purchases at increasingly higher allowance prices.

3.2.2. Production

The actions required by the sector to achieve compliance under Methane 75 and the Emissions Cap will negatively affect Saskatchewan's oil and gas production. Figure 15 and Table 11 below present total primary oil production in Saskatchewan under each scenario.

- **Methane 75** will lead to a 9 thousand barrels per day (kbpd) reduction (2%) in oil and gas production by 2030, and a 16-17 kbpd (3-4%) reduction by 2050, relative to Current Policy.

- **The Emissions Cap** in 2030 will lead to a 13-15 thousand barrels per day (3%) reduction in oil and gas production by 2030; 33-51 kbpd reduction (7-11%) by 2040; and 126-176 kbpd reduction (28-39%) by 2050, relative to Current Policy.

Figure 15: Total primary oil production in Saskatchewan, Reference Case

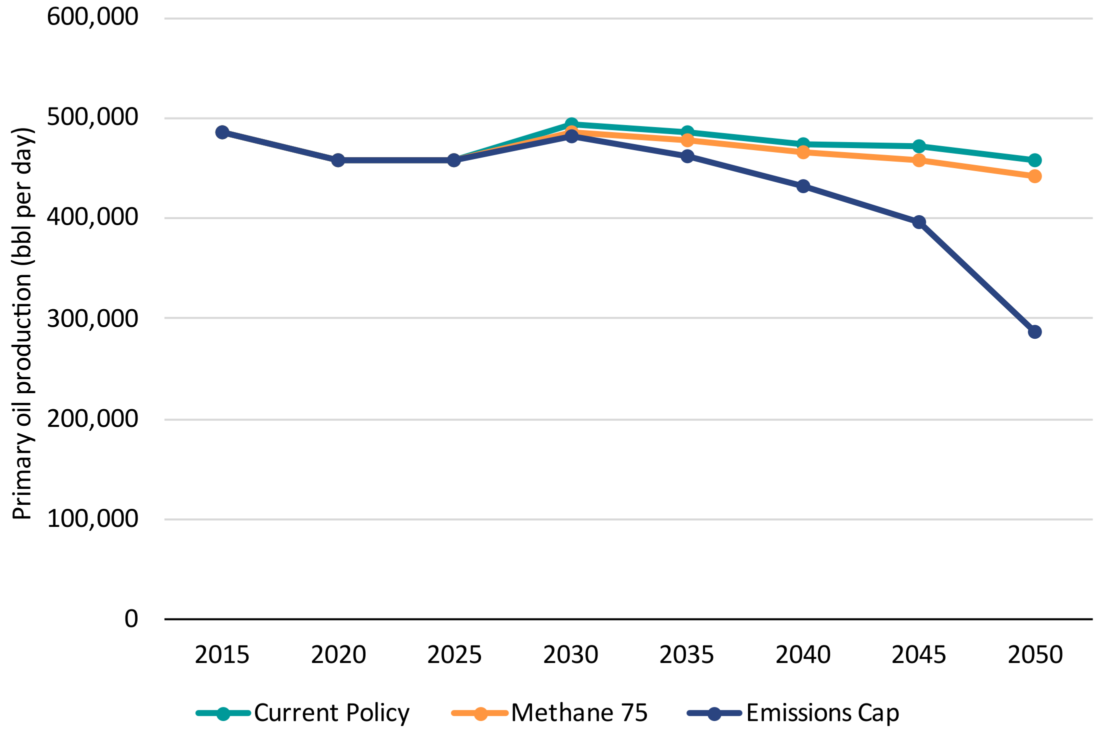


Table 11: Impact of Methane 75 and Emissions Cap on primary oil production in Saskatchewan, Reference Case

Production category	2025	2030	2035	2040	2045	2050
Total primary oil production under Current Policy	459	494	485	474	472	458
Change in oil production under Methane 75	0	-9	-7	-8	-13	-16
Change in oil production under Emissions Cap	0	-13	-24	-42	-74	-172

While total oil production in the province is lower under Methane 75 and the Emissions Cap, the magnitude of the impact depends on the type of production. Methane-intensive production - conventional light oil, CHOPS and Swift Current – have the largest reductions in production under Methane 75. Each of these production types exhibits a 2-3% reduction in production in 2030, growing to a 3-7% reduction in 2050. SAGD production is unaffected by Methane 75.

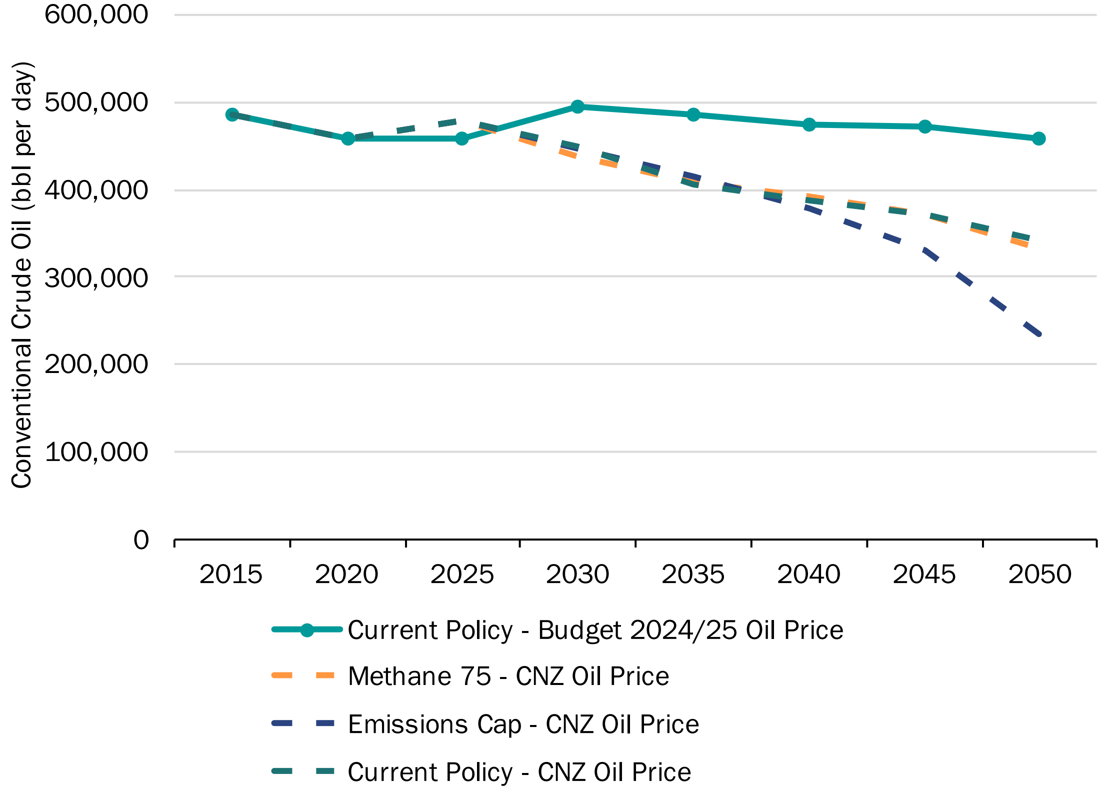
The Emissions Cap leads to lower overall production than Methane 75 in all model years as the policy leads to additional activity reduction in SAGD production. The

Emissions Cap mitigates some production losses in the methane-intensive sectors in 2030 and 2040, due to sales of emissions allowances, but the losses in SAGD production more than offset this effect. By 2050, all production types exhibit significant production cuts, with the exception of light oil via carbon dioxide enhanced oil recovery (CO_2-EOR), which benefits from the increased availability of CO_2 as SAGD and upgraders deploy CCS.

While domestic climate policy affects oil production, oil prices affect the future of the sector. Figure 16 presents primary oil production in Saskatchewan under the Budget 2024/25 oil price (WTI $65-70 per bbl, 2030-2050) and the CER Canada Net-Zero scenario oil price (WTI $58-62 per bbl, 2030-2050).

- When a lower oil price is simulated, as per the CER's Canada Net-Zer scenario, the change in oil price has a significant impact on production outcomes, even if no further domestic climate policy is introduced.
- The oil price effect can also dampen the impact of domestic climate policy on oil production. Under the Canada Net-Zero oil price, production levels are largely unaffected by domestic policy until 2045. Production levels under Current Policy, Methane 75 and the Emissions Cap remain within an 9-12 thousand barrel per day range until 2045, when the stringency of the Emissions Cap drives production incrementally lower.

Figure 16: Oil production in Saskatchewan is sensitive to global oil prices



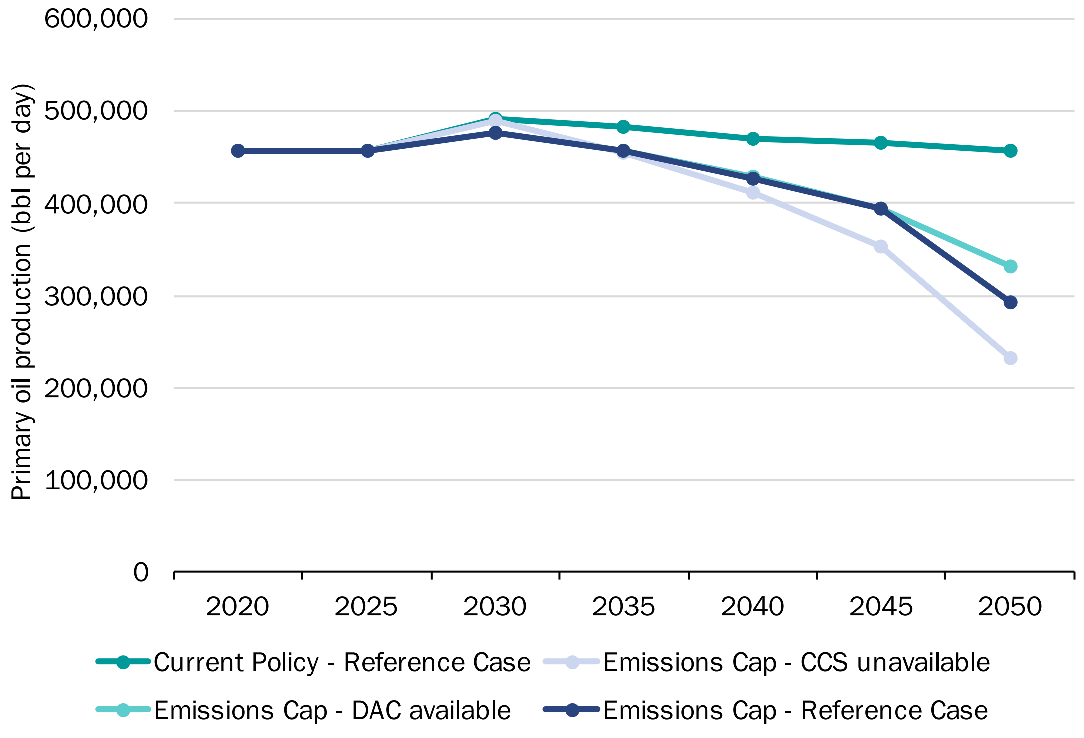
Availability of CCS is important for continued SAGD oil production under the Emissions Cap, but less important for production types without significant stationary combustion emissions. Figure 17 below shows total Saskatchewan oil production outcomes under the Emissions Cap with CCS available (Reference Case), without CCS available and with DAC available.

- When CCS is not available, SAGD production in Saskatchewan is fully retired by 2050 under the Emissions Cap. The lack of abatement options for industrial heat means it is not economically viable for this form of production to continue. The limited abatement options lead to lower SAGD production in both 2030 and 2040 relative to the Emissions Cap when CCS is available.
- When CCS is not available, production types without significant stationary combustion emissions – conventional light, CHOPS and Swift Current – initially benefit from the emissions cap due to increased cap-and-trade revenues. In 2030, these sectors sell a higher quantity of allowances at a higher market price when CCS is unavailable, which enables all three production types to increase activity beyond Current Policy levels. Consequently, total oil production in 2030 is higher when CCS is not available, even if SAGD production is lower. However, as the stringency of the

cap increases, the surplus of allowances declines and production from these sectors falls below Current Policy levels by 2050.

- The availability of negative-emissions technology, such as DAC, could mitigate some production losses. When DAC is available in the model, it is deployed in 2045 and 2050. The technology supplies additional emissions allowances which lowers the market price for allowances and reduces the volume of production shut-in in 2050.

Figure 17: SK oil production under different Emissions Cap sensitivities



3.2.3. Investment

Investment in the oil and gas sector is negatively impacted by Methane 75 and the Emissions Cap. In 2030, less capital deployment from lower production is offset by additional investment required for compliance, largely from mitigating vent and leak emissions and some investment in CCS. After 2030, the production gap leads to lower overall investment in both scenarios, despite the growth in CCS deployment under the Emissions Cap.

- **Methane 75** will have an equivalent level of investment in 2030 as under Current Policy, with losses in production offset by additional investment in compliance actions, such as installing combustors at small sites and increased LDAR survey frequency. However, the sector will have $0.2-0.3 billion ($2023) less annual investment by 2040 and 2050 relative to Current Policy, due to a lower production output requiring less capital investment.

- **The Emissions Cap** will require $0.4 billion more investment in the sector in 2030 relative to Current Policy to achieve compliance with the emissions cap. This investment is largely driven by additional compliance actions in industrial heat, including the deployment of CCS facilities with an annual capture capacity of 2.1 Mt CO_2e. However, by 2040 total investment in the sector falls below the Current Policy level, due to production shut in. Under the Emissions Cap, annual investment is $0.7 billion below Current Policy in 2040 and $3.6 billion below Current Policy in 2050.

3.2.4. Employment

Lower oil production under Methane 75 and the Emissions Cap results in lower employment in the oil and gas sector after 2030.

- In 2030, the impacts of Methane 75 and the Emissions Cap on oil and gas jobs is marginal (~100 fewer full-time equivalent jobs). Lower production leads to fewer jobs in the sector but this effect is partially offset by the additional labour required to implement compliance actions under each policy, such as increased LDAR monitoring frequency.

- Methane 75 results in a small net reduction in employment in all model years after 2030, approximately 200 fewer full-time jobs than Current Policy. The Emissions cap leads to 600 fewer jobs in 2040 and 3,000 fewer jobs in 2050 relative to Current Policy.

- There is a regional nuance to where the job losses might occur. For example, production losses under Methane 75 will likely be concentrated in regions where there are wells with relatively high venting and leaked emissions and relatively low production rates. In contrast, new jobs will occur where production continues.

3.3. Provincial economy

This section discusses economic impacts that extend beyond Saskatchewan’s oil and gas sector. In this section we explore the effects of Methane 75 and the Emissions Cap on Saskatchewan’s macroeconomy, including GDP, investment, exports and government revenue.

3.3.1. Government revenue

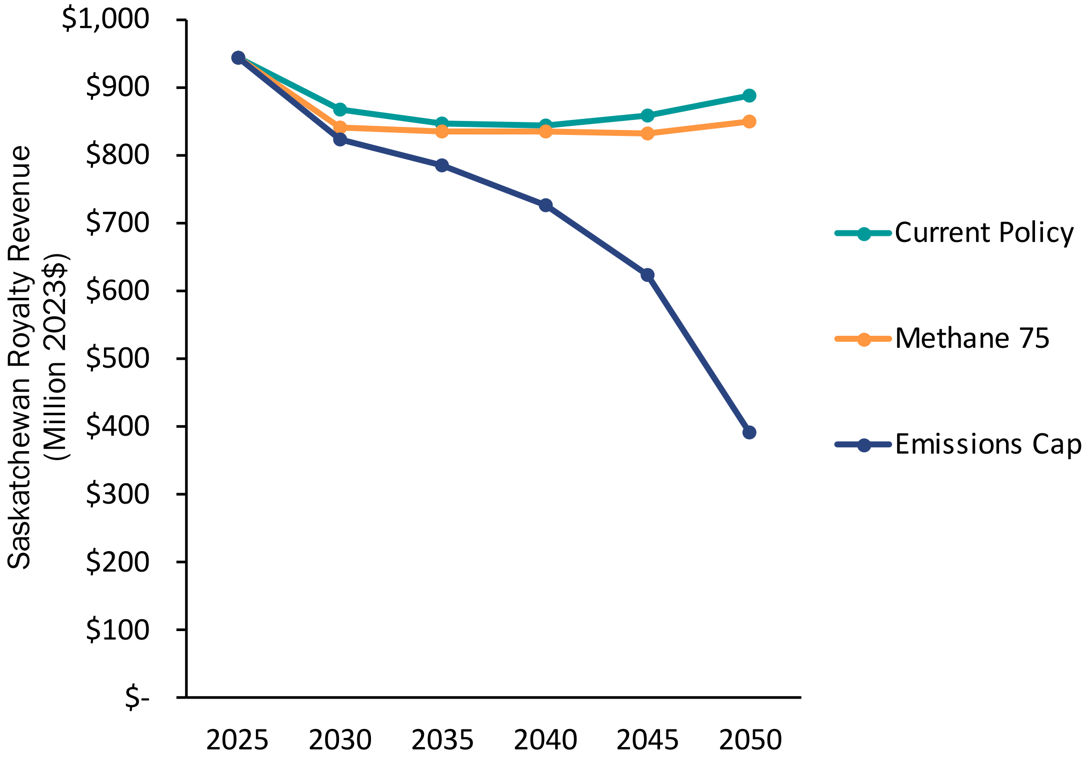
Lower oil production under Methane 75 and the Emissions Cap leads to reduced government revenue in Saskatchewan, driven primarily by lower royalty and production tax revenue.

- Under Methane 75, annual provincial and federal government revenue in Saskatchewan is $0.1 billion ($2023) below Current Policy between 2030 and 2050, with royalty and production tax revenue up to $36 million below Current Policy.
- Under the Emissions Cap, total provincial and federal government revenue in Saskatchewan is less than $0.1 billion below Current Policy in 2030, with the gap increasing to $0.5 billion in 2040 and $2.1 billion in 2050. Royalty and production taxes make up about a quarter of the total lost revenue.

Royalties

This subsection covers the impacts to provincial resource royalties under each policy scenario. Figure 18 shows total resource royalties under the reference oil price.

Figure 18: Total royalty and production tax revenue in Saskatchewan, Reference Case



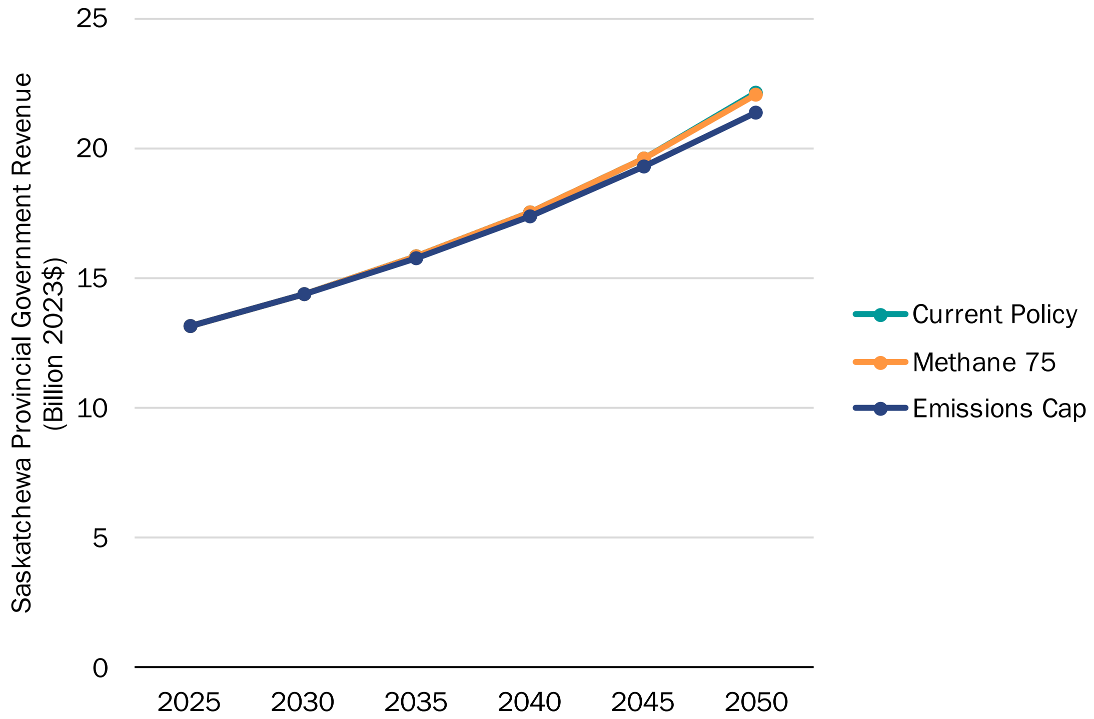
Under **Methane 75**, annual royalty revenue in Saskatchewan is between $8-$36 million lower than under Current Policy between 2030 and 2050. This impact is driven primarily by lower conventional light oil production. This decline in royalties represents a 3% decrease relative to Current Policy in 2030 and a 4% decrease by 2050.

Under the **Emissions Cap,** annual royalty revenue in Saskatchewan is $45 million below Current Policy in 2030, with the gap increasing to $116 million in 2040 and $495 million in 2050. This is caused by significantly decreased production across oil and gas sectors under the Emissions Cap. This decline in royalties represents a 5% decrease relative to Current Policy in 2030, and a 56% decrease by 2050.

Provincial government revenue

Provincial government revenue includes all provincial taxes, including freehold taxes and resource royalty revenues. Figure 19 shows Saskatchewan provincial government revenue under each policy scenario assuming a reference oil price. Provincial government revenue continues to grow in all scenarios but at varying rates.

Figure 19: Total provincial government revenue in Saskatchewan, Reference Case



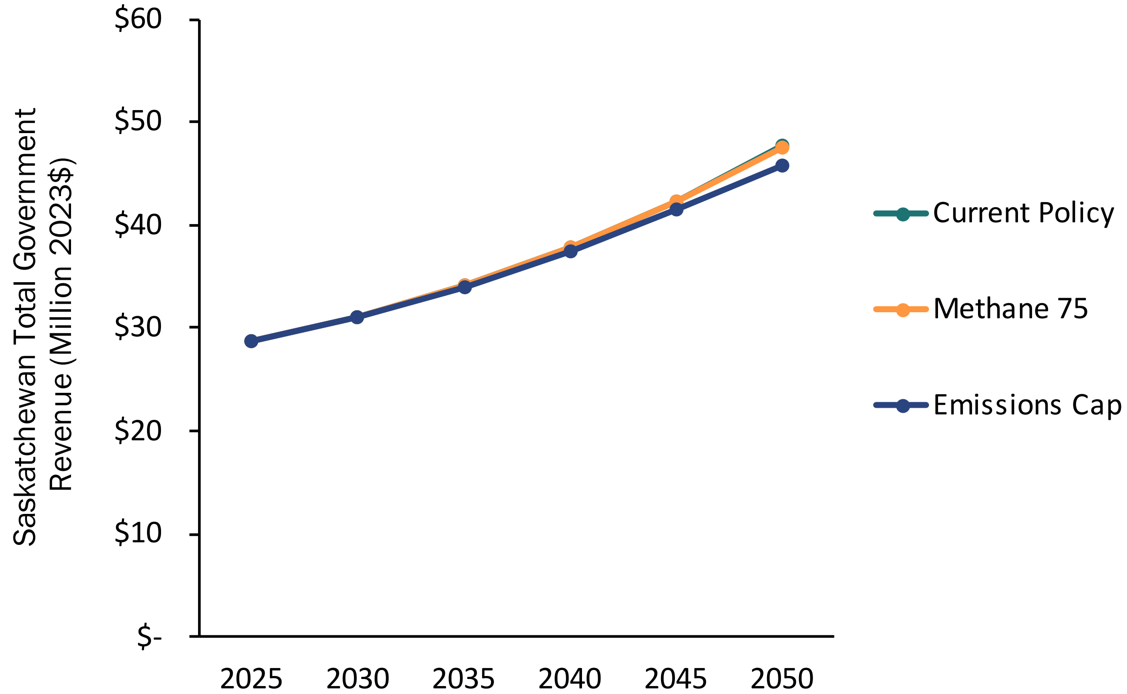
Under **Methane 75**, provincial government revenues are between $42-$91 million lower than under Current Policy between 2030 and 2050. This impact is driven by a combination of decreased royalty revenues and decreased tax revenues from lower economic activity. This decline in revenues represents a 0.4% decrease relative to Current Policy in 2050.

Under the **Emissions Cap,** provincial government revenues are $26 million lower than under Current Policy in 2030, with the gap increasing to $297 million in 2040 and $1.3 billion in 2050. The decline in provincial revenue in 2050 represents a 5.6% decrease relative to Current Policy.

Total government revenue

Total government revenue includes all federal taxes collected from Saskatchewan, in addition to Saskatchewan provincial government taxes and resource royalty revenue. Figure 20 shows Saskatchewan total government revenue under each policy scenario assuming a reference oil price of $65-70 per barrel (WTI $2022 US). Federal government revenue continues to grow in all scenarios but at varying rates.

Figure 20: Total government revenue in Saskatchewan, Reference Case



Under **Methane 75**, total government revenues from Saskatchewan continue to grow, but are between $55-$136 million lower than under Current Policy between 2030 and 2050. This decline in revenues represents a 0.3% decrease relative to Current Policy in 2050.

Under the **Emissions Cap,** total government revenues from Saskatchewan also grow but are $9 million below Current Policy in 2030, with the gap increasing to $482 million in 2040 and $2.1 billion in 2050. This decline in revenues represents a 4.3% decrease relative to Current Policy in 2050.

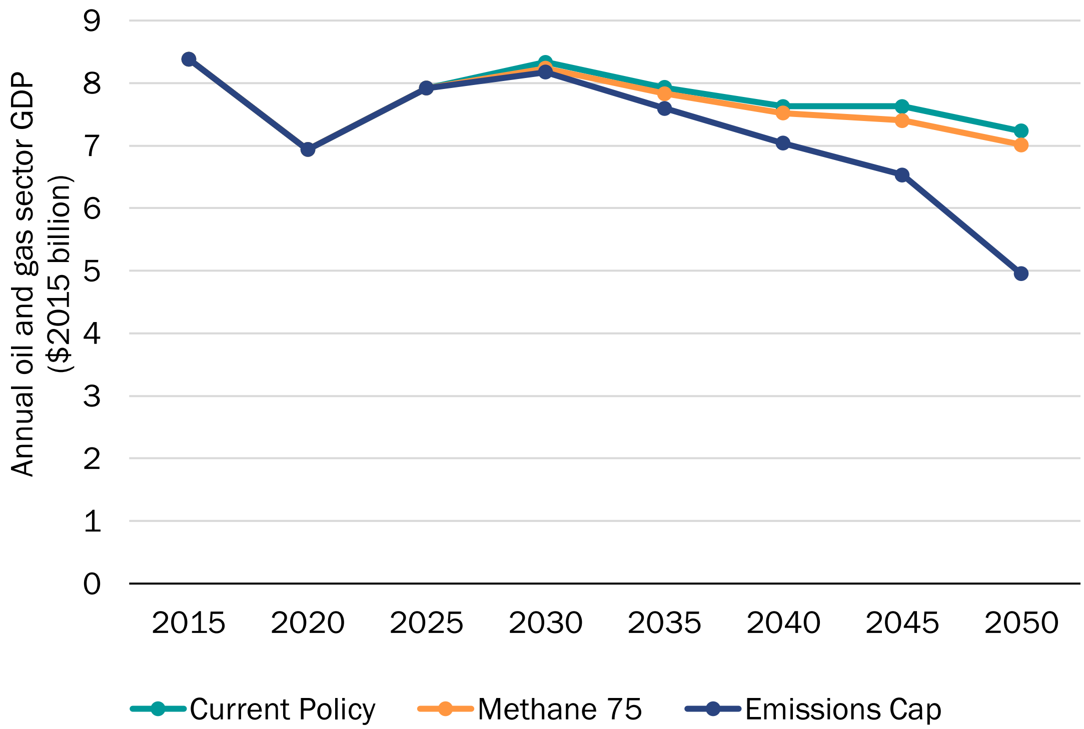
3.3.2. Macroeconomy

Oil and gas sector GDP under each scenario follows a similar trend to production outcomes. Figure 21 shows oil and gas sector GDP in Saskatchewan under each scenario. Methane 75 leads sector GDP to fall $0.1 billion (1%) below Current Policy in 2030 and 2040, and $0.2 billion (3%) in 2050. The Emissions Cap leads sector GDP to fall $0.2 billion (2%) below Current Policy in 2030, $0.6 billion (8%) in 2040 and $2.3 billion (32%) in 2050.

Saskatchewan exports fewer goods and services under Methane 75 and the Emissions Cap relative to Current Policy, driven primarily by lower oil product exports. Annual oil exports are consistently $0.2-$0.4 billion lower than Current Policy under Methane 75.

Under the Emissions Cap, oil exports are $0.3 billion less than under Current Policy in 2030, $0.9 billion less in 2040, and $5.6 billion less in 2050 (2015$).

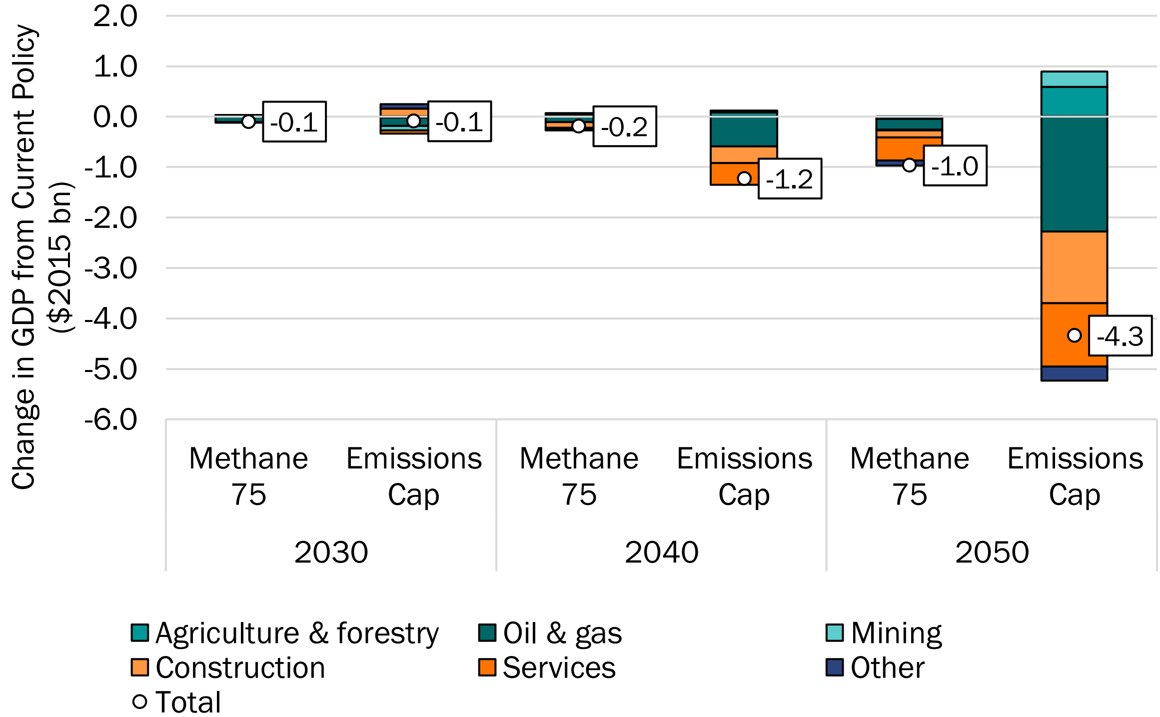
Figure 21: Annual oil and gas sector GDP in Saskatchewan, Reference Case



Economy-wide GDP grows under all scenarios between now and 2050. However, Methane 75 and the Emissions Cap reduce Saskatchewan's GDP growth. Figure 22 presents the difference in GDP from Current Policy for the Methane 75 and Emissions Cap scenarios.

Table 12 presents sectoral GDP in Saskatchewan in 2030 and 2050 under all three scenarios.

Figure 22: Change in annual GDP from Current Policy, Reference Case



- Under **Methane 75**, Saskatchewan's economy is $0.1 billion (0.1%) ($2015) smaller relative to Current Policy between 2025 and 2030, and $1.0 billion (0.7%) smaller between 2025 and 2050. Lower GDP growth is driven by slower growth in the oil and gas and construction sectors due to lower oil production and the link between oil sector output and construction activity.

- Under **the Emissions Cap**, Saskatchewan's economy is $0.1 billion (0.1%) smaller relative to Current Policy between 2025 and 2030, and $4.3 billion (3.1%) smaller between 2025 and 2050. Growth slows mostly in the oil and gas sector, but the construction and services sectors also exhibit lower cumulative GDP by 2040 and 2050.

The impact of the Emissions Cap extends beyond the oil and gas sector, while Methane 75 has minimal impact on other sectors of the economy. The Emissions Cap leads to re-allocation of factor inputs to other sectors of the economy, with the impacts most pronounced in 2050 (Figure 22). Construction GDP increases slightly under the Emissions cap relative to the Current Policy scenario in the 2025-2030 timeframe, due to increased investment in CCS, but has slower growth in 2025-2040 and 2025-2050 timeframe. There is a decrease in GDP in the construction (15%) and pipeline transportation (28%) sectors in 2050 relative to Current Policy, driven by the decrease in oil and gas activity. GDP growth from the services sector is slower in all timeframes, reflecting lower overall economic activity. Some sectors, such as agriculture and mining, increase their overall GDP contribution relative to Current Policy by 2050 due to increased demand for biofuels. There is an increase in hydrogen sector GDP of over 50% and biofuels grows by 8% under the Emissions Cap relative to Current Policy, although the overall size of these sectors remains small (contributing a combined $0.13 billion (C2015$) in 2050 under the Emissions Cap).

Table 12: Annual GDP by sector and scenario, Reference Case (C$2015 billion)

Sector	2030			2050		
	Current Policy	Methane 75	Emissions Cap	Current Policy	Methane 75	Emissions Cap
Agriculture & forestry	10.4	10.4	10.3	17.1	17.1	17.7
Oil & gas	8.3	8.2	8.2	7.2	7.0	5.0
Mining	6.9	6.9	6.8	8.0	8.0	8.3
Construction	7.5	7.5	7.7	9.6	9.5	8.2
Services	46.5	46.5	46.4	81.9	81.4	80.6
Other	11.4	11.4	11.5	16.2	16.1	15.9
Total	**91.1**	**91.0**	**91.0**	**140.0**	**139.0**	**135.6**

4. Key insights

Insight 1: Methane 75 and the Emissions Cap create material reductions in oil and gas sector emissions, but the sector will incur additional compliance costs that may affect sector activity.

- Abatement actions under Methane 75 will reduce vented and leaked emissions in Saskatchewan's oil and gas sector by 11.0 Mt CO_2e in 2030, relative to Current Policy. The incremental levelized compliance cost of the policy is $356 million per year (2023$) in 2030, at an average abatement cost[40] of $30.6 per tCO_2e.
- The price for allowances under the Emissions Cap, which represents the marginal cost of abatement[41] in the sector, is $148 per tCO_2e in 2030[42], $177 per tCO_2e in 2040, and $693 per tCO_2e in 2050 ($2023). The average abatement cost in Saskatchewan under the Emissions Cap will be lower than the allowance price, due to lower cost abatement options, such as those required under Methane 75.

Insight 2: Achieving compliance with Methane 75 and the Emissions Cap will impact Saskatchewan's oil and gas production, investment and employment.

- Oil production under Methane 75 will be 2-4% below Current Policy between 2030 and 2050. Production under the Emissions Cap is similar to Methane 75 in 2030 but declines further as the policy brings the sector closer to net-zero emissions in 2050 – 7-11% below Current Policy in 2040 and 28-39% below Current Policy in 2050.
- Oil and gas investment under Methane 75 is equal to that of Current Policy in 2030 due to compliance investments offsetting reduced production capital. Investment is higher under the Emissions Cap in 2030, thanks to additional investment in CCS technology. However, oil and gas investment in both scenarios is consistently below Current Policy after 2030.
- Emissions Cap impacts after 2030 are based on the assumption that emissions allowances decline linearly to achieve net-zero emissions by 2050. ECCC indicate in the December 2023 Regulatory Framework that the policy will be aligned with net-zero emissions by 2050 but does not indicate how that would be achieved.

---

[40] Average abatement cost is defined as the total annual cost of emissions abatement divided by the total emissions reduced each year. Upfront capital costs are annualized using a discount rate of 17.5%.

[41] Marginal abatement cost is defined as the cost of reducing one additional unit of emissions

[42] This is equivalent to $170 per tCO2e in 2030 dollars

Insight 3: Reduced oil and gas production under Methane 75 and the Emissions Cap leads to lower government revenue and slower economic growth in Saskatchewan

- In 2030, royalty and production tax revenue is 3% below Current Policy under Methane 75 and 5% below Current Policy under the Emissions Cap. Under the Emissions Cap, the revenue gap grows to 14% below Current Policy in 2040 and 56% below Current Policy in 2050.
- GDP growth is positive in all scenarios but lower growth under both Methane 75 and the Emissions Cap results in $0.3 billion less cumulative GDP relative to Current Policy between 2025 and 2030. Between 2025 and 2050, the difference in cumulative GDP relative to Current Policies is $11.9 billion under Methane 75 and $35.4 billion under the Emissions Cap.

Insight 4: Oil prices are an important factor in driving production outcomes. Under the Canada Net-Zero sensitivity, production outcomes are driven more by a lower global oil price than either the Methane 75 or Emissions Cap policies. In 2030 and 2040, production outcomes are similar in all three scenarios when assuming a low oil price.

Insight 5: The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap. The price of Emissions Cap allowances increases three-fold in 2030 and 2035 if CCS is not available. Further, the availability of DAC has the potential to lower compliance costs in later years (2045 and 2050), which could help the sector mitigate some production shut-in as the Emissions Cap level approaches net-zero emissions.

Appendix A: Legislated federal and provincial policies

This Appendix provides additional detail on the set of legislated policies simulated in this analysis. The tables below summarize federal policies (Table 13), Saskatchewan policies (Table 14) and other provincial policies (Table 15).

Federal policies

Table 13: Federal policies included in gTech-IESD

Policy	Description
Carbon pricing	
Fuel Charge[43]	The federal government implemented a federal fuel charge as a backstop policy that applies a tax on fossil fuels in provinces that don't have an equally stringent carbon pricing system. The federal fuel charge currently applies in all provinces and territories, except for British Columbia, Québec, and the Northwest Territories, who have equivalent carbon pricing systems on consumer fuels. The federal government announced that the federal fuel charge will be annually increased by $15/tCO$_2$e after 2022 until the tax reaches $170/tCO$_2$e in 2030 and stays constant in nominal terms thereafter. In our modeling, costs are assumed to be passed through to fuel prices in full.
Output-Based Pricing System[44,45]	In combination with the federal fuel charge, the federal government also developed the Output-Based Pricing System (OBPS) as a backstop policy applied to industrial emissions. The backstop price is set as per the same schedule as the fuel charge, i.e. increasing by $15/tCO$_2$e annually until reaching $170/tCO$_2$e in 2030. The OBPS is a tradable emissions performance standard that puts a price on industrial emissions. If a facility's emissions intensity

[43] Government of Canada. (2021). The federal carbon pollution pricing benchmark. Available from: https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/carbon-pollution-pricing-federal-benchmark-information.html.

[44] Government of Canada. (2021). Review of the OBPS Regulations: Consultation paper. Available from: https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/2022-review-consultation.html

[45] ADD Provincial References if needed.

Policy	Description
	exceeds the sectoral benchmark, they can comply by paying a compliance charge or by purchasing a tradeable credit from a facility below its benchmark. The federal OBPS currently applies in Manitoba, Prince Edward Island, the Yukon, and Nunavut. Provincial/territorial governments in BC, Alberta, Saskatchewan, Ontario, New Brunswick, Nova Scotia, Newfoundland and Labrador, and the Northwest Territories have implemented provincial/territorial carbon pricing systems for large final emitters. Québec's cap and trade system covers industrial emissions. Key features include: ▪ Most sectoral benchmarks in the federal OBPS annually increase in stringency by 2 percentage points starting in 2023. Provincial/territorial systems have established tightening rates that vary by province and sector. ▪ The electricity sector has technology-specific benchmarks out to 2030. Electricity generation units are assumed to pay a carbon price of $170/t in real terms after 2030. ▪ OBPS proceeds are used to fund low-carbon technologies for industrial sectors. ▪ Eligible opt-in facilities are assumed to opt-in. ▪ Banking and borrowing of credits is not included.
Multi-sectoral	
Investment tax credit for Carbon Capture, Utilization, and Storage[46]	This policy is an investment tax credit for 50% of upfront costs for carbon capture, utilization, and storage, 60% for Direct Air Capture, and 37.5% for related transportation infrastructure capital investments. The government expects this policy to cost about $2.6 billion dollars between 2022 and 2026, and $1.5 billion annually from 2027 to 2030. The tax credit rates will be reduced by 50% starting in 2031 and phased out after 2040.
Tax Credit for Clean Hydrogen Investment[47]	Budget 2023 introduces details on the Clean Hydrogen Investment Tax Credit (ITC), which subsidizes eligible project costs by between 15% and 40%, depending on the life cycle carbon intensity (CI) of the hydrogen produced.

[46] Government of Canada. (2022). Budget 2022. Tax Measures: Supplementary information. Available from: Archived - Tax Measures: Supplementary Information | Budget 2022 (canada.ca).

[47] Government of Canada. (2023). Budget 2023. Available from: https://www.budget.canada.ca/2023/pdf/budget-2023-en.pdf

Policy	Description
	The ITC will cover between 15% and 40% of eligible project costs, with the projects that produce the cleanest hydrogen receiving the highest levels of support (assuming labor requirements are met): ■ 40% for hydrogen with a CI smaller 0.75 kg/kg H2 ■ 25% for hydrogen with a CI between 2kg and 0.75kg ■ 15% for hydrogen with a CI between 4kg and 2kg ■ 0% for hydrogen with a CI greater 4kg The tax credit is phased out starting in 2034, whereby property that becomes available for use in 2034 can receive half the credit rate and property that becomes available after 2034 can no longer receive the tax credit.
Tax Credit for Clean Technology Investment[48]	The 2022 Fall Economic Statement and Budget 2023 provide details on the Clean Technology Investment Tax Credit. The Tax Credit refunds 30% of capital investments by taxable entities (e.g., excluding Crown Corporations) in low-carbon electricity (including nuclear), electricity storage systems, low-carbon heat and electricity equipment, and industrial off-road zero emission vehicles. It is available for technologies purchased between 2023 and 2034.
Tax Credit for Clean Electricity Investment[49]	In addition to the 30% investment tax credit (ITC) for taxable entities, Budget 2023 introduces a 15% ITC for eligible investments made by non-taxable entities (e.g., Crown Corporations). The ITC is available for investments in non-emitting electricity systems, including nuclear and abated natural gas, storage, and interprovincial transmission equipment. The tax credit is available for projects constructed between 2023 and 2034.
Canada Infrastructure Bank Spending[50]	The Healthy Environment and Healthy Economy federal climate plan states that the Canada Infrastructure Bank (CIB) has a long-term investment target of $5 billion for clean power projects. It further outlines that the CIB has committed $1.5 billion for zero emission buses, $2.5 billion for low-carbon power projects, including storage, transmission, and renewables, over 3 years, and $2 billion for

48 Government of Canada. (2023). Budget 2023. Available from: https://www.budget.canada.ca/2023/pdf/budget-2023-en.pdf

49 Government of Canada. (2023). Budget 2023. Available from: https://www.budget.canada.ca/2023/pdf/budget-2023-en.pdf

50 Government of Canada. (2020). A Healthy Environment and a Healthy Economy. Available from: https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf & Government of Canada. (2022). 2030 Emissions Reduction Plan. Available from: https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/erp/Canada-2030-Emissions-Reduction-Plan-eng.pdf

Policy	Description
	commercial building retrofit upfront costs. The ERP mentions that CIB will receive a total of $35 billion with priorities to invest in green infrastructure ($5 billion), public transit ($5 billion) and clean power ($5 billion). Budget 2023 announced that the CIB will invest at least $10 billion through its Clean Power priority area, and at least $10 billion through its Green Infrastructure priority area.
Low carbon fuel fund[51]	The Healthy Environment and Healthy Economy Plan and Budget 2021 announced that $1.5 billion will be provided over five years to support the production and use of low carbon fuels.
Buildings	
Energy efficiency regulations[52]	Federal standards exist for space conditioning equipment, water heaters, household appliances, and lighting products. Major standards include a minimum annual fuel utilization efficiency of 95% for natural gas furnaces, a minimum energy factor of 0.61 for gas water heaters and ban of incandescent light bulbs.
Greener Homes Grant[53]	$2.6 billion for residential energy efficiency improvements over seven years. 700,000 grants of up to $5,000 to help homeowners make energy efficient retrofits to their homes.
Greener Homes Loan Program[54]	Budget 2021 also allocated $4.4 billion on a cash basis ($778.7 million on an accrual basis over five years, starting in 2021-22, with $414.1 million in future years), to the Canada Mortgage and Housing Corporation to provide interest-free loans up to $40,000 to low-income homeowners for home retrofits. Budget 2022 allocates an additional investment of $458.5 million into the low-income loan program.
Increase energy efficiency in community buildings[55]	The A Healthy Environment and a Healthy Economy plan proposed to invest $1.5 billion over three years for repairs and efficiency

[51] Government of Canada. (2021). Budget 2021. Available from: https://www.budget.gc.ca/2021/home-accueil-en.html

[52] Natural Resources Canada. (n.d.). Canada's Energy Efficiency Act and Energy Efficiency Regulations. Available from: www.nrcan.gc.ca/energy/regulations-codes-standards/6861

[53] Government of Canada. (2020). Fall Economic Statement. Supporting Canadians and Fighting Covid-19. Available from: https://www.budget.gc.ca/fes-eea/2020/report-rapport/toc-tdm-en.html

[54] Government of Canada. (2021). Budget 2021. Available from: https://www.budget.gc.ca/2021/home-accueil-en.html & Government of Canada. (2022). Budget 2022. Available from: https://budget.gc.ca/2022/report-rapport/chap1-en.html#2022-1

[55] Government of Canada. (2020). A Healthy Environment and a Healthy Economy. Available from: https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf

Policy	Description
	upgrades in community buildings and for building new energy efficient community buildings.
Transportation	
Clean Fuel Regulation[56]	The Clean Fuel Regulation is a performance-based fuel supply standard with annual reduction requirements. The regulations require liquid fossil fuel suppliers to reduce the lifecycle greenhouse gas intensity (CI) of their fuels, starting with 3.5 gCO_2e/MJ in 2023 and increasing annually until reaching 14 g CO_2e/MJ in 2030. Note that this policy is not included in the set of Current Policies calibrated to in SK gTech-IESD. However, it can be included in the SAPP and SK CER scenarios.
Zero Emissions Vehicle (ZEV) Mandate.	The Government of Canada committed to achieve 100% zero-emission vehicle sales by 2035 for all new light -duty vehicles, including interim targets of at least 20% by 2026 and at least 60% by 2030.[57]
Regulations Amending the Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations[58]	The national government has proposed amending the Heavy-Duty Vehicle Emissions Standard to increase the vehicle emission stringency for vehicles manufactured in model years 2018 to 2027.
Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations[59]	New passenger vehicles and light-commercial vehicles/light trucks sold in Canada must meet fleet-wide GHG emission standards between 2012 and 2016, and between 2017 and 2025. Fleet targets for passenger cars are aligned with US regulation.
Renewable Fuels Regulation[60]	Specifies a minimum renewable content of 5% for gasoline and 2% for diesel, by volume. This will become part of the Clean Fuel Regulation (CFR) once the CFR comes into force in 2023.

[56] Government of Canada. (2022). Clean Fuel Regulations: SOR/2022-140. Canada Gazette, Part II, Volume 156, Number 14. Available from: https://www.gazette.gc.ca/rp-pr/p2/2022/2022-07-06/html/sor-dors140-eng.html

[57] Government of Canada. (2024). Amendment to *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations.* Available from: https://laws-lois.justice.gc.ca/eng/regulations/sor-2010-201/index.html

[58] Government of Canada. (2018). Regulations Amending the Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations and Other Regulations Made Under the Canadian Environmental Protection Act, 1999: SOR/2018-98. http://gazette.gc.ca/rp-pr/p2/2018/2018-05-30/html/sor-dors98-eng.html

[59] Government of Canada. (2018). Regulations Amending the Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations. http://www.gazette.gc.ca/rp-pr/p2/2014/2014-10-08/html/sor-dors207-eng.html

[60] Government of Canada. (2013). Renewable Fuels Regulations: SOR/2010-189. Available from: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-189/index.html

Policy	Description
Light-Duty ZEV Subsidy[61]	Light-duty vehicle subsidies are available at $2,500 for short-range plug-in hybrids and $5,000 for long-range plug-in hybrids, hydrogen vehicles, and battery electric vehicles. The government committed an additional $1.7 billion over five years, starting in 2022-23, with $0.8 million in remaining amortization, to Transport Canada to extend the Incentives for Zero-Emission Vehicles (iZEV) program until March 2025.
Heavy-Duty Zev Subsidy[62]	Funding of $547.5 million over four years, starting in 2022/23, will be available to Transport Canada to launch a new purchase inventive program for medium- and heavy-duty zero-emission vehicles which provides rebates of up to $200,000.
ZEV Charging Infrastructure Subsidy[63]	Federal funding of $400 million over five years, starting in 2022/23, is committed to funding the deployment of zero-emission vehicle (ZEV) charging infrastructure in sub-urban and remote communities through the Zero-Emissions Vehicle Infrastructure Program (ZEVIP).
Large Truck Retrofits[64]	The ERP includes a $199.6 million subsidy for retrofitting large trucks currently on the road.
Electricity Generation	
Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations[65]	This policy requires coal-fired power plants to be closed by 2030 unless they emit less than 420 tonnes CO_2e/GWh.
Regulations Limiting Carbon Dioxide Emissions from	This policy limits the emissions intensity of natural gas fired electricity generation to 420 tonnes CO_2e/GWh.

[61] Government of Canada. (2022). Eligible vehicles. Available from: https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/light-duty-zero-emission-vehicles/eligible-vehicles.

[62] Government of Canada. (2022). Medium and heavy-duty zero-emission vehicles. Available from: https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/medium-heavy-duty-zero-emission-vehicles .

[63] Government of Canada. (2022). Budget 2022. Available from: https://budget.gc.ca/2022/report-rapport/chap1-en.html#2022-1

[64] Environment and Climate Change Canada. (2022). 2030 EMISSIONS REDUCTION PLAN Canada's Next Steps for Clean Air and a Strong Economy. Available from: En4-460-2022-eng.pdf (publications.gc.ca)

[65] Government of Canada. (2018). Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations: SOR/2018-263. Available from: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2012-167/page-2.html#h-4

Policy	Description
Natural Gas-fired Generation of Electricity[66]	
Renewable Electricity Investments[67]	Budget 2021 allocated $964 million over four years for renewable electricity generation. An additional $600 million will be invested in renewable electricity and grid modernization and $250 million to support large clean electricity projects.
Industry	
Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds[68]	Oil and gas facilities must adopt methane control technologies and practices.
Net Zero Accelerator[69]	A Healthy Environment and a Healthy Economy announced an investment of $3 billion over 5 years for the Net Zero Accelerator, which provides funding for development and adoption of low-carbon technologies in all industrial sectors. Budget 2021 provided an additional $5 billion over seven years for the Net Zero Accelerator.

Saskatchewan policies

Saskatchewan provincial policies included in the model are described below.

66 Government of Canada. (2018). Regulations Limiting Carbon Dioxide Emissions from Natural Gas-fired Generation of Electricity: SOR/2018-261. Available from: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-261/index.html

67 Government of Canada. (2021). Budget 2021. Available from: https://www.budget.gc.ca/2021/home-accueil-en.html & Government of Canada. (2020). A Healthy Environment and a Healthy Economy. Available from: https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf

68 Government of Canada. (2020). Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector): SOR/2018-66. Available from: https://laws-lois.justice.gc.ca/eng/regulations/SOR-2018-66/index.htm

69 Government of Canada. (2021). Budget 2021. Available from: https://www.budget.gc.ca/2021/home-accueil-en.html.

Table 14: Saskatchewan policies included in gTech-IESD

Province	Policy	Description
Saskatchewan	Saskatchewan Output Based Performance Standard	Saskatchewan's provincial OBPS program. The performance standards set in gTech-IESD have been developed in conjunction with the Saskatchewan Ministry of Environment.
Saskatchewan	Oil and Gas Emissions Management Regulations (OGEMR)[70]	Regulations requiring Saskatchewan's upstream oil and gas industry to reduce emissions from venting and flaring by over 40 per cent between 2020-2025. Sector requirements modelled based on data from Ministry of Energy and Resources.
Saskatchewan	Boundary Dam Carbon Capture Project[71]	This project stores and captures CO_2 emissions from a 115 MW coal plant.
Saskatchewan	Ethanol Fuel (General) Regulations[72]	Regulation requiring a minimum renewable fuel content of 7.5% for gasoline by volume.
Saskatchewan	The Renewable Diesel Act[73]	Requirement for a minimum renewable content in diesel of 2%.

Other provincial policies

Other provincial policies included in the model are described below.

Table 15: Provincial policies included in gTech-IESD

Province	Policy	Description
Alberta	Renewable Electricity Act[74]	Legislation establishing a target that 30% of electricity produced in Alberta come from renewable sources by 2030. Interim targets of 15% by 2022, 20% by 2025, and 26% by 2028 have been established.

[70] Government of Saskatchewan. (2019). Oil and Gas Emissions Management Regulations. Available from: https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/environmental-protection/oil-and-gas-emissions-management

[71] SaskPower. (2019). Boundary Dam Carbon Capture Project. Available from: https://www.saskpower.com/our-power-future/infrastructure-projects/carbon-capture-and-storage/boundary-dam-carbon-capture-project

[72] Government of Saskatchewan. (2020). Ethanol Fuel (General) Regulations (E-11.1 Reg 1). Available from: https://publications.saskatchewan.ca/#/products/1064.

[73] Government of Saskatchewan. (2011). *The Renewable Diesel Act (Chapter R-10.001).*

[74] Alberta. (2020). Renewable Electricity Act. Statutes of Alberta, 2016 Chapter R-16.5. Available from: https://www.qp.alberta.ca/1266.cfm?page=r16p5.cfm&leg_type=Acts&isbncln=9780779814060.

Province	Policy	Description
Alberta	Carbon capture and storage investments[75]	Alberta has contributed funding to several CCS projects, including the Shell Canada Energy Quest Project and the Alberta Carbon Trunk Line.
Alberta	Renewable Fuels Standard[76]	Alberta requires a minimum annual average of 5% and 2% renewable content in gasoline and diesel respectively.
British Columbia	Clean Energy Act[77]	A minimum of 93% of provincial electricity generation must be provided by clean or renewable sources. The Clean BC Roadmap to 2030[78]. announced plans to increase electricity from renewable sources to 100% of supply by 2030 through phase out of remaining gas-fired facilities by 2030.
British Columbia	Low Carbon Fuel Requirement Regulation (part of the Low Carbon Fuel Standard)[79]	British Columbia introduced this policy in 2008. This regulation requires a decrease in average carbon intensity of transportation fuels by 10% by 2020 and by 30% by 2030 relative to 2010. Fuel suppliers can meet the second requirement by acquiring credits generated from fueling electric vehicles. The Clean BC Roadmap to 2030[78]. announced plans to expand coverage to marine and aviation fuels.
British Columbia	Zero Emission Vehicle Standard[80]	Requires a minimum share of light-duty vehicles sold in BC to be zero-emission. This mandate achieves 10% electric vehicles sales by 2025, 30% by 2030 and 100% by 2040. The Clean BC Roadmap to 2030[78]. announced plans to accelerate the light-duty ZEV sales targets under the ZEV mandate to 26% by 2026, 90% by 2030 and 100% by 2035.

[75] Natural Resources Canada. (2018). Shell Canada Energy Quest Project. Available from: www.nrcan.gc.ca/energy/funding/cef/18168. & Natural Resources Canada. (2016). Alberta Carbon Trunk Line (ACTL). Available from: www.nrcan.gc.ca/energy/publications/16233.

[76] Alberta Regulation 29/2010. (2020). *Renewable Fuels Standard Regulation.* Available from: https://www.alberta.ca/renewable-fuels-standard-resources

[77] Government of British Columbia. (2010). Clean Energy Act. Available from: http://www.bclaws.ca/civix/document/id/lc/statreg/10022_01

[78] British Columbia. (2021). cleanBC. Roadmap to 2030. Available from: https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_roadmap_2030.pdf

[79] Government of British Columbia. (2020). Greenhouse Gas Reduction (Renewable and Low Carbon Fuel Requirements) Act, SBC 2008, c. 16. Available from: https://www.bclaws.ca/civix/document/id/complete/statreg/08016_01

[80] Government of British Columbia. (2019). Zero-Emission Vehicle Act. SBC 2019, Chapter 29. Available from: https://www.bclaws.ca/civix/document/id/complete/statreg/19029

Province	Policy	Description
British Columbia	Light-Duty ZEV subsidies[81]	Provides incentives at $1,500 for short-range plug-in hybrids and $3,000 for long-range plug-in hybrids, battery electric vehicles, and hydrogen vehicles. It is unclear how long the incentives will be available for; the province has extended the policy multiple times since funding ran out since its introduction.
British Columbia	Technology and Retrofit Incentive Programs[82]	Programs offering incentives for energy efficiency measures in residential, commercial, and industrial buildings. CleanBC Better Homes programs include rebates for households including the Indigenous Community Heat Pump Incentive (funding for heat pump installation in residential and community buildings in Indigenous communities), rebates for heat pumps, electric service upgrades, and new construction programs for the construction of high-performance electric homes. The Better Buildings program provides incentives for commercial buildings including: support for upgrades, heating equipment conversions, low interest financing and ISO 5001 incentive (co-managed with federal government), and implementation of energy management systems in industrial facilities.
British Columbia	PST Exemption[83]	Use of electricity in residential and industrial buildings is exempt from provincial sales tax.
British Columbia	Industrial Electrification[78]	Supply electricity to power natural gas extraction in the Peace region, and other large industrial operations.
British Columbia	Organic waste diversion[84]	Divert 95% of organic waste from landfills.
British Columbia	Landfill Gas Management Regulation	Simulated as a requirement to reduce landfill methane emissions by 75%.

[81] Government of British Columbia. (2020). Go Electric Passenger Vehicle Rebates. Available from: https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/clean-transportation-policies-programs/clean-energy-vehicle-program/passenger-vehicles

[82] cleanBC. Better Homes. Available from: https://betterhomesbc.ca/ & cleanBC. Better Buildings. Available from: https://betterbuildingsbc.ca/.

[83] Government of British Columbia. (2017). Provincial Sales Tax (PST). Tax Rate. Available from: https://www2.gov.bc.ca/gov/content/taxes/sales-taxes/pst.

[84] Government of British Columbia (n.d.) *About Climate Change - Waste*. Available from; https://cleanbc.gov.bc.ca/about-climate-change/drivers/waste/

Province	Policy	Description
Manitoba	Biofuels Mandate Amendment[85]	Renewable fuel content requirement at 10% for gasoline and 5% for diesel by volume.
Manitoba	Coal phase-out[86]	Manitoba Hydro phased out its last coal-fired generating unit in 2018.
Manitoba	Keeyask Hydro-electricity Project[87]	A hydro project with a capacity of a 695-megawatt (MW).
New Brunswick	Renewable Portfolio Standard[88]	The renewable portfolio standard requires NB Power to ensure that 40% of in-province electricity sales are from renewable energy by 2020. Imports of renewable energy from other jurisdictions qualify for compliance, as do energy efficiency improvements.
Newfoundland and Labrador	Muskrat Falls Hydro Project[89]	A hydro project with a capacity of 824 MW.
Nova Scotia	Cap on GHG emissions from electricity generation[90]	This policy requires emissions from the electricity sector to decline to 4.5 Mt by 2030.
Nova Scotia	Renewable Portfolio Standard[91]	This renewable portfolio standard requires that 25% of electricity consumption be provided from renewable resources in 2015, increasing to 40% by 2020 and 80% in 2030.
Nova Scotia	Maritime Link[92]	This transmission line will connect Nova Scotia to hydroelectric generation from Newfoundland Labrador (and in particular, to the Muskrat Falls hydroelectric project).
Ontario	Coal Phase-out[93]	Ontario phased out its last coal-fired generating unit in 2014. In 2019, approximately 94% of

85 Government of Manitoba. (2020). Biofuels Mandate and Renewable Fuels in Manitoba. Available from: https://reg.gov.mb.ca/detail/3340256

86 Manitoba Hydro. (n.d.). Generation Stations. Available from: https://www.hydro.mb.ca/corporate/facilities/generating_stations/

87 Manitoba Hydro. (n.d.). Keeyask Generating Station. Available from: https://www.hydro.mb.ca/projects/keeyask/

88 Government of New Brunswick. (2015). New Brunswick Regulation 2015-60 under the Electricity Act (O.C. 2016-263). Available from: www.gnb.ca/0062/acts/BBR-2015/2015-60.pdf

89 Naclor Energy. (2019). Muskrat Falls Project: Project Overview. https://muskratfalls.nalcorenergy.com/project-overview/

90 Government of Nova Scotia. (2013). Greenhouse Gas Emissions Regulations made under subsection 28(6) and Section 112 of the Environment Act. Available from: www.novascotia.ca/JUST/REGULATIONS/regs/envgreenhouse.htm

91 Government of Nova Scotia. (2020). Renewable Electricity Regulations made under Section 5 of the Electricity Act. Available from: https://novascotia.ca/just/regulations/regs/elecrenew.htm

92 Emera Newfoundland & Labrador. (2014). Maritime Link. Available from: http://www.emeranl.com/en/home/themaritimelink/overview.aspx

93 Government of Ontario. (2020). The End of Coal. Available from: https://www.ontario.ca/page/end-coal#:~:text=Ontario%20enshrined%20its%20commitment%20in,to%20generate%20electricity%20in%20Ontario & https://www.opg.com/powering-ontario/our-generation/biomass/

Province	Policy	Description
		Ontario's electricity generation was emissions free. Commitments were made under the Cessation of Coal Regulation (2007) and Ending Coal for Cleaner Air Act (2015). In 2014, the Atikokan Generating Station was converted from coal to biomass.
Ontario	Nuclear Power-plant Refurbishment[94]	Refurbishment of 10 nuclear power plants which together will provide more than 9,800 MW emissions-free capacity. Long term project in place that has been ongoing since 2016.
Ontario	Cleaner Transportation Fuels: Renewable Content Requirements for Gasoline and Diesel Fuels (O. Reg 663/20)[95]	Regulation specifying a minimum renewable fuel content of 4% for diesel, by volume. Renewable diesel life cycle GHG emissions are required to be at least 70% lower than standard petroleum diesel. Specifies a minimum renewable fuel content for gasoline of a specified amount, which increases each calendar year: 11% in 2025, 13% in 2028, 15% in 2030. Gasoline must have an average of 50% less life cycle GHG emissions than standard petroleum gasoline (previously was 45%). This is a new regulation as of November 25, 2020, that replaces the now revoked O. Reg. 535/05 (Greener Gasoline) and O. Reg. 97/14 (Greener Diesel).
Ontario	Steel project decarbonization investments[96]	Two major steel companies in Ontario, ArcelorMittal and Algoma, announced that they will upgrade their steel plants, which will result in greenhouse gas reductions of about 3 Megatonnes in each plant.

[94] Government of Ontario. (2018). Chapter 2. Ensuring a Flexible Energy System. Available from: https://www.ontario.ca/document/ontarios-long-term-energy-plan-2017-order-council-21202017/chapter-2-ensuring-flexible-energy-system#section-8

[95] Ontario. (2020). Increasing renewable content in fuels. Available from: https://ero.ontario.ca/notice/013-4598#:~:text=Regulatory%20impact%20statement,of%20greenhouse%20gas%20emission%20reductions.

[96] ArcelorMittal. (2021). ArcelorMittal and the Government of Canada announce investment of CAD$1.765 billion in decarbonisation technologies in Canada. Available from: https://corporate.arcelormittal.com/media/press-releases/arcelormittal-and-the-government-of-canada-announce-investment-of-cad-1-765-billion-in-decarbonization-technologies-in-canada & Algoma. (2021). Government of Canada Endorses Algoma Steel's Transformation Plan for Green Steel. Commitment of up to $420 Million. Available from: https://algoma.com/government-of-canada-endorses-algoma-steels-transformation-plan-for-green-steel-commitment-of-up-to-420-million/ & Government of Canada. (2022). Government investing in Hamilton's steel industry to support good jobs and significantly reduce emissions. Available from: https://www.canada.ca/en/innovation-science-economic-development/news/2021/07/government-investing-in-hamiltons-steel-industry-to-support-good-jobs-and-significantly-reduce-emissions.html

Province	Policy	Description
Québec	Renewable Natural Gas Regulation[97]	This regulation requires a minimum renewable fuel content of 1% in distributed natural gas in Québec as of 2020, rising to 2% in 2023, and 5% in 2025. A recently developed amendment will increase the minimum renewable fuel content to 7% in 2028 and 10% in 2030.
Québec	Biofuels mandate[98]	In 2019, Québec released a draft regulation that would require a minimum blend of 10% renewable fuel in gasoline and 2% in diesel by volume starting in 2021 and rising to 15% for gasoline and 4% for diesel by 2025.
Québec	Zero Emission Vehicle Standard[99]	Automakers that sell over 4,500 vehicles in the province are required to meet a minimum zero-emission vehicle credit quota. The credit requirement is set to rise from 3.5% in 2018 to 22% of non-ZEV sales by 2025. A recently developed amendment will change the credit accounting system and ZEV sales targets for the years 2025 and thereafter. Under the revised system, the sale of one new light-duty zero emission vehicle equals one credit. The minimum sales targets for post 2025 have been set to increase from 12.5% in 2025 to 65% in 2030 and 100% in 2035.
Québec	Electric Vehicle Incentives[100]	Provides incentives between $4,000 and $8,000 for the purchase of a zero-emission vehicle.
Québec	Québec New Oil Heating Ban[101]	The province is banning the installation of oil heating systems in new buildings starting 2021

[97] Gouvernement du Québec. (2019). Québec encadre la quantité minimale de gaz naturel renouvelable et met en place un comité de suivi. Available from https://www.quebec.ca/nouvelles/actualites/details/quebec-encadre-la-quantite-minimale-de-gaz-naturel-renouvelable-et-met-en-place-un-comite-de-suivi#:~:text=Il%20pr%C3%A9cise%20%C3%A9galement%20la%20progression,5%20%25%20%C3%A0%20compter%20de%202025. & Gazette Officielle Du Québec, 22 juin 2022, 154e année, no 25. Règlement modifiant le Règlement sur le prélèvement du Comité paritaire de l'entretien d'édifices publics, région de Montréal. Available from: https://cdn-contenu.quebec.ca/cdn-contenu/environnement/territoire/Documents/AIR_PojetRG_Quantite_gaz_naturel_renouvelable_MERN.pdf?1655990587

[98] Gouvernement du Québec. (2019). Projet de règlement. Volume minimal de carburant renouvelable dans l'essence et le carburant diesel. Available from: https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/energie-ressources-naturelles/publications-adm/lois-reglements/allegement/PR_Volume_minimal_carburant_renouvelable_MERN.pdf?1570737693.

[99] Québec. (2017). chapter A-33.02, r. 1. Available from: https://www.legisquebec.gouv.qc.ca/en/document/cr/A-33.02,%20r.%201/ & Gazette Officielle Du Québec, January 26, 2022, Vol. 154, No. 4. Available from: http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=1&file=105485.pdf

[100] Gouvernement du Québec. (2019). Discover electric vehicles. Available from: http://vehiculeselectriques.gouv.qc.ca/english/

[101] Gouvernement du Québec. (2022). Plan De Mise En Œuvre 2022-202. Available from: https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-mise-oeuvre-2022-2027.pdf?1652278896

Province	Policy	Description
		and the installation in existing buildings will start in 2023.
Québec	Québec Chauffez Vert Program[102]	Québec is expecting to spend 179 million between 2022 and 2027 on the Chauffez vert program, which provides financial support for replacing oil or propane heating with a renewable heating system.
Saskatchewan	Boundary Dam Carbon Capture Project[103]	This project stores and captures CO_2 emissions from a 115 MW coal plant.
Saskatchewan	Ethanol Fuel (General) Regulations[104]	Regulation requiring a minimum renewable fuel content of 7.5% for gasoline by volume.
Saskatchewan	The Renewable Diesel Act[105]	Requirement for a minimum renewable content in diesel of 2%.

[102] Québec. (2022). Plan pour une économie verte 2030. Plan de mise en œuvre 2022 2027. Available from: https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/environnement/publications-adm/plan-economie-verte/plan-mise-oeuvre-2022-2027.pdf?1652278896 & Québec. (n.d.). Chauffez vert. Available from: https://transitionenergetique.gouv.qc.ca/en/residential/programs/chauffez-vert

[103] SaskPower. (2019). Boundary Dam Carbon Capture Project. Available from: https://www.saskpower.com/our-power-future/infrastructure-projects/carbon-capture-and-storage/boundary-dam-carbon-capture-project

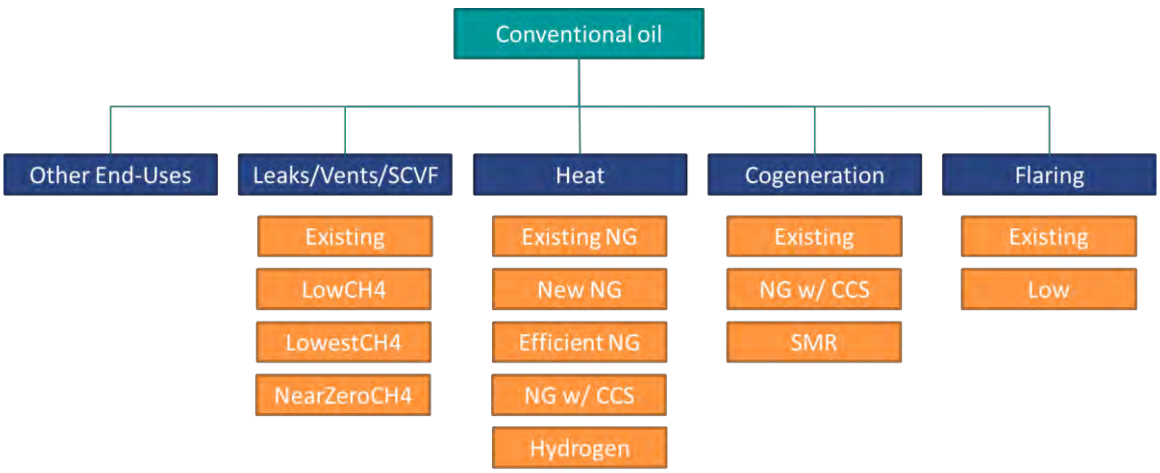
[104] Government of Saskatchewan. (2020). Ethanol Fuel (General) Regulations (E-11.1 Reg 1). Available from: https://publications.saskatchewan.ca/#/products/1064.

[105] Government of Saskatchewan. (2011). *The Renewable Diesel Act (Chapter R-10.001).*

Appendix B: Technoeconomic assumptions

gTech-IESD uses a technology choice module to simulate decision-making of firms and households. Each sector has a set of end-uses that it must satisfy to produce a unit of output.[106] Within each end-use, sectors can choose from a set of technology options. The Figure below captures the set of end-uses and technology options in the conventional oil sectors, with the end-uses in blue and technologies in orange; the abatement options in orange represent archetypal actions/technologies or baskets of actions/technologies, such as for leaks and vents.

Figure 23: Conventional oil end-uses and technologies



Methane abatement technologies

Oil and gas sectors have a series of methane management end-uses, representing emissions from venting, leaks, and surface casing vent flows. Within each end-use there are methane management 'technologies', each with an emissions intensity and cost associated with it. These archetypes represent actions taken by the sector to reduce methane emissions and can be customized to a specific set of actions, such as those expected to be required by the Methane 75 regulations.

When simulating command-and-control methane management policy, we generally force sectors to adopt/retire certain technologies, i.e. methane management practices.

[106] Some end-uses, such as cogeneration and heat, are interchangeable.

For this analysis, we will model a scenario where methane management practices for leaks and venting in the oil and gas sector are amended in 2030 in response to Methane 75.

The Tables below summarize the costs and actions of gTech-IESD's methane management technology archetypes, as well as requirements of key methane policies, including the Oil and Gas Emissions Management Regulations (OGEMR) and Directive PNG036 and Methane 75.

Methane leak detection and repair (LDAR)

The Table below presents the parameters behind the leak detection and repair (LDAR) technologies in gTech-IESD. The technologies were parameterized based on data provided by the Saskatchewan Ministry of Energy and Resources (ER) in Spring 2023.

- Inputs are expressed on a per tonne of methane managed basis (either leaked or not leaked)
- Energy content of conserved gas is based on the mass of methane not leaked
- The value of conserved gas is a simulated value and a function of the netback to producers (i.e., net of royalties, transport, and processing costs)
- Capital costs do not include any investment for sites expected to shut due to economics (discussed more with respect to vents)

Table 16: Leaks technology parameters

Description	Operating cost, 2020 CAD/tCH4	Addt'l natural gas output, GJ	CO2 emissions, tonnes/tCH4 managed	CH4 emissions, tonnes/tCH4 managed	Sites	Phase out in 2030
2015 baseline practices	-	0	0.00	1.00		Yes
Bi-annual	96	8	0.00	0.86	12,595 non-associated gas facilities	Yes. Required by directive PNG036 in 2025
Quarterly	739	20	1.98	0.17	12,595 non-associated gas facilities and 27,590 associated gas facilities	No. Required by Methane 75
Monthly	1,252	23	2.31	0.03 (80% below quarterly based on tripling frequency)	Same as above	No. Not required by Methane 75. Available to the sector if needed

Table 17 presents unit costs that make up the LDAR technology costs in gTech-IESD.

Table 17: LDAR costs used to characterize the gTech model

	Associated Gas Sites	Non-associated Gas Sites
Capital cost, $/site/yr	966	743
Addt'l repair cost, $/site/yr	289	223

Venting emissions

As with LDAR technologies, the methane venting archetypes have been changed based on data provided by ER:

- Most vented emissions are related to stranded gas venting and flaring and vents from compressors and tanks. The sources account for about 91% of the vented methane emissions, based on the 2024 National Inventory Report (NIR).
- The remainder of vented emissions are primarily from pneumatic devices and pumps.
- Many vented emissions come from sites with marginal economics: Wells that could shut if required to invest in combustors.
- Vented emissions include a substantial component of non-methane organic compounds. These are not GHG emissions when vented but produce fossil-CO_2 when combusted.

Vent abatement actions in gTech can be summarized as follows:

- **Baseline practices**: Based on a base-year 2015
- **Mitigation of vents in response to OGMER**: Represented An installation of combustors at a subset of facilities resulting in about 3% reduction in total vented methane emissions, as per the 2024 NIR.
- **Methane 75 compliance**: About 98% methane abatement, half from the prevention of vents and the other half from low-production facilities with high methane emissions intensity that would likely cease to produce rather than investing in the necessary equipment.

We also account for the resulting CO_2 emissions from combustors. The gTech-IESD inputs for the emissions impact of combustors are summarized in the Table below.

Methane combustion yields CO_2, as does the combustion of other non-methane organic gas species. Abatement of venting GHG emissions with combustors reduces methane emissions but increases CO_2. If the combusted gas were only methane, then each tonne of methane avoided would produce 2.74 tonnes CO_2. However, each tonne of methane is associated with a certain amount of ethane, propane, butane etc. (Saskatchewan weighted average used for gas species). Combustion of these additional gases means each tonne of methane and associated gases yields 4.2 tonnes CO_2 (net CO_2e abatement around 85%).

Table 18: Navius inputs for the GHG Impact of combustors are consistent with the emissions factors used by Saskatchewan:

	Venting, CO_2e	Combustor, CO_2e	% GHG abatement

GHG impact in the gTech model, per tCH4 managed	28	4.2	85%

Venting abatement accounts for avoided GHG when wells shut. ER's expectation is that some wells will shut rather than install the necessary equipment to comply with Methane 75. This expectation is built into the abatement archetypes. Navius' assumption for defining the number of facilities that shut-in and the associated change in emissions and production is that these facilities would need to achieve at least a five-year payback on their investment in methane mitigation equipment. The facilities above this cut-off account for about 6% of annual oil production but roughly half of the venting and flaring GHG emissions. This results in additional GHG abatement beyond what would be achieved from the investment in combustors and other low-emissions equipment.

Table 19: Venting technology parameters

Description	Capital cost, 2020 CAD/tCH4	Operating cost, 2020 CAD/tCH4	Addt'l natural gas output, GJ	CO2 emissions, tonnes/tCH4 managed	CH4 emissions, tonnes/tCH4 managed	Phase out in 2030
2015 baseline practices	-	-			1.00	Yes
OGMER compliance	86	5		0.12	0.972	Yes
Methane 75 compliance	1252	52	4.3	1.78	0.02	No, required by Methane 75

Notes on parameters:

- Inputs are expressed on a per tonne of methane managed basis (either vented or not vented)
- Capital costs do not include any investment for sites expected to shut due to economics
- Energy content of conserved gas is based on the mass of methane not vented and only for avoided vents associated with pneumatic devices, pumps and other equipment as well as avoided compressor vents at facilities with sales gas lines
- The value of conserved gas is a simulated value and a function of the netback to producers (i.e., net of royalties, transport and processing costs)

Carbon capture and storage

CCS technology costs are a key uncertainty in the abatement potential and cost for the upstream oil and gas sector. The Tables below summarize the proposed CCS cost sensitivities we will implement for this analysis, for both the first of a kind and nth of a kind facility. The reference, low and high costs correspond with the Reference Technology Costs, Low Technology Costs and High Technology Costs sensitivities referenced in Section 2.2.2.

Table 20: First of a kind levelized costs of CCS (2020$ CAD/tCO_2 captured)

CCS Application	Reference	Low	High
Baseline natural gas with CCS for industrial heat generation	230	133	273
Baseline natural Gas with CCS for low- temperature industrial heat	230	133	273
Natural gas co-generation with CCS	230	161	256
Carbon capture and storage with SMR hydrogen production	102	66	137
Carbon capture and storage formation CO_2 from natural gas processing	50	37	62

Table 21: Nth of a kind levelized costs of CCS (2020$ CAD/tCO_2 captured)

CCS Application	**Reference**	**Low**	**High**
Baseline natural gas with CCS for industrial heat generation	156	90	185
Baseline natural Gas with CCS for low- temperature industrial heat	156	90	185
Natural gas co-generation with CCS	166	117	187
Carbon capture and storage with SMR hydrogen production	98	64	131
Carbon capture and storage formation CO_2 from natural gas processing	48	36	60

Table 22: First of a kind levelized costs of abated electricity generation (2020$ CAD/tCO_2 captured)

CCS Application	Reference	Low	High
Abated coal generation with CCS	71	38	85
Abated gas generation with CCS	87	62	99

Table 23: Nth of a kind levelized costs of abated electricity generation (2020$ CAD/tCO_2 captured)

CCS Application	Reference	Low	High
Abated coal generation with CCS	58	31	70
Abated gas generation with CCS	69	49	78

Industrial heat and cogeneration

The Table below describes the costs and efficiencies of industrial heat and cogeneration technologies available in the oil and gas sector. These assumptions are important as they affect the emissions intensity of thermal oil extraction, particularly from in-situ oil sands extraction, which deploys significant cogeneration and industrial heat assets.

Table 24: Industrial heat abatement parameters

Technology	Capital cost (2020$ CAD/GJ/year)	Fopex (2020$/CAD/GJ/year)	Emissions Intensity (Kg CO_2e/GJ Heat/year)
New Natural Gas	10.57	0.39	55
Efficient Natural Gas	14.78	0.47	53
Baseline Natural Gas with CCS	92	0.25	7*
Green Hydrogen	14.39	0.39	0*

**Excluding emissions from electricity use, as these vary in each model year*

Table 25: Cogeneration costs (2020$ CAD)

Technology	Capital cost (2020$ CAD/GJ of useful heat/year)	Fopex (2020$ CAD/GJ of useful heat/year)	Emissions Intensity (Kg CO_2e/GJ Heat/year)
Baseline Natural Gas	54.27	1.42	134
Baseline Natural Gas with CCS	238.22	1.42	15*
SMnR	379.35	5.16	0*

Excluding emissions from electricity use, as these vary in each model year

Oil sands extraction technology

As with industrial heat and cogeneration technologies, the cost of oil sands extraction is important to consider in this analysis, due to the implications for compliance outcomes under the oil and gas Emissions Cap.

Table 26: Oil sands extraction technology costs

Technology	Capital cost (2020 CAD/bbl/yr)	Fopex (2020 CAD/bbl/yr)	Heat demand (GJ Heat /bbl bitumen)
Existing (SAGD)	24.73	2.43	1.02
Full Solvent Based Extraction	29.68	3.16	0.61
Partial Solvent Based Extraction	27.20	2.67	0.77

Electricity generation

Table 27: First of a kind costs of electricity generation (Capital cost, 2020$ CAD/kW capacity)

Electricity Generation Technology	Reference	SK Reference	SK High
Combined cycle gas turbine	1,350	1,350	1,350
Single cycle gas turbine	1,199	1,199	1,199
Solar	1,733	2,823	3,105
Onshore wind	1,901	1,953	2,233
Small modular reactor	10,376	10,376	10,376

Table 28: Nth of a kind costs of electricity generation (Capital cost, 2020$ CAD/kW capacity)

Electricity Generation Technology	Reference	SK Reference	SK High
Combined cycle gas turbine	1,350	3,811	4,954
Single cycle gas turbine	1,199	3,109	4,041
Solar	806	1,313	1,444
Onshore wind	994	1,021	1,168
Small modular reactor	10,376	10,763	21,526

Hydrogen production and applications

Table 29: First of a kind costs of hydrogen electricity storage (Capital cost, 2020$ CAD/kW capacity)

	Reference	Low	High
Hydrogen Storage Charging	2,174	1,957	2,391
Hydrogen Storage Discharging	1,404	1,099	1,430

Table 30: Nth of a kind costs of hydrogen electricity storage (Capital cost 2020$ CAD/kW capacity)

	Reference	Low	High
Hydrogen Storage Charging	632	569	695
Hydrogen Storage Discharging	512	50	1,154

Table 31: First of a kind costs of hydrogen production

	Reference	Low	High	Unit
Green Hydrogen Production	2,174	1,957	2,391	Capital cost, 2020$ CAD/kW
Hydrogen for Transport Production	2,571	2,315	2,828	
Hydrogen production from electrolysis	8.24	7.42	9.06	Levelized cost 2020$ CAD/(GJ/yr)
Hydrogen production from steam methane reformation	4.96	3.81	6.31	

Table 32: Nth of a kind costs of hydrogen production

	Reference	Low	High	Unit
Green Hydrogen Production	632	569	695	Capital cost, 2020$ CAD/kW
Hydrogen for Transport Production	748	673	822	
Hydrogen production from electrolysis	2.40	2.16	2.63	Levelized cost 2020$ CAD/(GJ/yr)
Hydrogen production from steam methane reformation	4.97	3.81	6.33	

Direct Air Capture

Figure 24 provides the levelized cost of DAC. This analysis uses the High Cost case. DAC techno-economic parameters are based on Fasihi (2019)[107], Larsen et al. (2019)[108], Keith et al. (2018)[109] and conversations with experts in the field. Costs are harmonized using a 15% discount rate, 30-year average lifespan, $27.13/GJ electricity price, and $2.64/GJ natural gas price[110].

107 Fasihi et al. (2019). Techno-economic assessment of CO2 direct air capture plants. Journal of Cleaner Production, 224, 957-980.

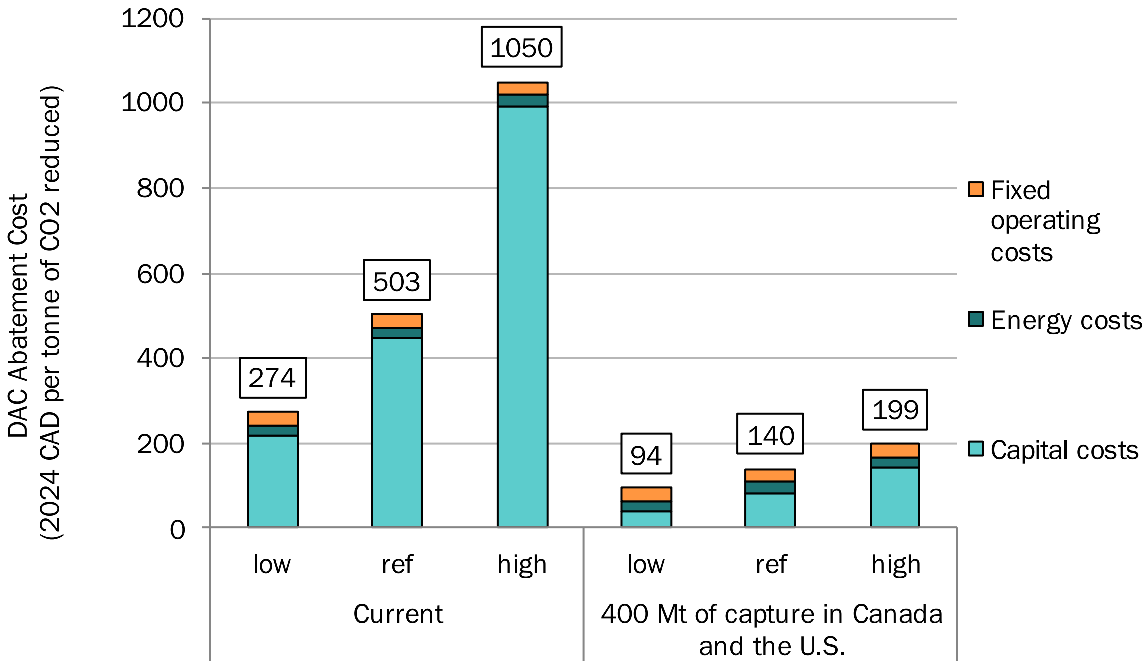
108 Larsen et al. (2019). Capturing Leadership, Policies for the US to Advance Direct Air Capture Technology. Rhodium Group.

109 Keith et al. (2018). A process for Capturing CO2 from the Atmosphere. Joule, 2, 1-22

110 2020 CAD

Energy prices are determined by the model and will change depending on the scenario. DAC costs decline as a function of uptake (Mt CO2 captured) due to economies of scale and learning.

Figure 24: DAC Costs ($2024 CAD)



Enhanced oil recovery

The cost for CO_2-EOR is an important metric as it affects a potential upside to CCS deployment in the oil and gas sector, as it provides a use for CO_2 and potential increases to overall production levels. We are proposing sensitivity analysis on the cost of CO_2-EOR as part of the technology cost sensitivity. The Reference, Low and High costs sensitivities in the Table below would make up the Reference Technology Cost, Low Technology Cost and High Technology Cost sensitivities.

Table 33: EOR technology levelized costs

Capex (2020 CAD/bbl)	42.2
CO_2 requirement (tCO_2/bbl)	0.3
CO_2 cost	Solved endogenously

Emissions intensities in oil and gas sectors

Table 34: Emissions intensity in key upstream oil sectors in Saskatchewan in 2020, Reference Case

	Stationary Combustion	Electricity	Methane Leaks	Surface Casing Vent Flows	Methane Venting	Flaring	Unit
Natural Gas	15.0		1.9	0.2	12.1	3.7	kt CO_2e/ Bcf
Light Oil	6.7		7.2	0.0	200.7	17.5	kg CO_2e/ barrel
Upgrading	19.9	26.8	1.3		2.5	9.3	
CHOPS	10.4		2.5		294.1	1.9	
SAGD	77.6		0.0		1.0	2.3	
Swift Current	5.9		3.8		177.0	2.7	

Crude oil and bitumen upgrading production break-even prices

Table 35: Conventional crude oil and bitumen upgrading productions break-even prices (2024$ USD/bbl)

	Break-even prices
Conventional light oil	42.9
Conventional heavy oil	50.5
Bitumen upgrading	52.8

SCHEDULE 4
TO THE REPORT OF THE ECONOMIC IMPACT
ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS
CAP

SEPTEMBER 03, 2024

NAVIUS RESEARCH INC. - METHANE 75 AND EMISSIONS
CAP ECONOMIC IMPACT ASSESSMENT TRIBUNAL SLIDES
DATED AUGUST 20, 2024

Methane 75 and Emissions Cap Economic Impact Assessment Tribunal

Quantitative analysis study report

August 20, 2024

About Navius

Navius Research

Navius Research is a Canadian consulting firm that uses energy-economy models to analyze the impacts of climate and energy policies.

Our analytical framework is used by clients across the country to inform greenhouse gas abatement pathways and economic impacts of policy.

We work for governments, industry, and non-profits across Canada and have been working directly with the Government of Saskatchewan for the past two years.

Project scope

This study report was requested by the EIAT to examine the economic impacts of the proposed Oil and Gas Sector Greenhouse Gas Emissions Cap (Emissions Cap) and Enhanced Oil and Gas Methane Regulations (Methane 75) in Saskatchewan between now and 2050.

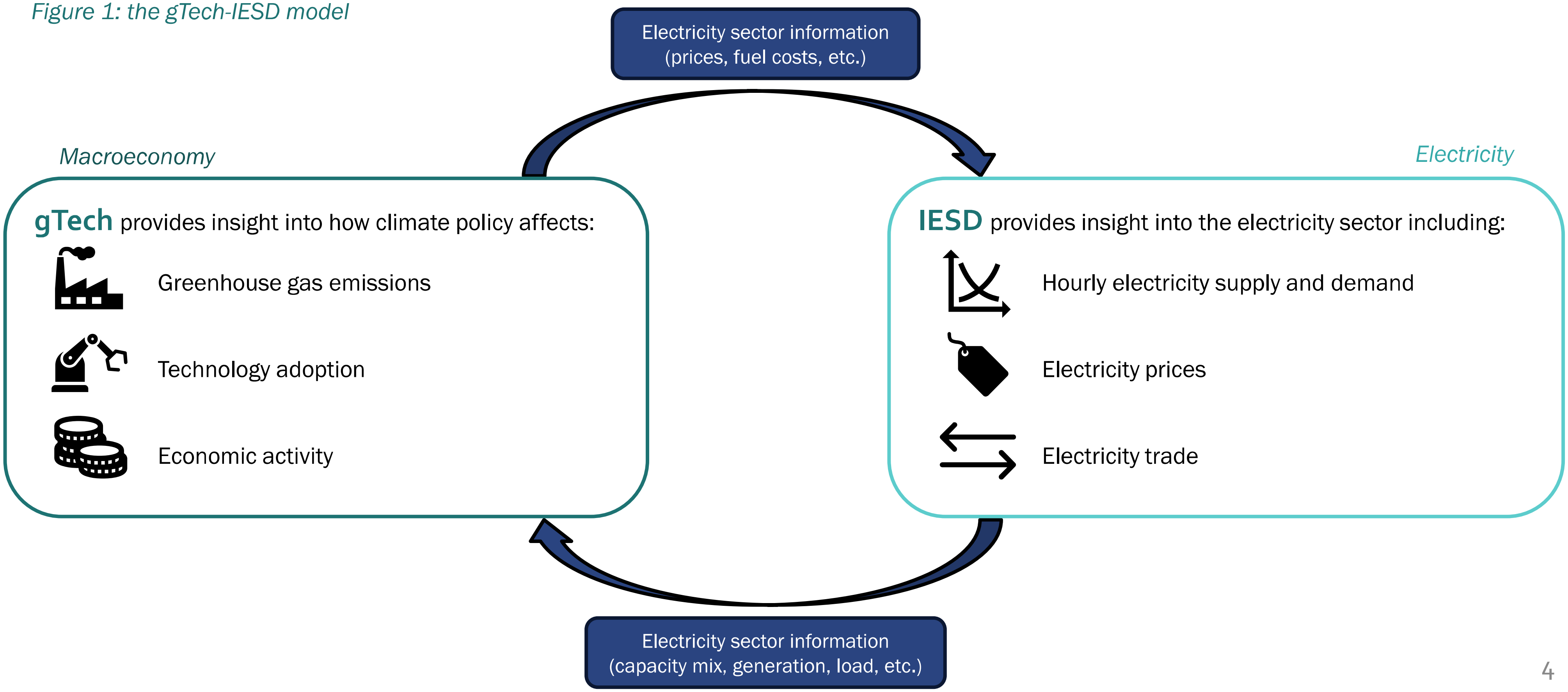
Our impact analysis covers three key areas:

1. Emissions abatement
2. Oil and gas economics
3. Provincial economy

Approach

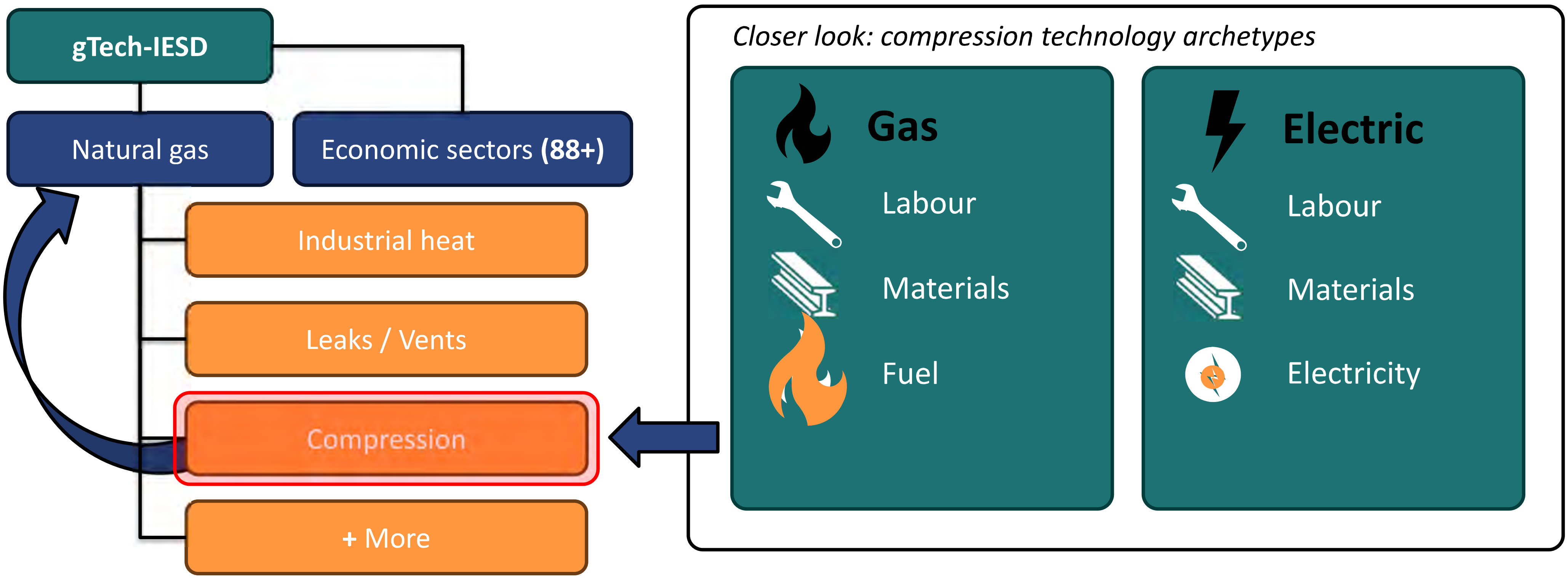
gTech-IESD links macroeconomic breadth with electricity sector granularity

Figure 1: the gTech-IESD model



gTech simulates decision making via a technology choice module

Figure 2: Technology competition in the gTech-IESD model



Saskatchewan model customizations

Navius has worked with the Ministry of Energy and Resources to customize gTech-IESD for this analysis, including:

- Saskatchewan's energy sector by delineating heavy oil production into three subsectors:
  - Cold Heavy Oil Production with Sand (CHOPS),
  - Steam Assisted Gravity Drainage (SAGD), and
  - Swift Current production.
- Methane abatement costs and requirements under:
  - Provincial Oil and Gas Emissions Management Regulations (OGEMR)
  - Venting and Flaring requirements: Directive PNG036; and
  - Federal Enhanced Oil and Gas Methane Regulations .

Policy scenarios

Overview | **Approach** | Impact analysis | Key insights

Table 1: Policy scenario design features

Policy area	Current Policy	Methane 75	Emissions Cap
Carbon pricing	The federal fuel charge and carbon pricing backstop rises at $15/t$CO_2$e per year to $170/t$CO_2$e by 2030, in real terms, with the OBPS in place		
Other legislated policies	Federal Investment Tax Credits, Clean Fuel Regulations, ZEV mandate, etc.		
Clean Electricity Regulations	Not implemented		
Oil and Gas Methane Policy	OGEMR and Directive PNG036 only	OGEMR and Directive PNG036 in 2025; Methane 75 in 2030 onwards	
Oil and Gas Emissions Cap	Not implemented		Implemented as per Navius' interpretation of the December 2023 Regulatory Framework

Methane 75 policy design

Table 2: Methane 75 policy design features

<table>
<tr><th>Category</th><th>Canada Gazette, Part I regulations</th><th>gTech-IESD representation</th></tr>
<tr><td>Emissions coverage</td><td colspan="2">Fugitive emissions, including methane leaks, venting and surface casing vent flows</td></tr>
<tr><td>Compliance requirements</td><td>Sets emissions management requirements for upstream oil and gas facilities.

Policy objective of achieving at least a 75% reduction in oil and gas sector methane emissions by 2030, relative to 2012</td><td>Prescriptive compliance actions:
▪ Quarterly Leak Detection and Repair
▪ Elimination of vents from devices, controllers and pumps
▪ Elimination of most vented emissions from wells, compressors and tanks with newly installed combustors and vapour recovery units, as well as tank and flare stack replacements</td></tr>
</table>

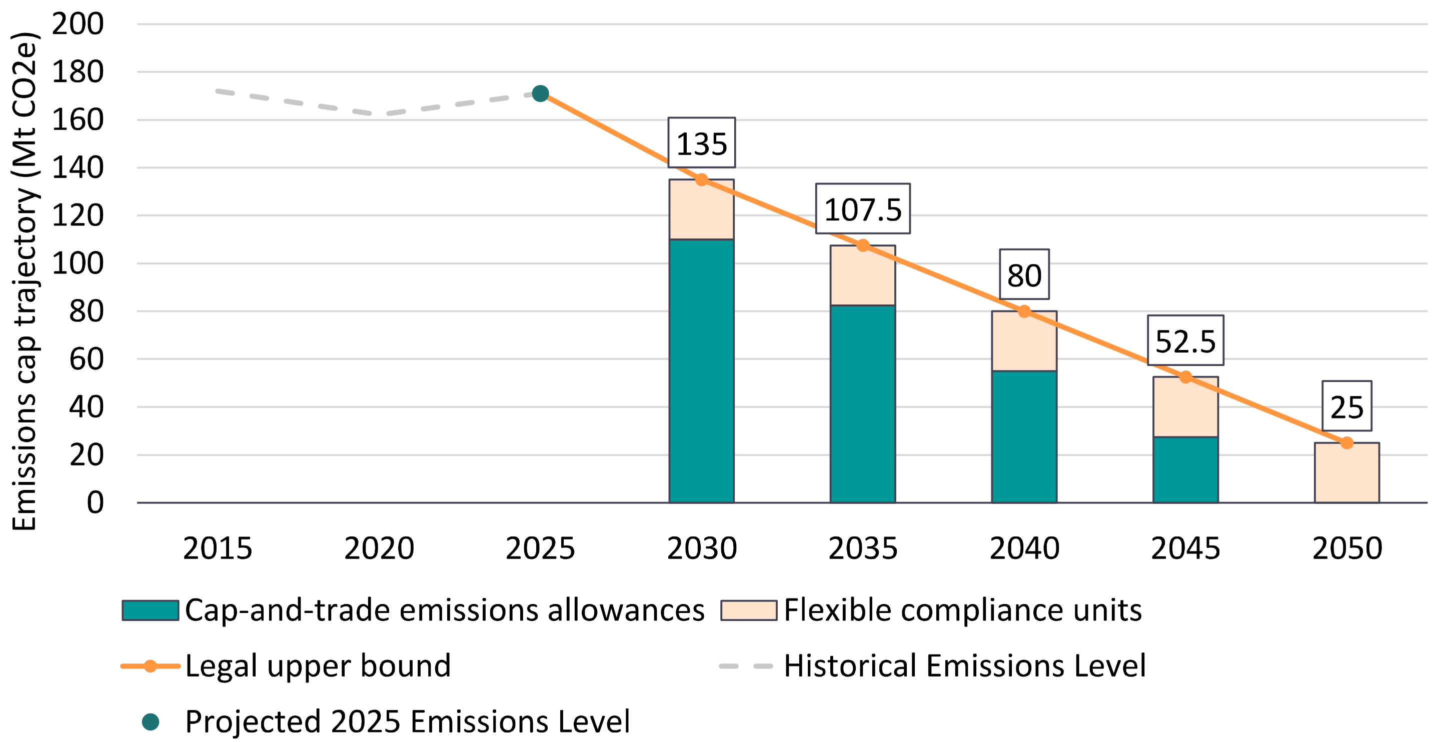
Emissions Cap policy design

Table 3: Emissions Cap policy design features

Category	December 2023 Regulatory Framework	gTech-IESD representation
Emissions coverage	All direct and indirect emissions from upstream oil and gas sectors	
Compliance requirements	▪ Emissions Cap set at 106-112 $MtCO_2e$ in 2030 ▪ Flexible compliance of 25 $MtCO_2e$ ▪ "Emissions decline at a pace and scale to meet net-zero by 2050" ▪ Facilities receive free allowances based on historical emissions intensity ▪ Allowances are tradable through cap-and-trade market.	▪ Simulation of cap-and-trade system ▪ Emissions Cap set at 110 MtC02e in 2030 ▪ Cap level declines linearly to achieve net-zero by 2050 ▪ Total offsets up to 25 $MtCO_2e$ available at $170/$tCO_2e$ every year ▪ Includes Methane 75

Emissions Cap policy design

Figure 3: Emissions Cap trajectory to 2050



Impact analysis

Impact analysis

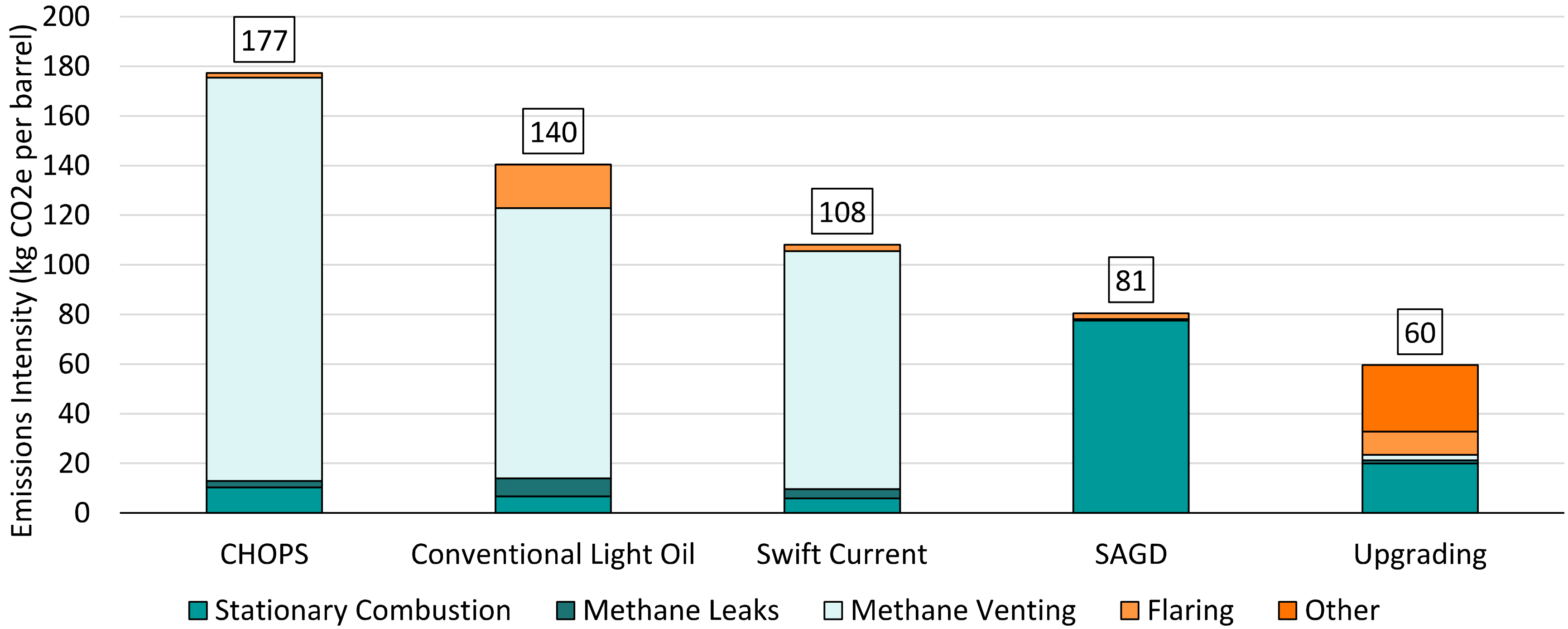
Overview | Approach | **Impact analysis** | Key insights

Our impact analysis covers three key areas:

1. Emissions abatement
2. Oil and gas economics
3. Provincial economy

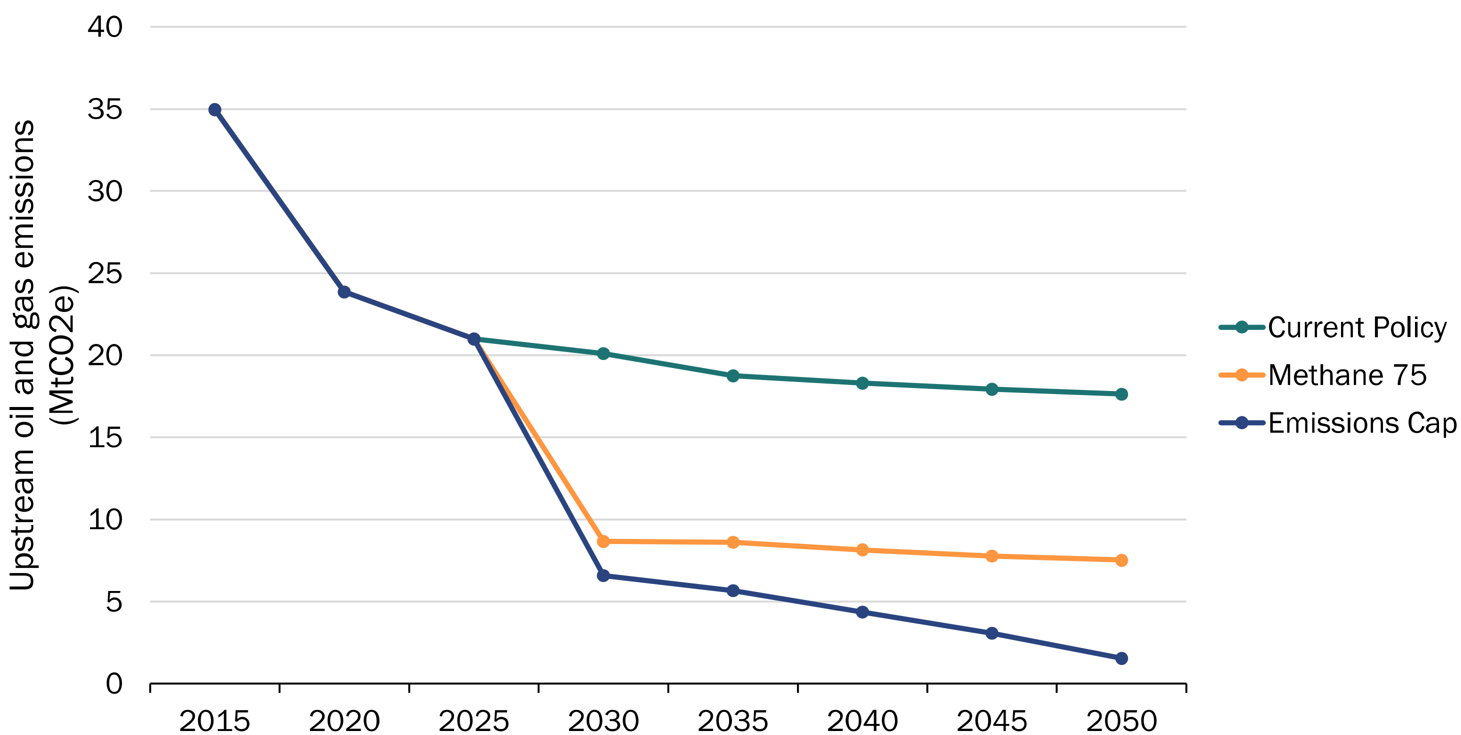
Methane is predominant emissions source in Saskatchewan's oil production

Figure 4: Emissions intensity in key upstream oil sectors in Saskatchewan in 2020



Methane 75 and the Emissions Cap lead to significant reductions in emissions

Figure 5: Annual direct upstream oil and gas emissions in Saskatchewan, Reference Case



Methane 75 increases the average cost of abatement in the oil and gas sector

- Abatement actions under Methane 75 will incrementally reduce vented and leaked emissions in Saskatchewan's oil and gas sector by 11.0 Mt CO2e, relative to Current Policy in 2030
- The incremental compliance cost of the policy is $356 million (2023$) per year
- The **average cost of abatement** is $30.6 per tonne CO_2e (2023$)
- This value does not include the cost of ceased production, i.e. production shut-in

Table 4: Cost of methane abatement under Current Policy and Methane 75, Reference Case

Sector	Current Policy[1]	Methane 75[2]	Policy impact
Total GHG abatement (Mt CO_2e/yr in 2030)	8.2	19.2	11.0
Total incremental levelized* compliance cost ($2022 million/yr in 2030)	230	586	356
Average abatement cost ($2022 per tonne CO_2e)	28.0	30.6	2.5

[1] Includes the set of requirements for OGEMR and Directive PNG036, often referred to as Methane 45.
[2] Excludes any abatement from shut-in production, so that the abatement cost only represents the cost of compliance actions.

* levelized costs are the sum of annualized capital costs (17.5% discount rate) plus the net difference in operating and energy costs.

Emissions Cap incurs costs to sectors that need to take additional compliance actions

- The price for allowances under the Emissions Cap, which is also the **marginal cost of abatement**, increases as the Emissions Cap becomes more stringent
- The cost of offsets sets the price of allowances in 2030 under the Reference Case
- After 2030, the price of allowances is set based on the next most expensive abatement action required to achieve compliance with the Emissions Cap, as all offsets are exhausted
- The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap.

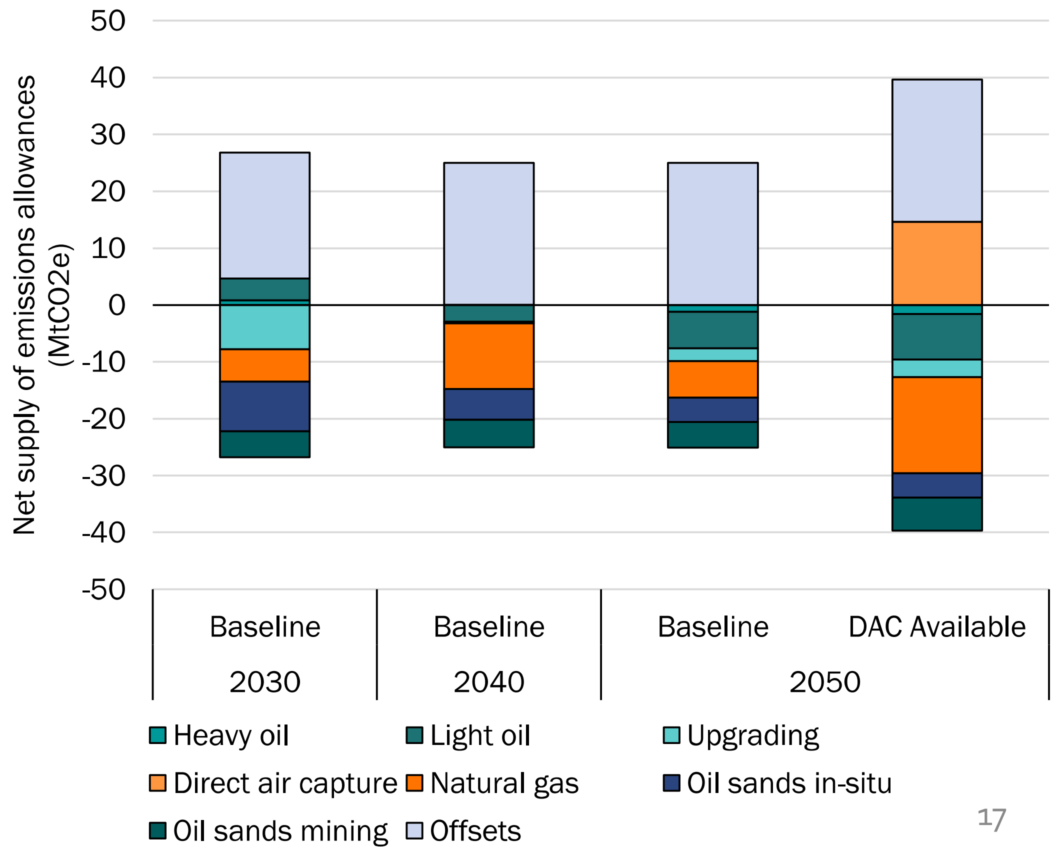
Table 5: Price of emissions allowances under the Emissions Cap by sensitivity (2030$ per tonne of CO2e)

Sensitivity	2030	2035	2040	2045	2050
Reference Case	**170**	**182**	**204**	**422**	**796**
No CCS available	559	545	550	580	809
DAC available	170	182	204	414	488

Emissions Cap incurs costs to sectors that need to take additional compliance actions

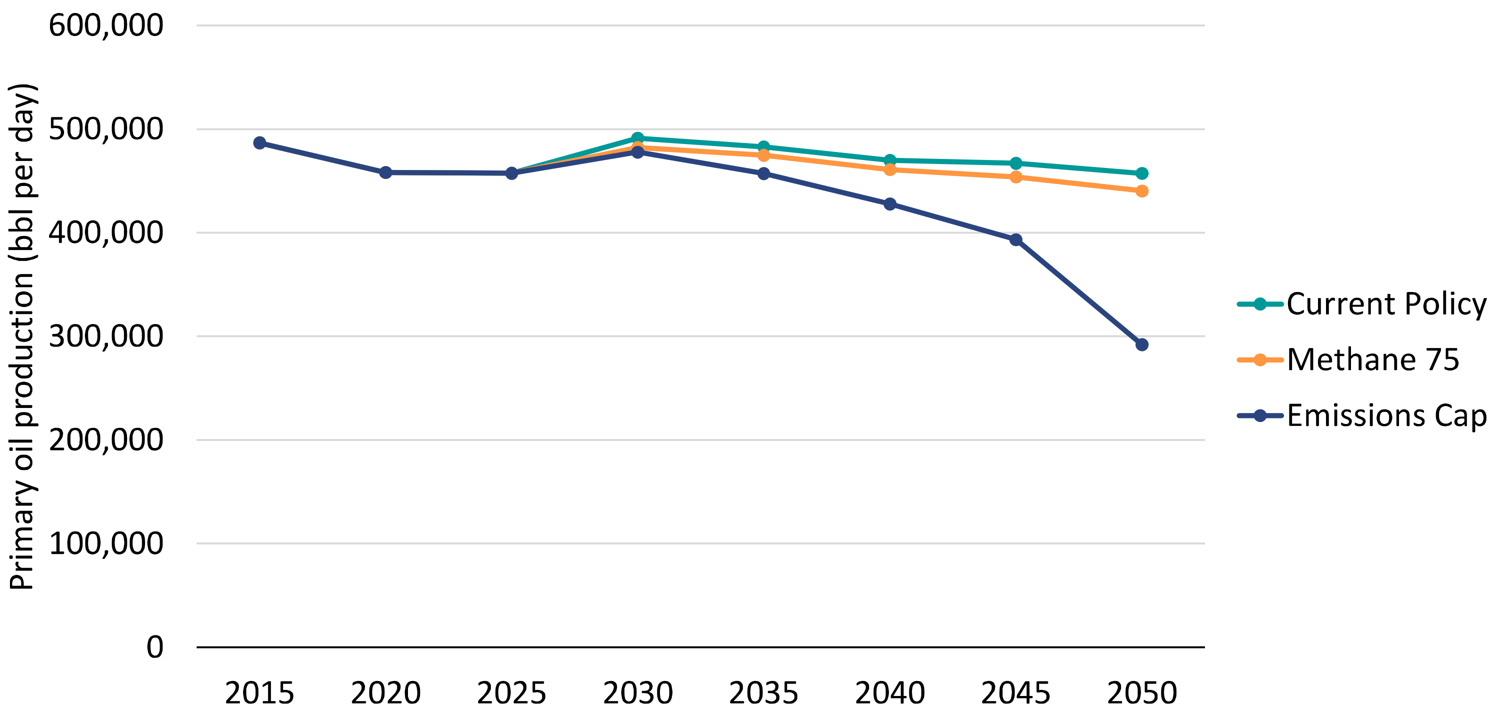
- Most sectors must purchase additional allowances to comply with the Emissions Cap
- CHOPS, Swift Current and Conventional light in Saskatchewan have excess allowances in 2030 because of abatement under Methane 75 and the relative cost of abatement compared to other sectors.
- SAGD and upgrading must purchase additional emissions allowances in all model years.
- After 2030, all sectors are required to purchase additional allowances and all offsets are exhausted.
- The inclusion of Direct Air Capture provides a facility for additional allowances, as it is a negative-emissions technology
- Allowances are traded at the allowance prices presented in the previous slide

Figure 6: National Emissions Cap allowance market by sensitivity (MtCO2e)



Methane 75 and the Emissions Cap will negatively affect oil production in Saskatchewan

Figure 7: Total primary oil production in Saskatchewan, Reference Case



Methane 75 and the Emissions Cap will negatively affect oil production in Saskatchewan

Methane 75

- Primary oil production under Methane 75 is 2-3% below Current Policy
- Production losses culminate in the 'methane-intensive' sectors, i.e. Light Oil, CHOPS and Swift Current

Emissions Cap

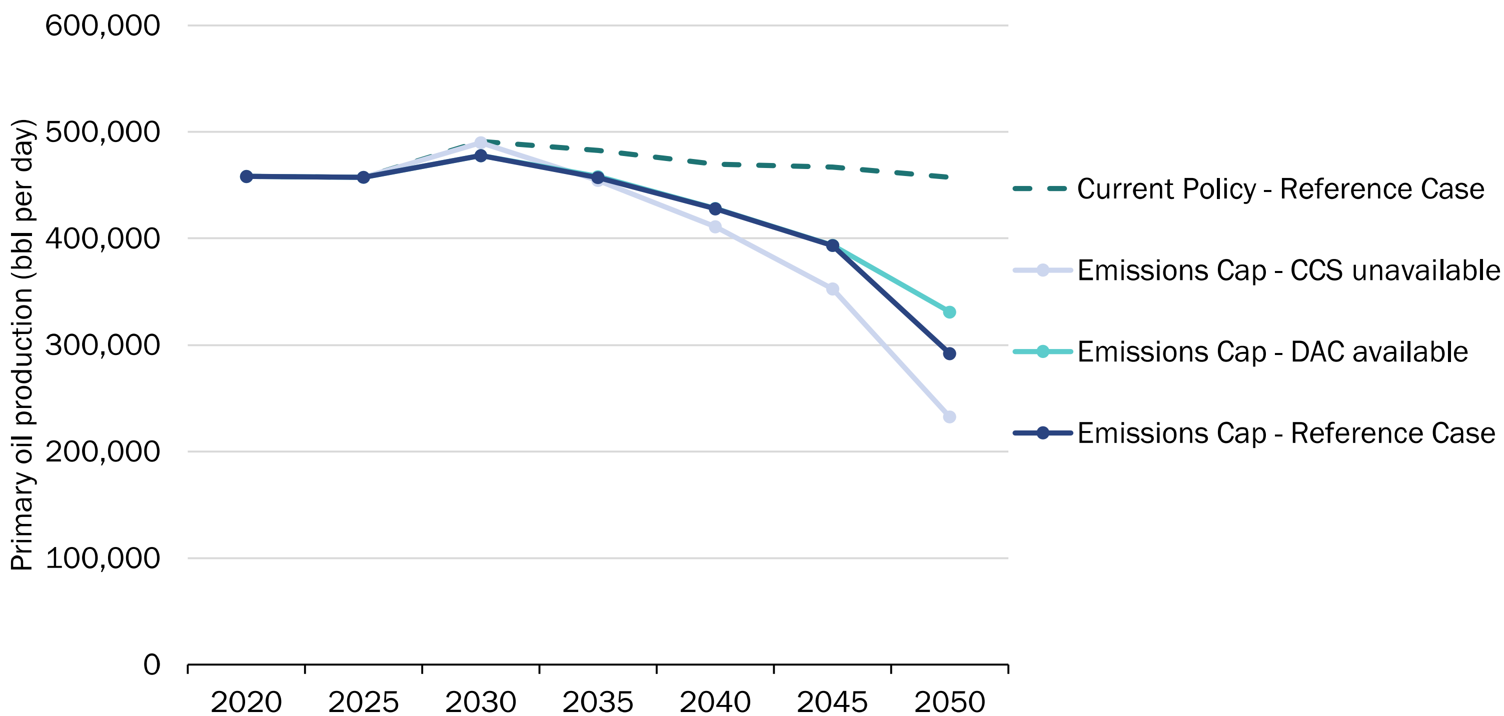
- The Emissions Cap leads to lower overall production than Methane 75 in all model years; losses are primarily in SAGD and Light Oil
- Primary oil production is 3% below Current Policy in 2030; 9% below in 2040; and 38% below in 2050
- Revenue from allowance sales in 2030 partially offsets the losses in production in 'methane-intensive' sectors, but by 2050 all sectors are worse off under the Emissions Cap.

Table 6: Impact of Methane 75 and Emissions Cap on primary oil production in Saskatchewan, Reference Case

Production category	2025	2030	2035	2040	2045	2050
Total primary oil production under Current Policy	457	491	483	470	467	457
Change in oil production under Methane 75	0	-9	-8	-9	-13	-17
Change in oil production under Emissions Cap	0	-14	-26	-42	-74	-165

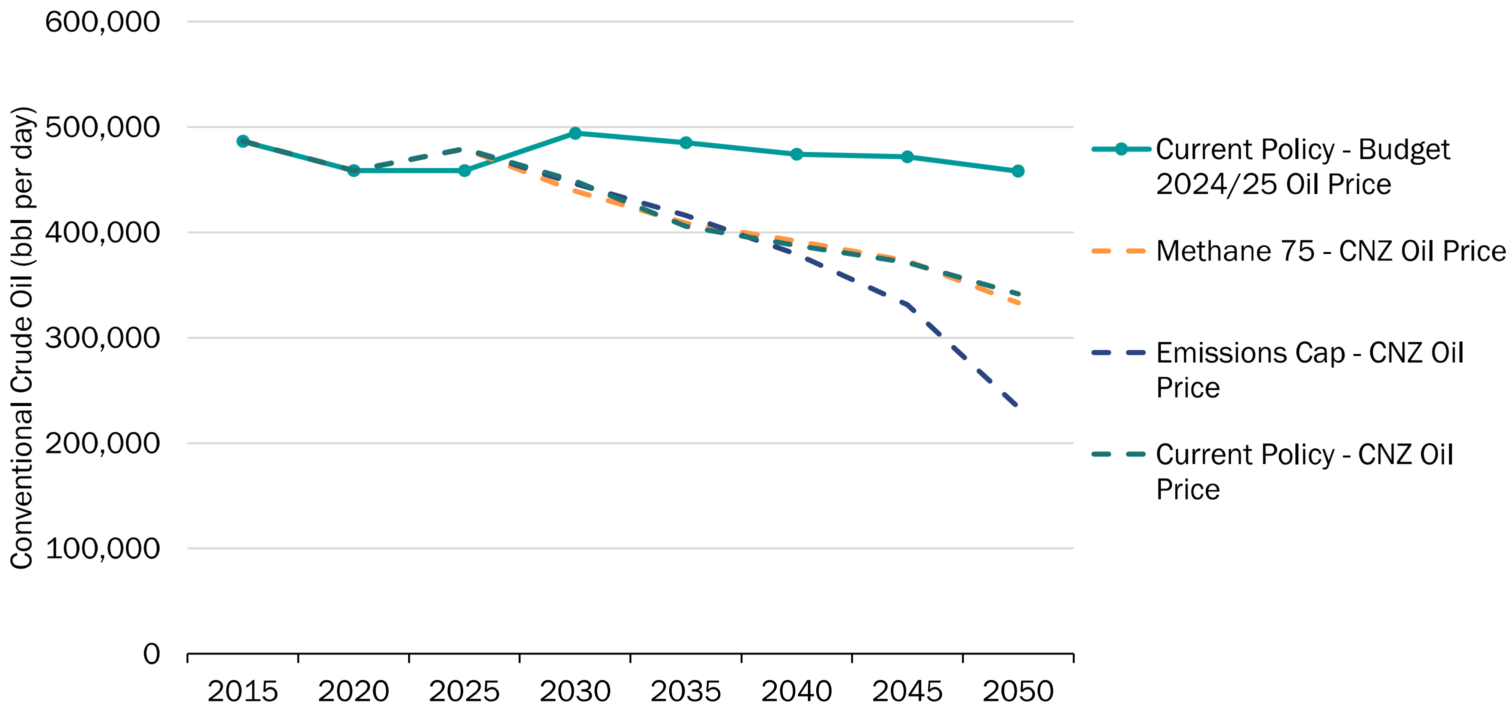
The availability of CCS and DAC also affects production outcomes

Figure 8: Total primary oil production in Saskatchewan, various sensitivities



Global oil prices can be more impactful to production outcomes than domestic policy

Figure 9: Total primary oil production in Saskatchewan, various sensitivities



Lower production activity leads to less investment and sector employment after 2030

Overview | Approach | **Impact analysis** | Key insights

Methane 75

- In 2030, annual investment in the sector is equivalent to Current Policy – lost production capital is offset by investment for compliance – with ~100 fewer full-time equivalent jobs (FTEs)
- By 2040 and 2050, annual oil and gas investment is $0.2-0.3 billion ($2023) below Current Policy
- After 2030, there are 400-500 FTEs in the sector

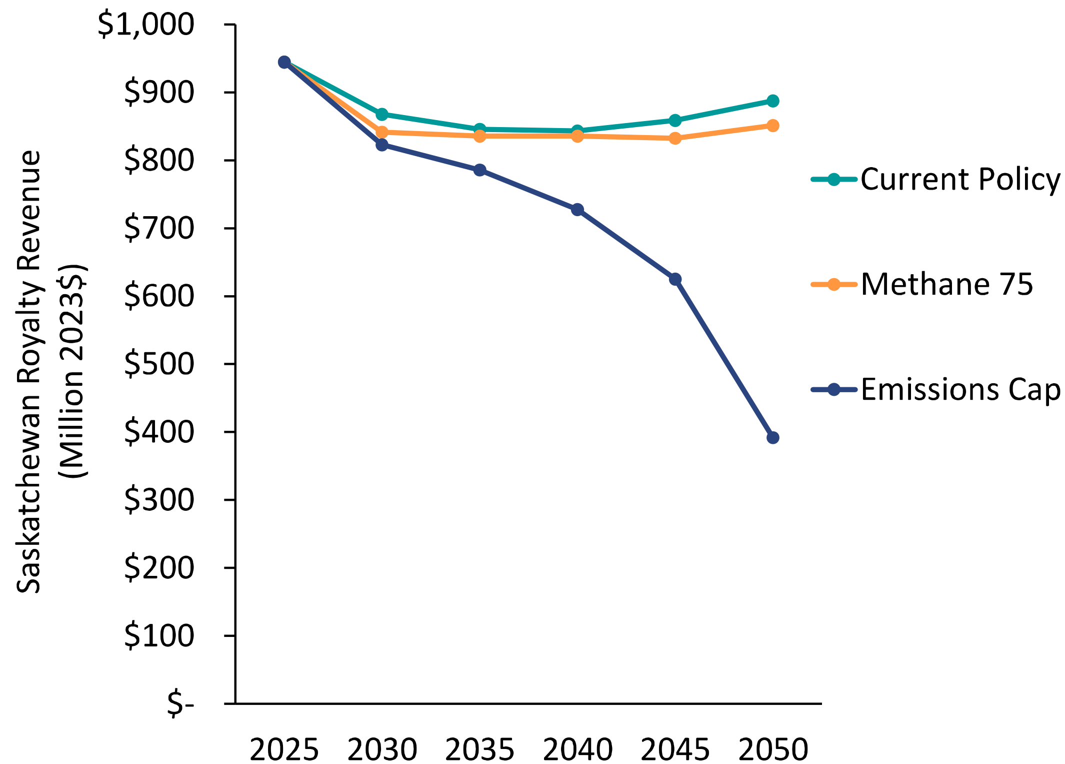
Emissions Cap

- In 2030, the sector requires $0.4 billion more investment to achieve compliance with the emissions cap, driven primarily by CCS deployment in SAGD and upgrading
- By 2040, annual investment is $0.7 billion below Current Policy with 600 fewer FTEs
- By 2050, annual investment is $3.6 billion below Current Policy with 3,000 fewer FTEs

Government revenue in Saskatchewan is reduced under Methane 75 and the Emissions Cap

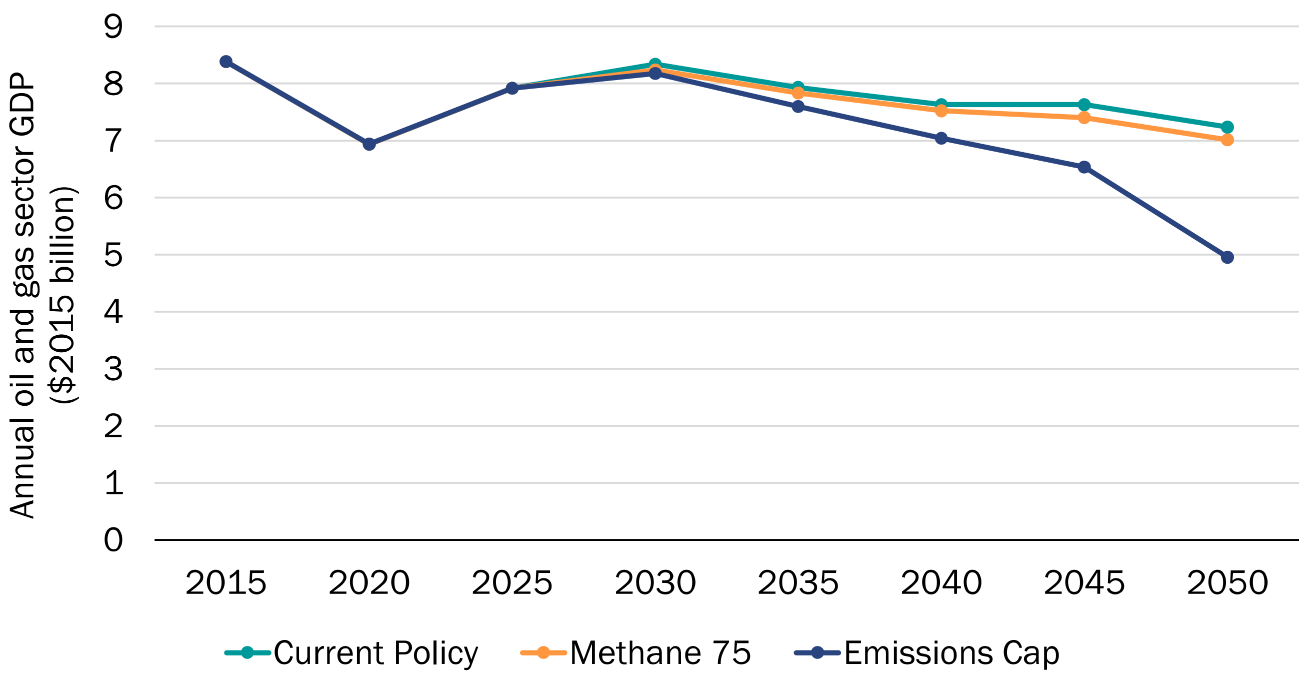
- Lower oil production under Methane 75 and the Emissions Cap leads to reduced government revenue in Saskatchewan
- Losses in revenue are driven primarily by lower royalty and production tax revenue
- Total annual government revenue collected in Saskatchewan (federal and provincial) is $0.1 billion below Current Policy in 2030
- Under the Emissions Cap, the revenue gap increases to $0.5 billion in 2040 and $2.1 billion in 2050

Figure 10: Oil and gas royalty and production tax revenue, Reference Case



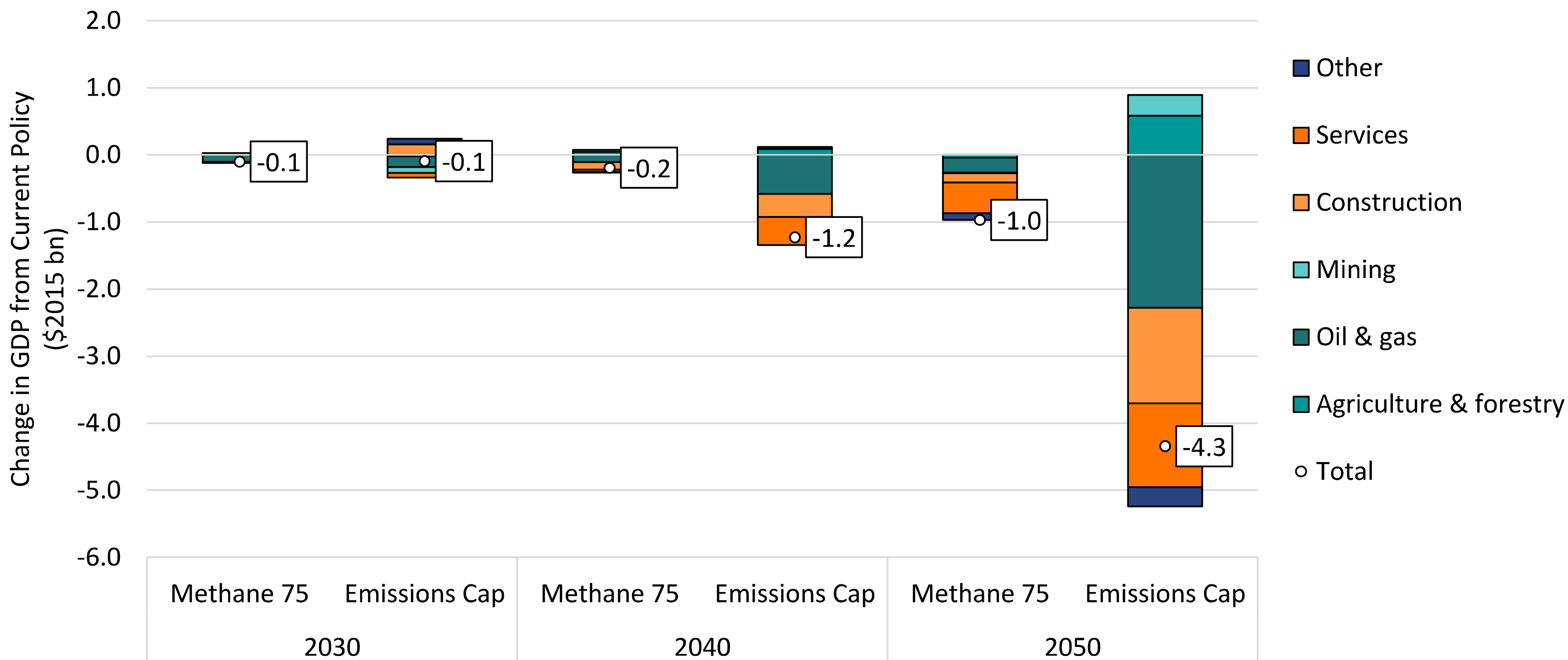
Saskatchewan's GDP growth slows under Methane 75 and the Emissions Cap

Figure 11: Annual oil and gas sector GDP, Reference Case (C$2015 billion)



Saskatchewan's GDP growth slows under Methane 75 and the Emissions Cap

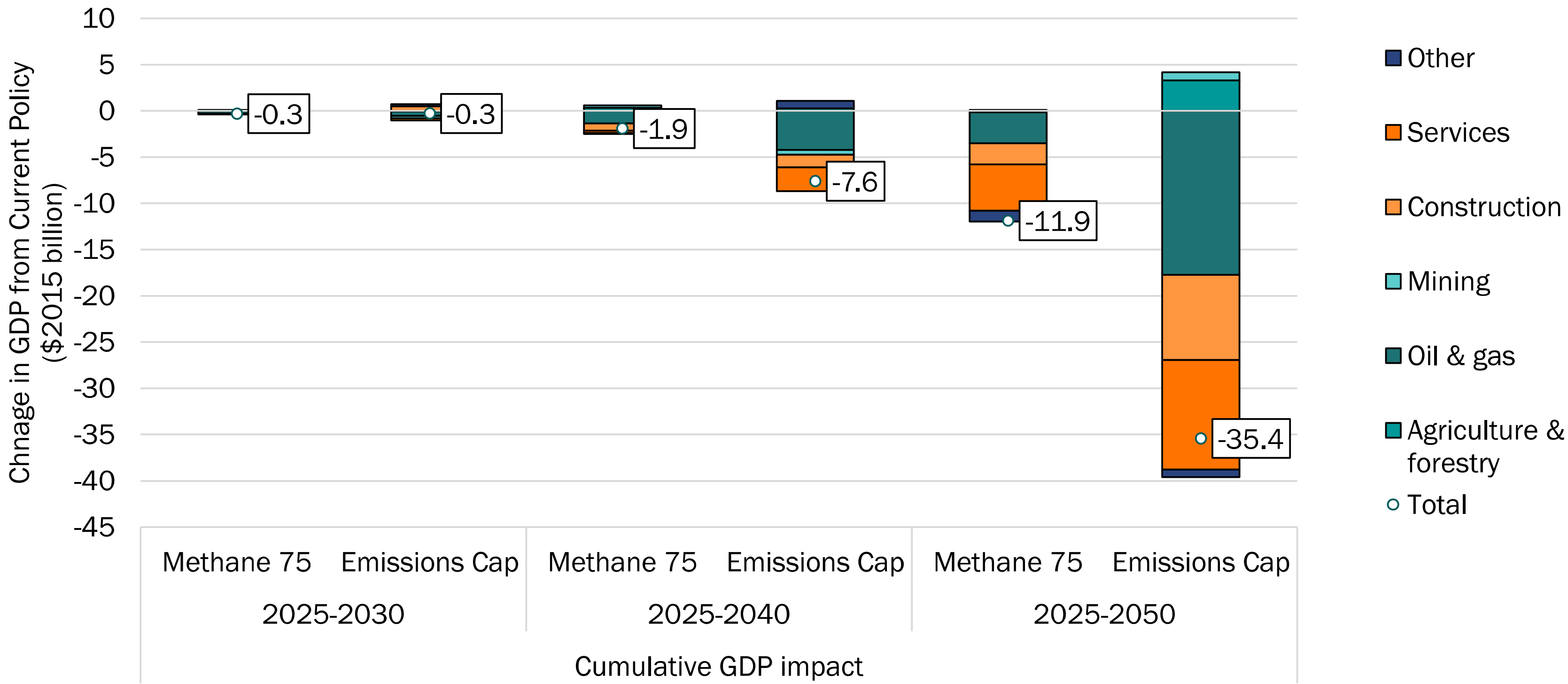
*Figure 12: Change in **annual** GDP from Current Policy by sector, Reference Case (C$2015 billion)*



Saskatchewan's GDP growth slows under Methane 75 and the Emissions Cap

Overview | Approach | **Impact analysis** | Key insights

*Figure 13: Change in **cumulative** GDP from Current Policy by sector, Reference Case (C$2015 billion)*



Key insights

Key insights

Overview | Approach | Impact analysis | **Key insights**

Insight 1: Methane 75 and the Emissions Cap create material reductions in oil and gas sector emissions, but the sector will incur additional compliance costs that may affect sector activity.

Insight 2: Achieving compliance with Methane 75 and the Emissions Cap will impact Saskatchewan's oil and gas production, investment and employment.

Insight 3: Reduced oil and gas production under Methane 75 and the Emissions Cap leads to lower government revenue and slower economic growth in Saskatchewan

Insight 4: Oil prices are an important factor in driving production outcomes.

Insight 5: The availability of emerging technologies, such as CCS and DAC, is important for maintaining lower compliance costs for facilities under the Emissions Cap.

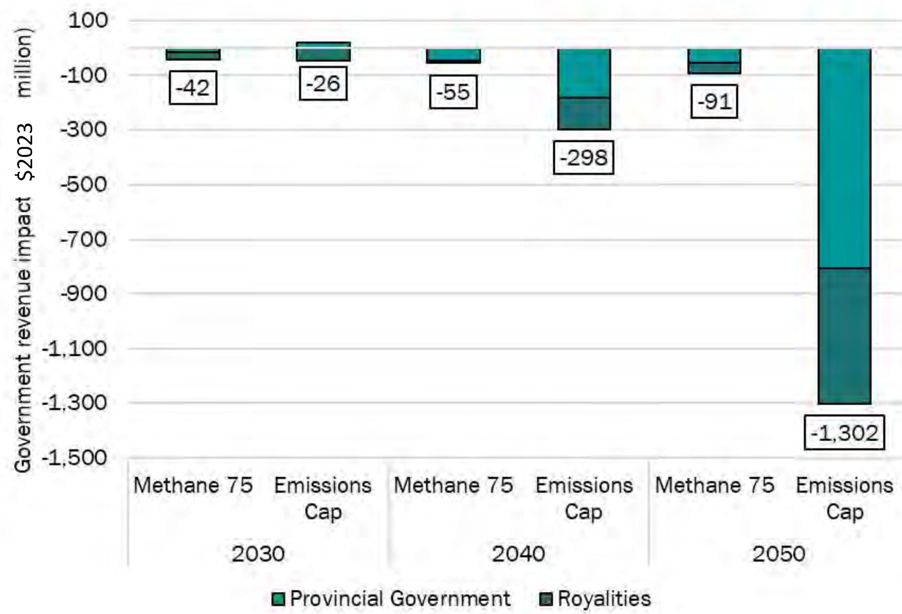
Analysis caveats

- Representation of Saskatchewan's oil and gas sector. Saskatchewan's oil and gas industry is highly heterogenous, with variation in both the types of production and size of facility.
- Representation of oil and gas policy compliance costs for Methane 75. The characterization of methane management practices in gTech-IESD requires an assumption about the proportion of facilities that will take compliance actions and the proportion that will cease production
- The Emissions Cap policy design is uncertain. The Emissions Cap has been proposed by the federal government but has not proceeded past the Regulatory Framework stage.
- Labour availability in Saskatchewan. Labour availability and productivity in this analysis are assumed to grow in line with the Parliamentary Budgetary Officer (PBO) 2023 Fiscal Sustainability Report
- Assumed breakeven price for oil. This assumption affects the sensitivity of oil production to changes in costs. Breakeven prices for this analysis were inferred based on the CER's 2023 Canada's Energy Future report
- Global price of oil as an exogenous assumption. This analysis sets the global price of oil as an external assumption

Supplementary slides

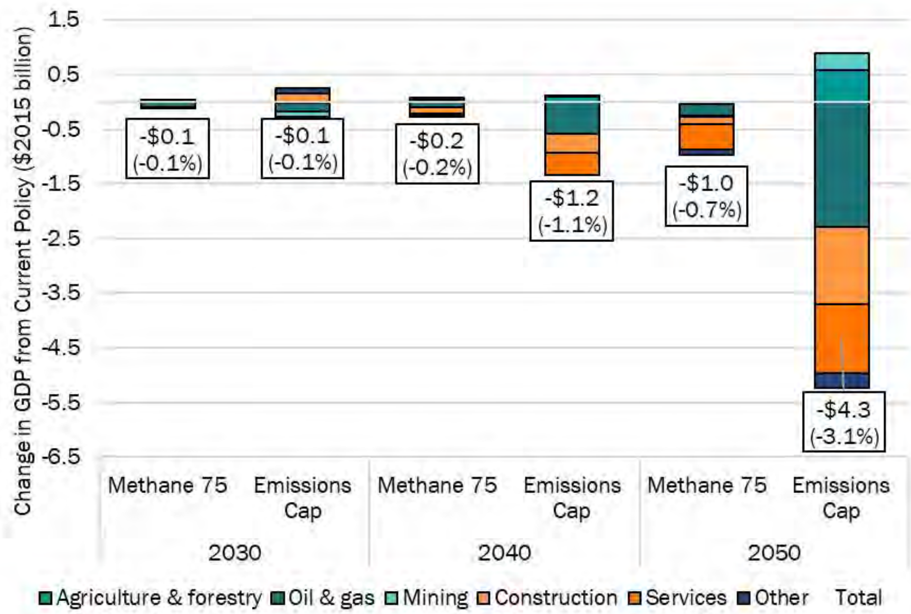
Impacts on Government Revenues

Figure 14: Change in annual provincial government revenue from Current Policy by sector, Reference Case (C$2023 million)



Impacts on Annual GDP

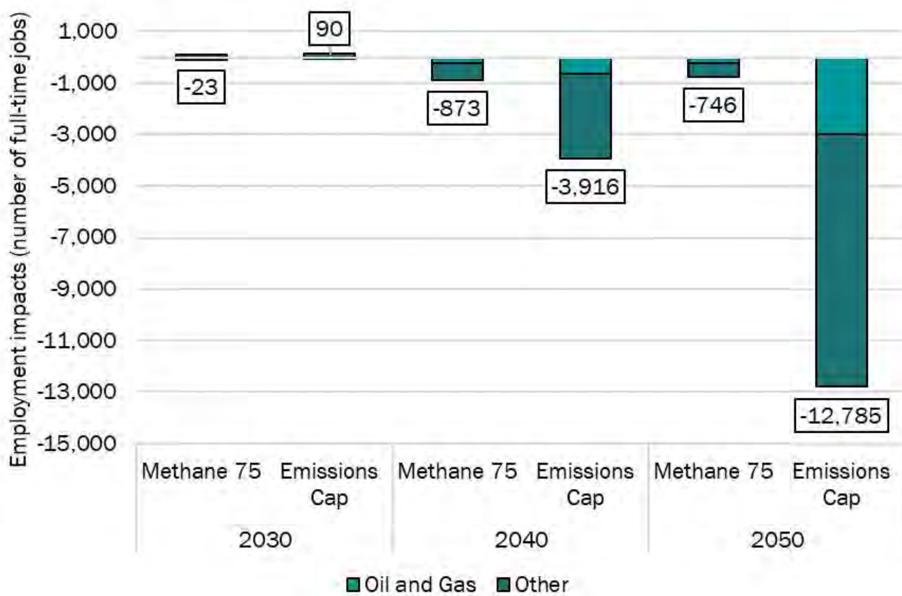
Figure 15: Change in annual GDP from Current Policy by sector, Reference Case (C$2015 billion)



Impacts on Employment

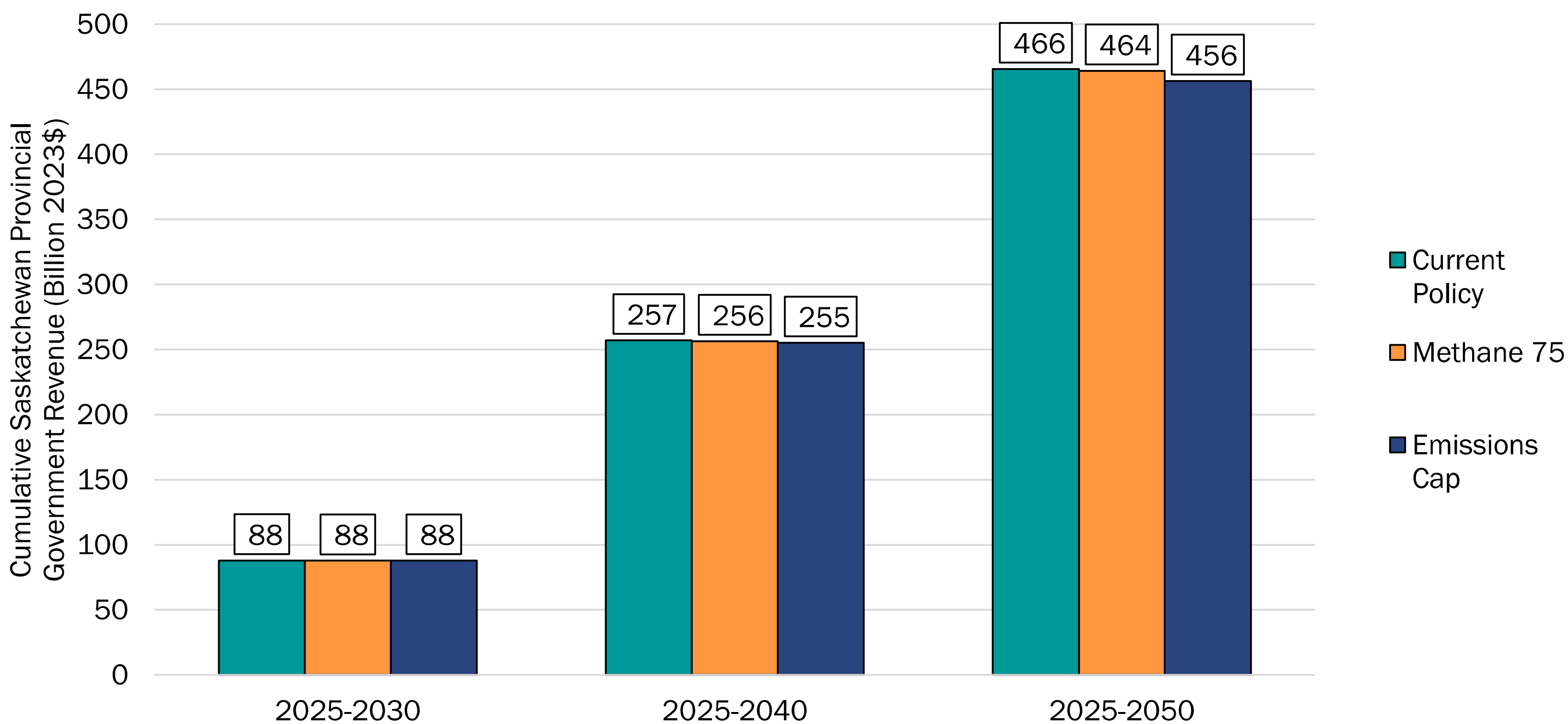
Overview | Approach | Impact analysis | Key insights | **Supplementary slides**

Figure 16: Change in provincial employment in Saskatchewan from Current Policy, Reference Case (Full Time Equivalent Jobs)



Impacts on Government Revenues

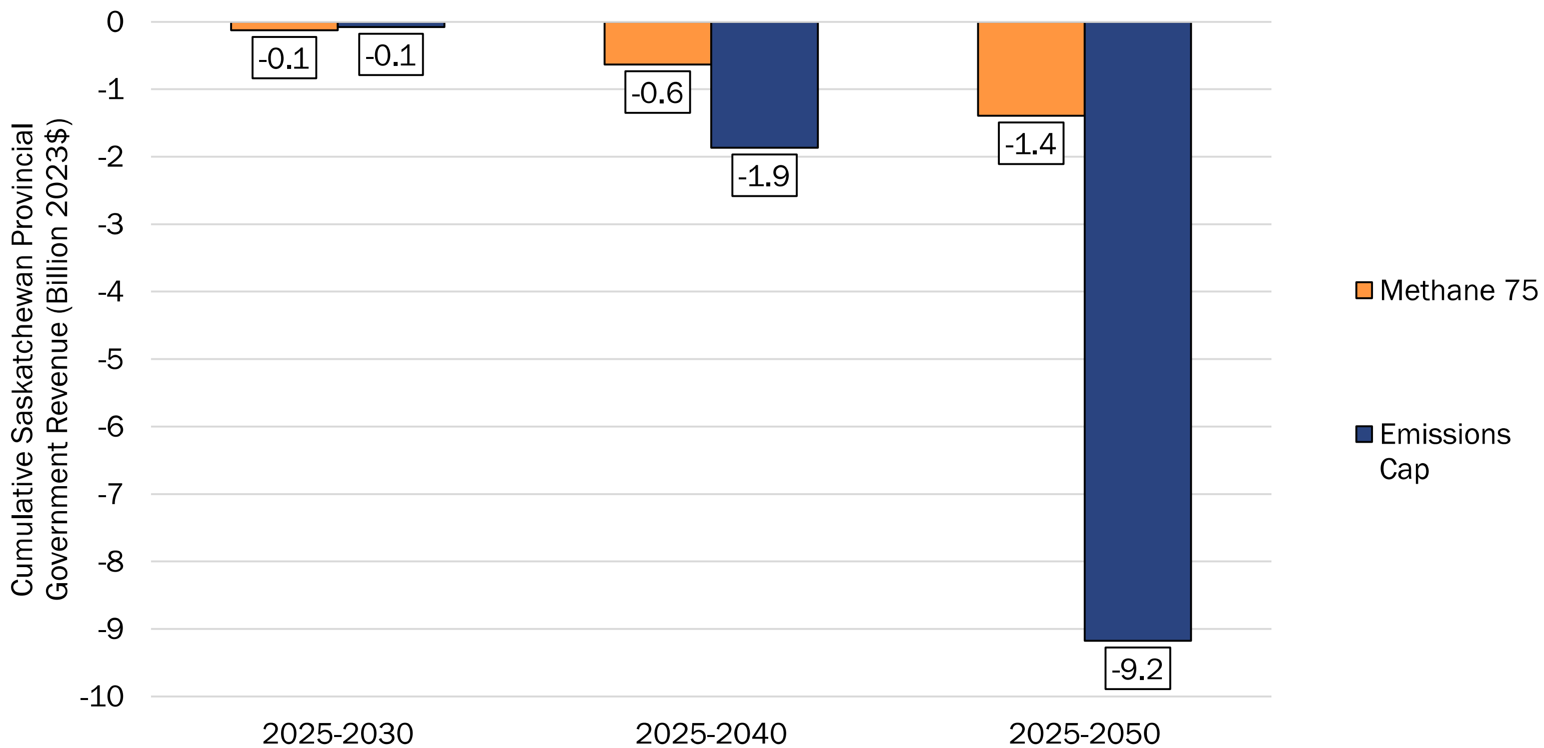
Figure 17: Cumulative provincial government revenue, Reference Case (C$2023 billion)



Impacts on Government Revenues

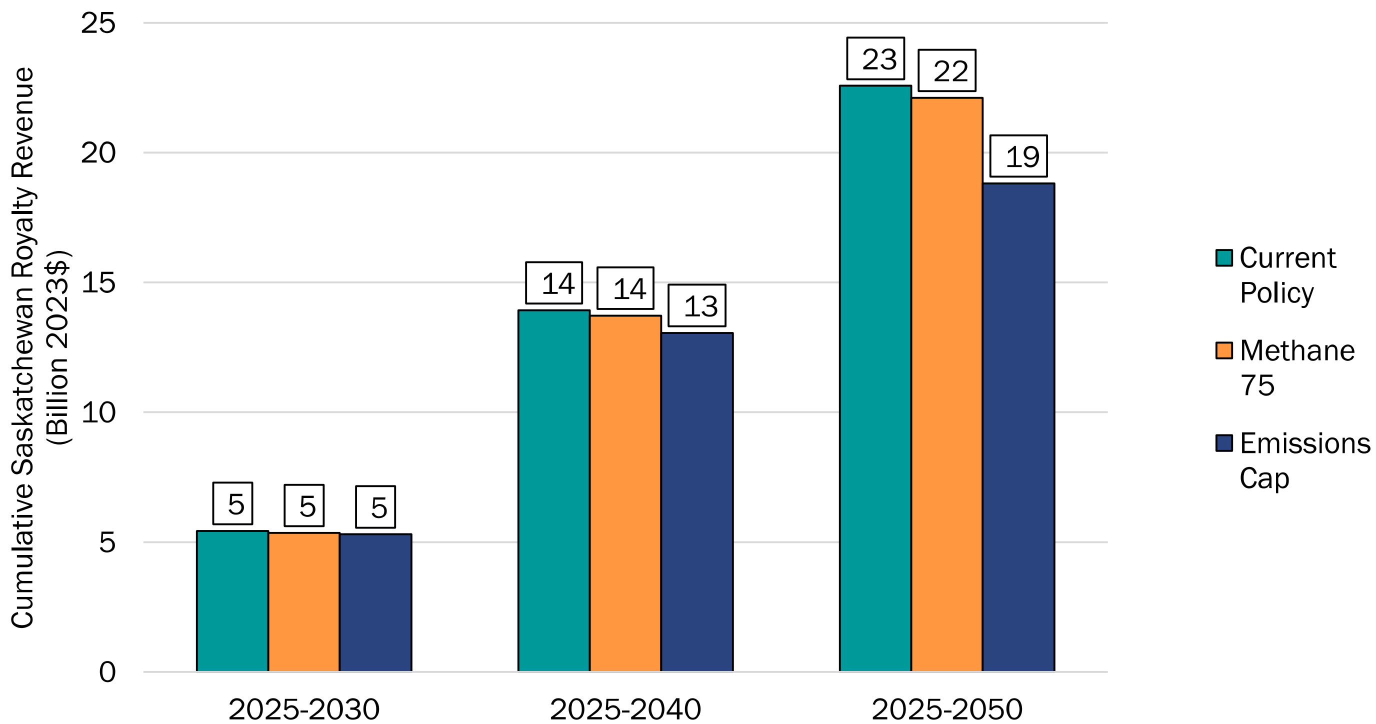
Overview | Approach | Impact analysis | Key insights | **Supplementary slides**

Figure 18: Change in cumulative provincial government revenue from Current Policy, Reference Case (C$2023 billion)



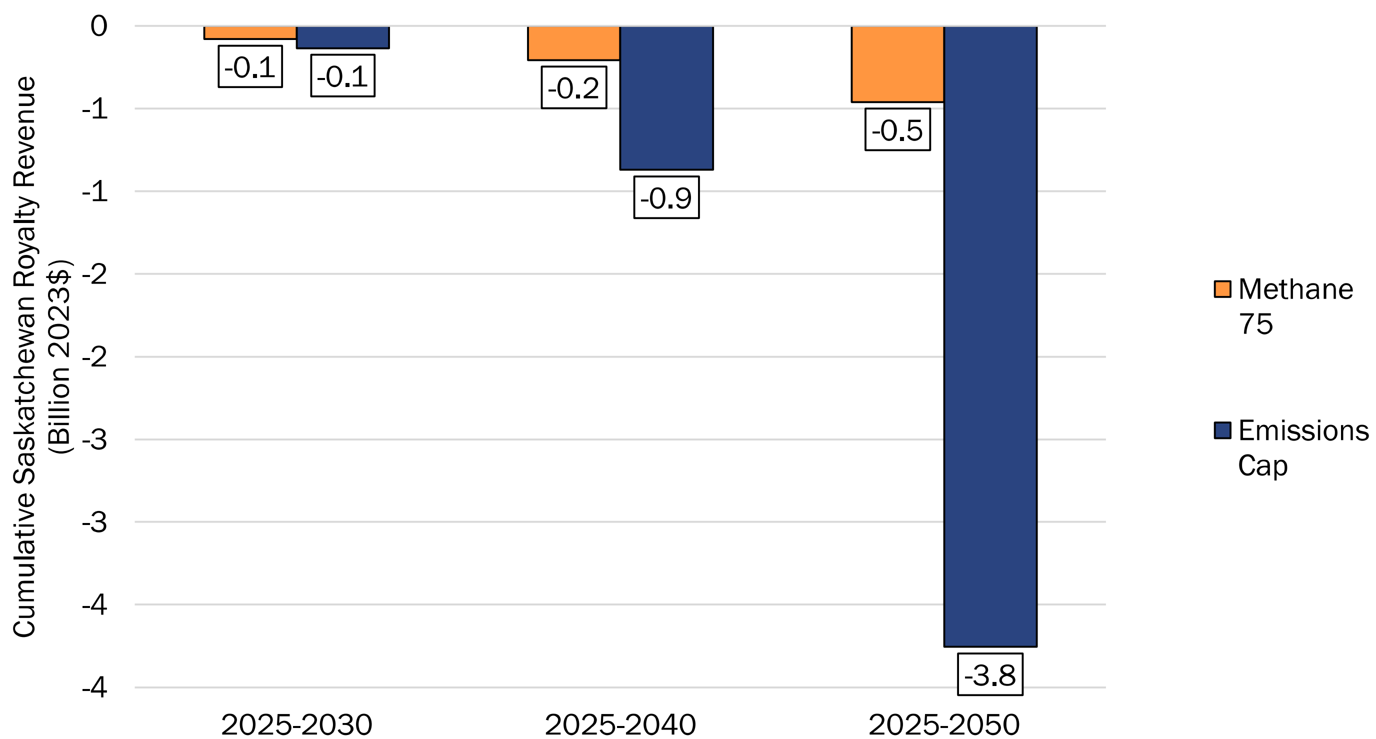
Impacts on Government Revenues

Figure 19: Cumulative oil and gas royalty and production tax revenue, Reference Case (C$2023 billion)



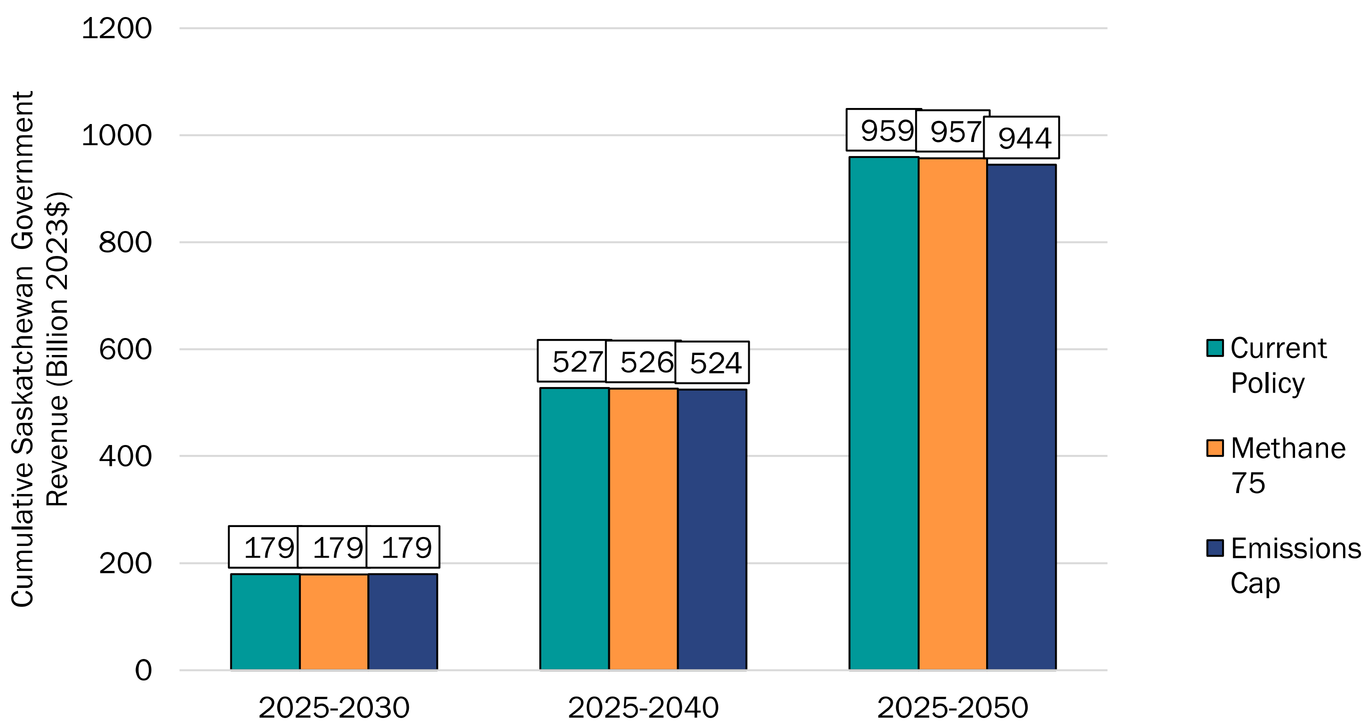
Impacts on Government Revenues

Figure 20: Change in cumulative oil and gas royalty and production tax revenue from Current Policy, Reference Case (C$2023 billion)



Impacts on Government Revenues

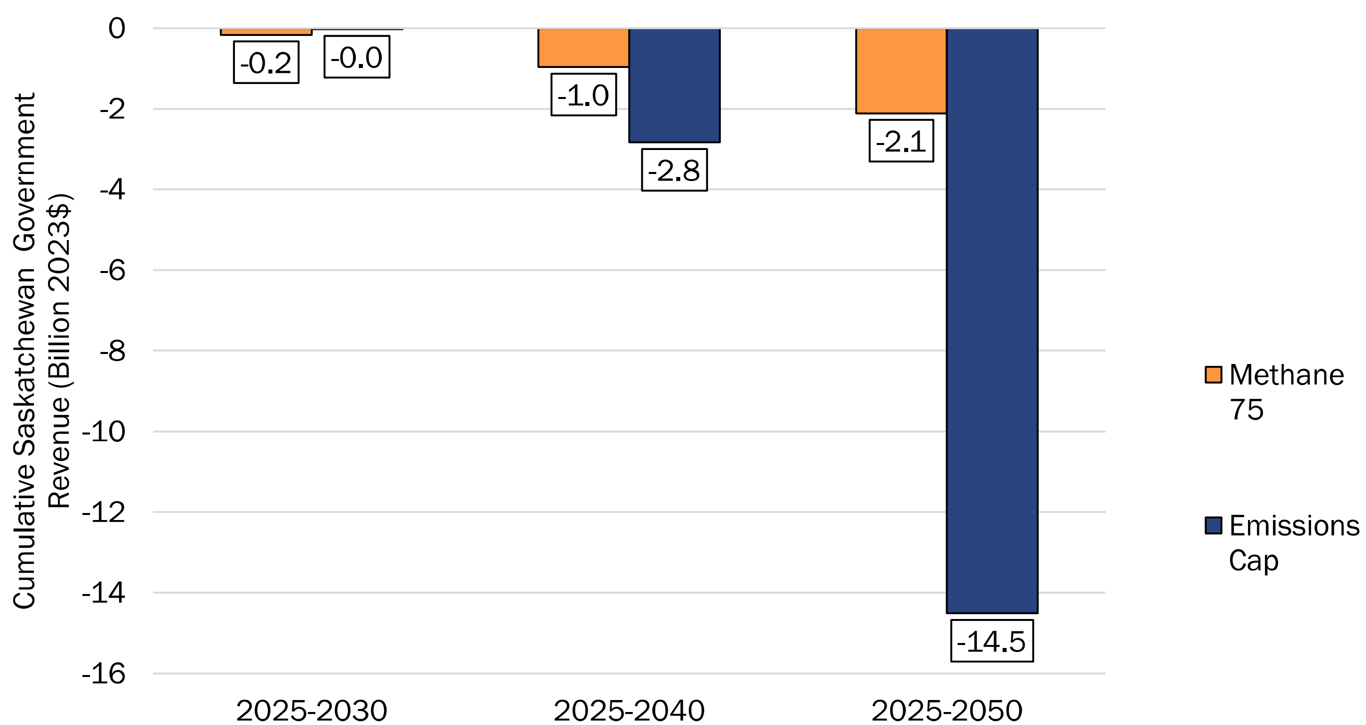
Figure 21: Cumulative Sask. provincial and federal government revenue, Reference Case (C$2023 billion)



Impacts on Government Revenues

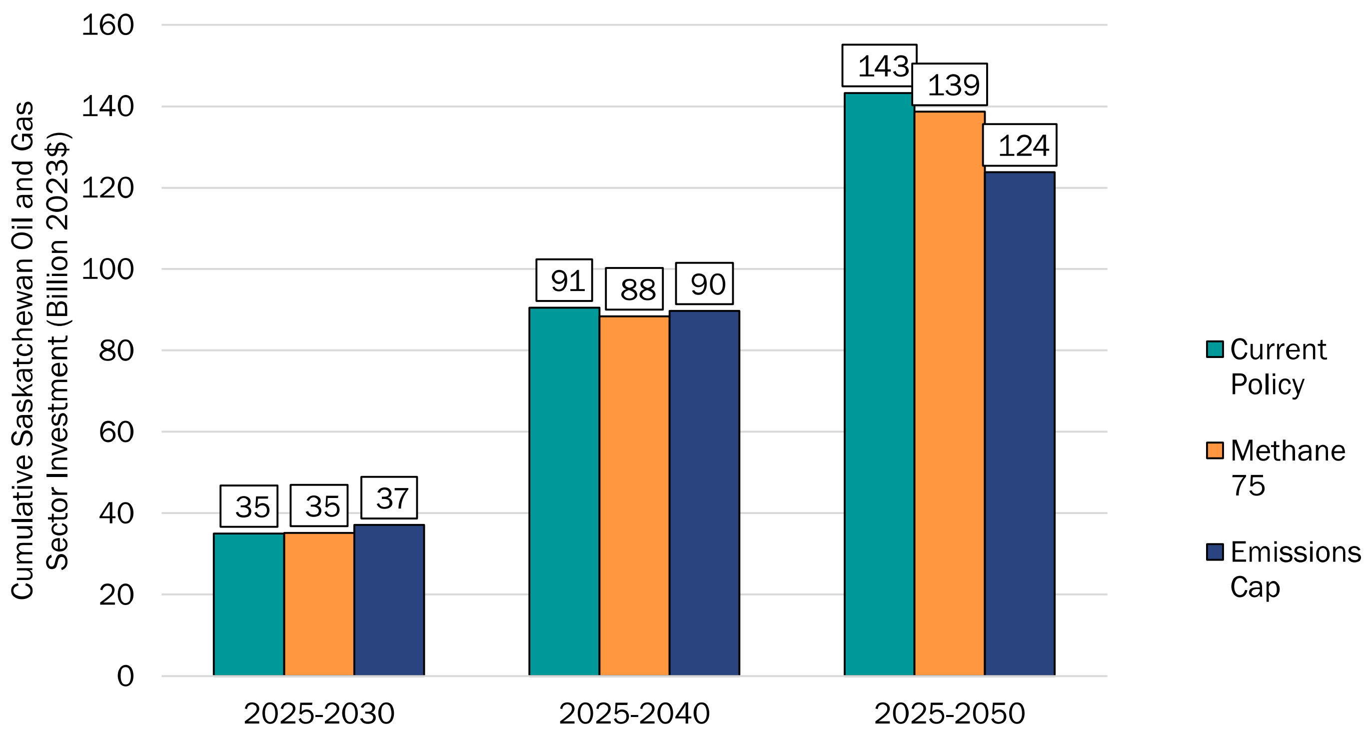
Overview | Approach | Impact analysis | Key insights | Supplementary slides

Figure 22: Change in cumulative Sask. provincial and federal government revenue from Current Policy, Reference Case (C$2023 billion)



Impacts on Oil and Gas sector investment

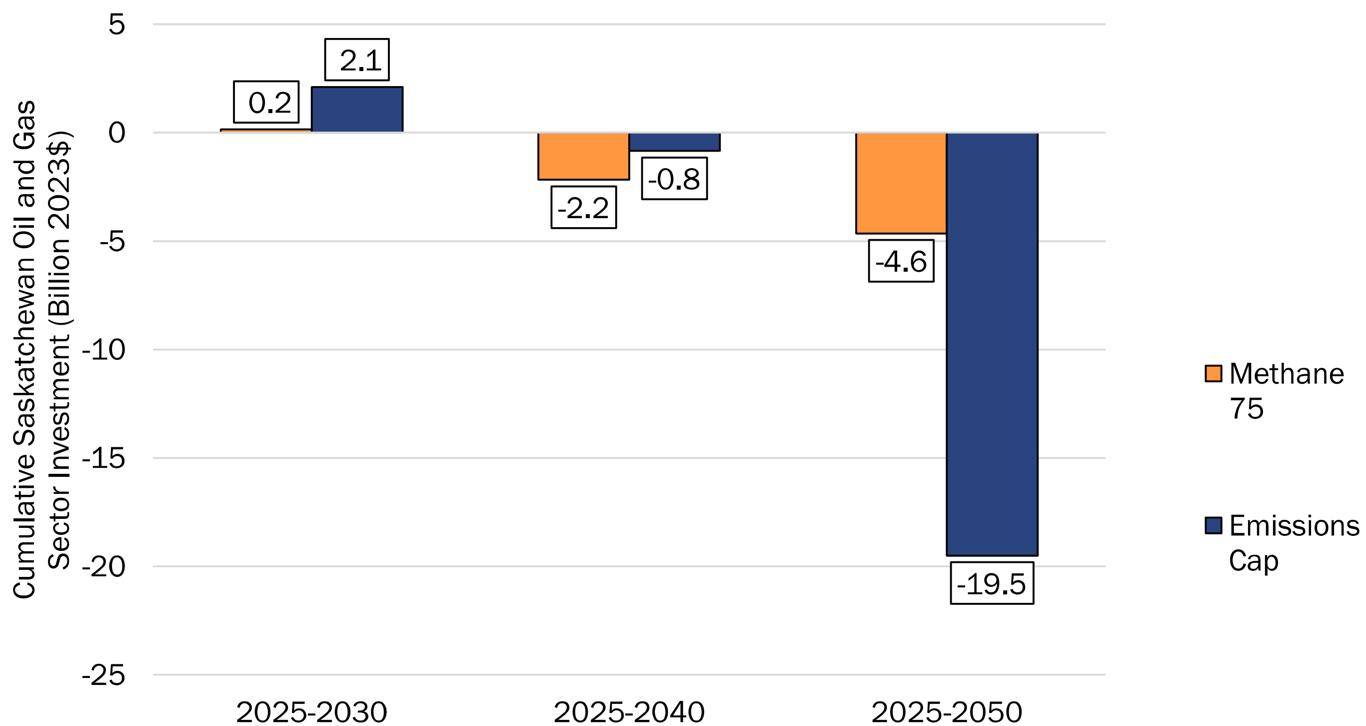
Figure 23: Cumulative Sask. oil and gas sector investment, Reference Case (C$2023 billion)



Impacts on Oil and Gas sector investment

Overview | Approach | Impact analysis | Key insights | **Supplementary slides**

Figure 24: Change in cumulative Sask. oil and gas sector investment from Current Policy, Reference Case (C$2023 billion)



SCHEDULE 5
TO THE REPORT OF THE ECONOMIC IMPACT
ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS
CAP

SEPTEMBER 03, 2024

THE CONFERENCE BOARD OF CANADA ECONOMIC
IMPACTS OF A GREENHOUSE GAS EMISSIONS CAP AND
METHANE 75 ON THE SASKATCHEWAN ECONOMY
DATED AUGUST, 2024

The Conference Board of Canada

Economic Impacts of a Greenhouse Gas Emissions Cap and Methane 75 on the Saskatchewan Economy

August 2024

Presented to: The Economic Impact Assessment Tribunal

Prepared by
The Conference Board of Canada

Contents

Introduction ... 1
Policy context ... 3
Scenario development under policy uncertainty ... 5
GHG Intensity Profiles Drive Required Production Cuts in the Two Scenarios ... 7
Direct compliance costs of the Cap and Methane 75 ... 9
Economic impact assessment ... 12
Assessing the economic impacts of production cuts in Canada ... 12
Oil and Gas production ... 12
GDP ... 13
Employment ... 14
Average and Cumulative Economic Impact ... 15
Assessing the economic impacts of production cuts in Saskatchewan ... 17
Oil and Gas production ... 17
GDP ... 18
Employment ... 19
Average and Cumulative Economic Impact ... 20
Conclusion ... 21
Appendix A: Methodology ... 23
Appendix B: Assumptions ... 24
Appendix C: Cap-and-Trade System ... 27
Appendix D: Structure of GHG Emissions in the Oil and Gas Sector ... 28
Appendix E: Detailed Results ... 30
Appendix F: Bibliography ... 31

Key findings

- Compliance with the proposed Oil and Gas Cap regulatory framework will require Canadian oil and gas production to be cut by roughly one-quarter in 2030 versus the Conference Board's baseline forecast, bringing combined oil and gas production down to 2017 levels (a reduction of 2.4 to 2.6 million barrels of oil equivalent per day).

- If allowable oil and gas emissions stay fixed at the proposed 2030 level (134 Mt CO2e per year), Canadian GDP will be 1.2 per cent ($44 billion) per year lower on average from 2030 to 2050 compared with a world without the Methane 75 and Cap policies. This impact lessens over time as technological efficiencies enable higher production.

- If allowable oil and gas emissions decline to zero by 2050 (including 25 Mt of compliance offsets), Canadian GDP will be 1.8 per cent ($70 billion) per year lower on average from 2030 to 2050 than baseline levels. This impact is stable over time, as the technological efficiencies enabling higher production are offset by the declining cap over the 20-year forecast.

- In Saskatchewan, production cuts result in a decline in GDP in 2030, by 2.2 per cent and 4.7 per cent in the Fixed and Declining Cap scenarios respectively. The recessionary impacts would be somewhat smaller than the decline experienced during the Financial Crisis (–5.3 per cent). Although Saskatchewan's economy would return to growth after 2030, it would be permanently smaller. Average annual GDP is forecast to be 3.6 per cent ($5.4 billion) and 7.0 per cent ($10.9 billion) lower than baseline in the Fixed and Declining Cap scenario from 2030 through 2050. Average annual oil and gas production will decline by 17 and 43 per cent, respectively, versus our baseline forecast. Cumulative investment in the sector will decline by similar magnitudes (24 to 46 per cent).

- Compared to the baseline forecast, average annual Saskatchewan government revenue falls by $1.1 and $2.0 billion (3.3 and 6.3 per cent) in the Fixed and Declining Cap scenarios. Reduced royalties account for one-quarter to one-fifth of this decline.

- We estimate the cumulative direct compliance costs of the Cap and the related Methane 75 regulation in Saskatchewan to be between $13.8 to $15.6 billion from 2027 to 2050. However, this estimate does not include the potential costs of major new carbon capture and direct air capture technologies that would need to be installed, particularly under the Declining Cap scenario. Long-term costs of these technologies remain too uncertain to estimate with precision.

Introduction

In December 2023, the Federal government announced two key initiatives to reduce greenhouse gas emissions in Canada's upstream oil and gas sector. The first is the "Regulatory Framework to Cap Oil and Gas Sector Greenhouse Gas Emissions"[1] (Cap), which proposes a legal upper bound of 131 to 137 megatonnes of CO2-equivalent (Mt CO_2e) of greenhouse gas (GHG) emissions in the sector by 2030.[2] The second is the "Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)" [3] (Methane 75), which identifies specific methane-based GHG emission reduction processes and abatement technologies (e.g., fugitive leak reduction, reduced venting, improved compressor seals, etc.) that could help reduce the sector's methane emissions by an estimated 75 per cent in 2030 from 2012 levels. Both the Cap and Methane 75 assert that the targeted emissions reductions can be achieved without the need for production cuts by improving the sector's GHG emissions intensity through methane abatement and CO2 abatement technologies such as carbon capture, utilization and storage (CCUS).

The Economic Impact Assessment Tribunal (EIAT) is an independent tribunal established pursuant to *The Saskatchewan First Act* to conduct economic impact assessments of Government of Canada initiatives on Saskatchewan. On April 8, 2024, the Cap and Methane 75 were referred to the Tribunal by Order in Council (154/2024).

The Order of Council 154/2024 directed the EIAT to review the anticipated impact on investment, production, and royalty tax revenues, and other costs required to comply with the new federal policies. Specifically, Schedule "A" of the Order of Council asks the following questions:

- What is the estimated compliance cost of the Oil and Gas Cap and Methane 75 between 2019 up to and including 2030?

- What is the estimated compliance cost of the Oil and Gas Cap and Methane 75 between 2030 up to and including 2050?

- What is the forecasted effect of the Oil and Gas Cap and Methane 75 on oil and gas investment, production, and royalty/tax revenues in Saskatchewan between 2019 and each of 2030, 2040 and 2050?

---

[1] Environment and Climate Change Canada, "A Regulatory Framework to Cap Oil and Gas Sector Greenhouse Gas Emissions", 7 December 2023.
[2] The legal upper bound includes the use of 25 Mt CO_2e of emissions compliance flexibility.
[3] Government of Canada, "Canada Gazette, Part 1, Volume 157, Number 50: Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)", Government of Canada, December 16, 2023

- What is the forecasted cumulative effect of the Oil and Gas Cap and Methane 75 on the provincial economy that regulatory compliance will cause as of the end of each of 2030, 2040 and 2050?

As part of its review, the EIAT commissioned The Conference Board of Canada to conduct economic modelling of these federal initiatives' impact on Saskatchewan's economy. Our analysis focuses on the long-term macroeconomic impacts of the Cap and Methane 75 policies in Saskatchewan and across Canada.[4] In line with recent findings by The Conference Board of Canada[5], our analysis shows the Cap and Methane 75 policies will reduce the sector's GHG emissions by 80 Mt CO_2e in 2030 versus our baseline forecast, but achieving this emissions-reduction goal will require cuts to production that will be concentrated in Alberta, Saskatchewan, and British Columbia .

Leveraging our national and provincial macroeconomic models, we estimate these policies will reduce annual average real GDP—expressed in 2023 dollars—in Canada by between $43.8 billion (1.2 per cent) to $70.0 billion (1.8 per cent) from 2030 to 2050 versus the Conference Board's baseline outlook. In Saskatchewan, real GDP is forecast to be $5.4 billion (3.6 per cent) to $10.9 billion (7.0 per cent) lower on average per year versus the baseline.

The wide range of impacts reflects the policy uncertainty beyond 2030. The Cap framework and Methane 75 regulations are key steps toward achieving net zero emissions in the oil and gas sector by 2050. However, as of July 2024, there are no details as to how these approaches will evolve beyond 2030. In addition, while the Cap regulatory framework signals a broader goal of achieving net zero emissions in the upstream oil and gas sector by 2050, the current draft lacks details on how emissions will be further reduced between 2030 and 2050. To handle this uncertainty, two scenarios[6] are modelled that diverge in terms of the future policy trajectory of the Cap beyond 2030[7]:

1. **Fixed Cap scenario** assumes the 2030 policies (e.g., the legal upper bound, allowable emissions offsets, etc.) remain unchanged to 2050.
2. **Declining Cap scenario** assumes that by 2050 the oil and gas sector's emissions Cap falls to zero and the legal upper bound remains 25 Mt CO_2e.[8]

The Cap is at an early stage of development and lacks many cost and implementation details. As a result, our analysis makes assumptions, at various points, to enable estimates

[4] Our forecast models extend to 2045. The final 5 years (2046-2050) reported throughout this analysis are based on extrapolations of the forecasts (see Appendix A for details).
[5] Conference Board of Canada, "Economic Impacts from Cap and Trade on Oil and Gas", Conference Board of Canada, March 2024.
[6] Methodological details and assumptions for both scenarios are provided in Appendix A.
[7] These two scenarios also differ in terms of the success of the Methane 75 regulations. In the Fixed Cap case, we assume all provinces achieve the 75 per cent reduction in methane emissions. In the Declining Cap scenario Saskatchewan achieves only a 60 per cent reduction in methane emissions, implying a greater level of production cuts are required for compliance with the Cap in 2030.
[8] The regulation's emissions Cap differs from the legal upper bound by the amount of allowable GHG emissions covered under the "compliance flexibility options". In both scenarios, we assume compliance flexibility remains constant at 25 Mt CO_2e for the Canadian oil and gas sector.

of its economic impact. These assumptions include how the Canada-level policies will be implemented in specific provinces and how the Cap and Methane 75 will interact with one another.

In addition to the macroeconomic impacts of these policies, the direct compliance costs of the Methane 75 regulations and Cap framework will be substantial—potentially in the range of $53.1 to $55.5 billion Canada-wide and $13.2 to $15.6 billion in Saskatchewan between 2027 and 2050. Direct compliance costs of the Cap would include the cost to purchase carbon emissions offsets. Other direct costs of these policies are largely administrative and assumed to be relatively negligible. Omitted from these cost estimates, however, are the major infrastructure investments required to achieve the GHG intensity reductions forecast in both scenarios, but particularly the Declining Cap scenario where emissions intensity declines significantly. These direct costs are too uncertain to estimate with reasonable accuracy.

Policy context

The Cap seeks to reduce the upstream oil and gas sector's GHG emissions to a legal upper bound of 131 to 137 megatonnes of CO2-equivalent (Mt CO_2e) in 2030, when the proposed framework would come into force. Throughout this report we treat the legal upper bound as the mid-point of this range, namely 134 Mt CO2e. The legal upper bound includes the use of up to 25 Mt CO2e of compliance flexibility credits as outlined in the Cap regulatory framework. Specifically, the compliance flexibility credits allow for emissions to exceed the emissions cap up to the legal upper bound.

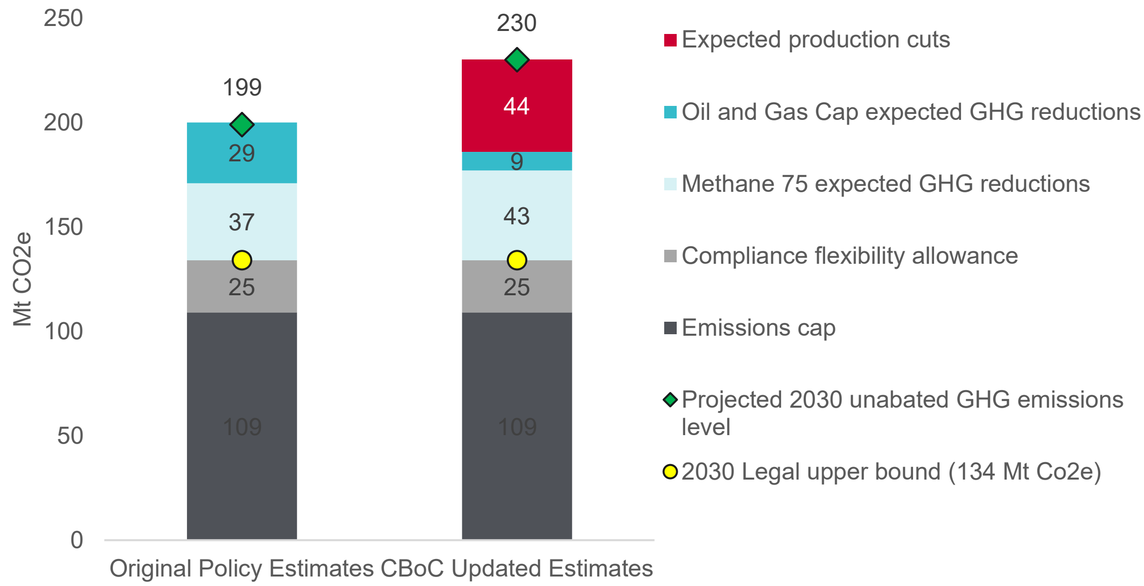
In Chart 1, the Original Policy Estimates bar outlines how the federal government expects the Cap and Methane 75 will achieve the 134 Mt CO2e goal in 2030. The emissions reduction levels start from 199 Mt CO2e, which is the level of emissions assuming oil and gas production in 2030 is equal to the Canada Energy Regulator's (CER) projections under their Canada Net Zero scenario and emissions intensity remains constant at 2019 levels. The Cap calls for 29 Mt of GHG emissions reductions to be achieved through a combination of approaches that include efficiency gains, use of carbon capture utilization and storage (CCUS), use of solvents in the oil sands, and electrification. Methane 75 aims to build on previously achieved methane-based GHG emissions reductions to reach a total abatement level of 37 Mt CO2e, based on the 2023 National Inventory Report (NIR) GHG levels, through prescribed technological and operational solutions to be installed at upstream oil and gas facilities.[9]

---

[9] Any methane abatement between 2019 and 2027 will also contribute to the 37Mt of projected abatement estimated by the federal government. These include the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector), also known as Methane 45, which came into effect between 2020 and 2023.

Chart 1: Lower baseline emissions in 2030 and greater technological reductions in GHG intensity avoid production cuts in the official policy outlook

Upstream oil and gas sector GHG emissions in 2030 and components reducing emissions to the legal upper bound, federal government versus Conference Board outlook



Source: Environment and Climate Change Canada, Conference Board of Canada

The CBoC Updated Estimates bar in Chart 1 shows how the Conference Board's estimates diverge from the federal government's estimates due to various assumptions and updated data sources.

Our starting point for emissions is higher; we project total unabated emissions of 230 Mt in 2030, holding emissions intensity fixed at 2019 levels, compared to 199 Mt in the federal government estimates. This difference is driven by two things. First, the latest NIR GHG calculations released in 2024 use a higher global warming potential for methane emissions.[10] This change means that for a given level of methane emissions, the CO2e emissions are higher than in the Original Policy Estimates scenario. It is also why the implementation of Methane 75 reduces emissions by 43 Mt in our estimates versus 37 Mt in the Original Policy Estimates. Second, total production in the sector is 4 per cent higher in the Conference Board's baseline forecast than in the CER forecast in 2030. Higher production leads to higher emissions if we hold emissions intensity fixed.

The other major difference between the two estimates is the assessed reduction in non-methane GHG intensity achieved by 2030 through CCUS and other technologies. The

---

[10] In May 2024, Environment and Climate Change Canada (ECCC) released the updated 2024 NIR that included a change to the global warming potential assigned to methane from a factor of 25 times that of CO2 to 28 times that of CO2. This change, and other revisions to historic GHG emissions levels, result in a major increase (approximately 20 per cent) in GHG emissions attributed to Canada's upstream oil and gas sector which largely reflects higher methane emissions in CO2 equivalent terms.

federal estimate is 29 Mt, while our estimate is 9 Mt. This is largely due to an assumed slower implementation of CCUS emissions abatement across the sector.

The combined effects of higher assumed production, higher CO2e emissions from methane, and a slower pace of non-methane emission reductions result in oil and gas emissions being expected to exceed the regulatory framework limit by 44 Mt in 2030.[11] This will require production cuts at upstream oil and gas facilities to comply with the Cap.

It remains unclear whether the GHG emission reductions outlined in the Cap and Methane 75 will be adjusted based on the new NIR emissions data. For our analysis, we assume that the emissions targets remain unchanged, and our impact estimates reflect the revised NIR data.

Scenario development under policy uncertainty

To analyze the economic impacts of Methane 75 and the Cap on the Canadian and Saskatchewan economies, assumptions are made about the future evolution of the sector's emission cap and legal upper bound. The 2030 emissions cap and legal upper bound are those specified in the Cap regulatory framework, but to achieve net zero emissions by 2050 the emissions cap must be reduced to zero. The timing and mechanisms for reducing the emissions cap (and possibly the legal upper bound) to zero remain unstated in the proposed framework.

Further uncertainty surrounds how these federal policies will be applied at the provincial level. Methane 75 and the Cap will be implemented at the facility level, the oversight and regulation of which varies by province. However, there is no indication as to how these policies will be distributed by jurisdiction. As such we assume that provinces are responsible for their share of emissions reductions based on their recent share of the sector's production and emissions. This has important implications when estimating provincial impacts. Relatedly, there is no discussion of how any GHG targets and expected GHG reductions under Methane 75 and the Cap will interact with one another. For example, if expected reductions from Methane 75 fall short in a province, would its obligation under the Cap change?

Other uncertainties concern the technical and economic feasibility of the proposed Methane 75 solutions to achieve the intended emissions reductions. The Methane 75 regulations—unlike the Cap regulatory framework—do not specify the level of GHG reductions to be achieved. Rather this regulation prescribes the use of certain technological and operational solutions that it asserts will contribute to 37 Mt CO2e of GHG reductions in 2030 from non-abated levels.

[11] Assuming each jurisdiction achieves a 75% reduction under Methane 75.

To address these uncertainties, two policy scenarios are developed: a Fixed Cap scenario and a Declining Cap scenario. The assumptions made in these two scenarios are detailed below.

Fixed Cap scenario

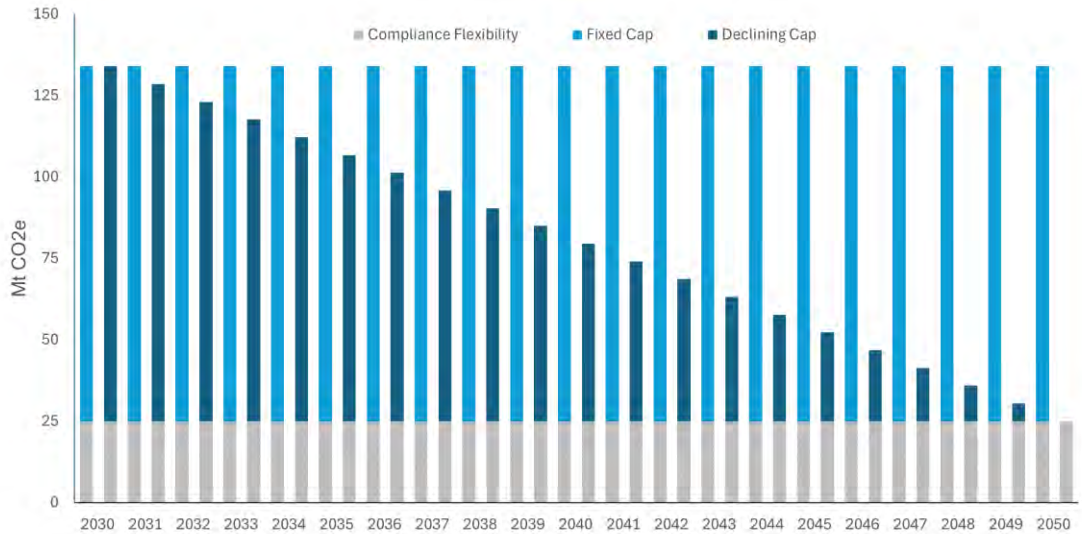
- Methane 75: Each jurisdiction is assumed to achieve the planned 75 per cent reduction in methane emissions.
- Cap: The 134 Mt CO2e legal upper bound comes into force in 2030 and remains unchanged to 2050, as does the 25 Mt of compliance flexibility.
- Production cuts: The technically achievable emissions reductions under the regulatory framework do not meet the legal upper bound and thus production cuts are required for regulatory compliance in 2030.
- Intensity: We assume emission intensity reductions through 2030 consistent with recent historical improvements, expected methane emission reductions under Methane 75, and future capacity from known CCUS projects. In the longer term, we assume significant deployment of additional CCUS capacity. Consequently, continued improvements in emissions intensity after 2030 reduce the magnitude of production cuts relative to our baseline.

Declining Cap scenario

- Methane 75: All jurisdictions are assumed to achieve the 75 per cent emissions reduction except Saskatchewan, where only a 60 per cent reduction in methane emissions is assumed to be economically feasible. Saskatchewan is then assumed to be responsible for any shortfall in emissions reductions required to meet the Cap's the legal upper bound and any implied production cuts to oil and gas production needed to comply with the Cap in 2030 are assumed to be made in the province.
- Cap: The legal upper bound of 134 Mt CO2e takes effect in 2030 and is gradually lowered to 25 Mt CO2e by 2050. This decline assumes that the Cap will reach zero by 2050, while compliance flexibility remains constant at 25 Mt CO2e throughout the forecast period.
- Production cuts: Since the Declining Cap scenario starts from higher emissions in 2030 due to lower anticipated reductions from the Methane 75 regulation, it requires larger production cuts starting in 2030 to comply with the cap. In addition, we assume that the additional reductions needed to stay under the cap will come from Saskatchewan, as we assume that Saskatchewan will only achieve a 60 per cent reduction in methane emissions. Therefore, more production cuts will be required in Saskatchewan to comply with the cap in 2030 compared to the Fixed Cap scenario.
- Intensity: Although we expect lower near-term methane abatement, we assume annual emission intensity reductions consistent with the net-zero CER forecast through 2045. This more optimistic outlook relies on significantly increased deployment of abatement technologies, including those not yet commercially scaled, such as direct air capture. Given the long forecast horizon of more than 25 years, this outlook is reasonable but remains highly uncertain.

Chart 2 illustrates our assumptions regarding the cap and compliance flexibility for both the Fixed Cap and Declining Cap scenarios.

Chart 2: We assume that the legal upper bound remains unchanged to 2050 in the Fixed Cap scenario and declines gradually in the Declining Cap scenario.
Total Oil and Gas Emissions Cap Assumptions



Source: Conference Board of Canada

The Conference Board of Canada's higher baseline oil and gas production forecast, higher starting point for emissions, and assumed lower CCUS based abatements result in higher GHG emissions in 2030 compared to the CER forecast baseline used in the federal regulatory framework. Specifically, our forecast estimates 178 Mt CO2e emissions in the Fixed Cap scenario and 182 Mt CO2e in the Declining Cap scenario. This means the sector would need to reduce emissions by 44 Mt in the Fixed Cap scenario and by 48 Mt in the Declining Cap scenario to meet the 134 Mt legal upper bound.

GHG Intensity Profiles Drive Required Production Cuts in the Two Scenarios

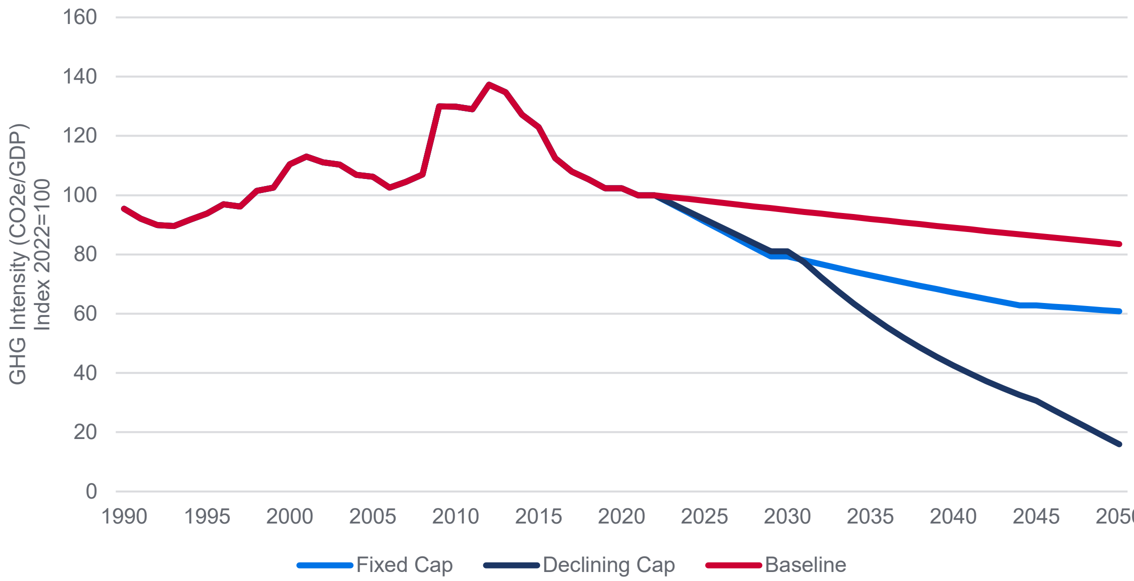
All else equal, a higher level of GHG intensity—the ratio of GHG emissions to GDP—requires larger production cuts to achieve a set level of emissions reductions. In both our scenarios, production cuts are required to get to the legal upper bound for emissions in 2030 versus our baseline forecast.[12] A critical factor determining the magnitude of these cuts in 2030 and beyond is the anticipated level of GHG intensity in the sector.

GHG intensity has improved significantly since its peak in 2012 during the oil sands boom. In our baseline, Fixed Cap and Declining Cap scenarios, we assume that GHG intensity will continue to improve (i.e. decline) throughout the forecast period. However, the Declining Cap scenario requires a much larger reduction in GHG intensity to meet the stricter net-zero target by 2050. (See Chart 3).

[12] That means, starting in 2030, an immediate negative shock on output is imposed to bring the sector's GHG emissions to the 134 Mt CO2e legal upper bound.

Chart 3: GHG intensity declines sharply from baseline in both scenarios, but emissions intensity declines the most in the Declining Cap scenario, reflecting a tighter cap.

(GHG intensity (CO2e/GDP) in the oil and gas sector, Canada, historic and forecast, Index 2022=100)



Sources: Statistics Canada, Conference Board of Canada

In the Fixed Cap Scenario, emissions intensity in 2030 is lower compared to the baseline, mainly due to the impacts of complying with the Methane 75 regulation. After 2030, the emissions intensity in the Fixed Cap scenario decreases (improves) at about twice the rate of the baseline, as we assume that 31 Mt of CCUS capacity will be installed between 2030 and 2050, resulting in a total of 40 Mt of new CCUS between 2024 and 2050, in line with the CER Canada Net Zero scenario. This level of abatement would allow production to increase while remaining compliant with the fixed emissions cap. Oil and gas production therefore recovers to within 4 per cent of the baseline outlook by 2050 in this scenario.

The emissions intensity improvements in the Declining Cap scenario must be significantly more optimistic than in the baseline and Fixed Cap scenarios to meet the legal cap of 25 Mt CO2e by 2050. From 2023 to 2045, the annual rate of decline in GHG intensity in the Declining Cap scenario averages 5.1 per cent, which is similar to the CER assumed rate of 5.3 per cent to 2050 in their Canada Net Zero scenario. Achieving this level of reduction will require a significant increase in GHG abatement from current levels. Even with the rapid acceleration in abatement, production levels do not improve. Compliant production levels in the Declining Cap scenario remain one-quarter (25 per cent) below the baseline throughout the 20-year forecast, as GHG intensity improvements are offset by the lowering of allowable emissions levels.

We make no specific claims about the technological solutions or costs required to achieve the projected rate of GHG intensity reduction. However, achieving this rate will require a substantial increase in investment in CCUS abatement and other emerging abatement technologies such as direct air capture (DAC) and direct ocean capture (DOC).

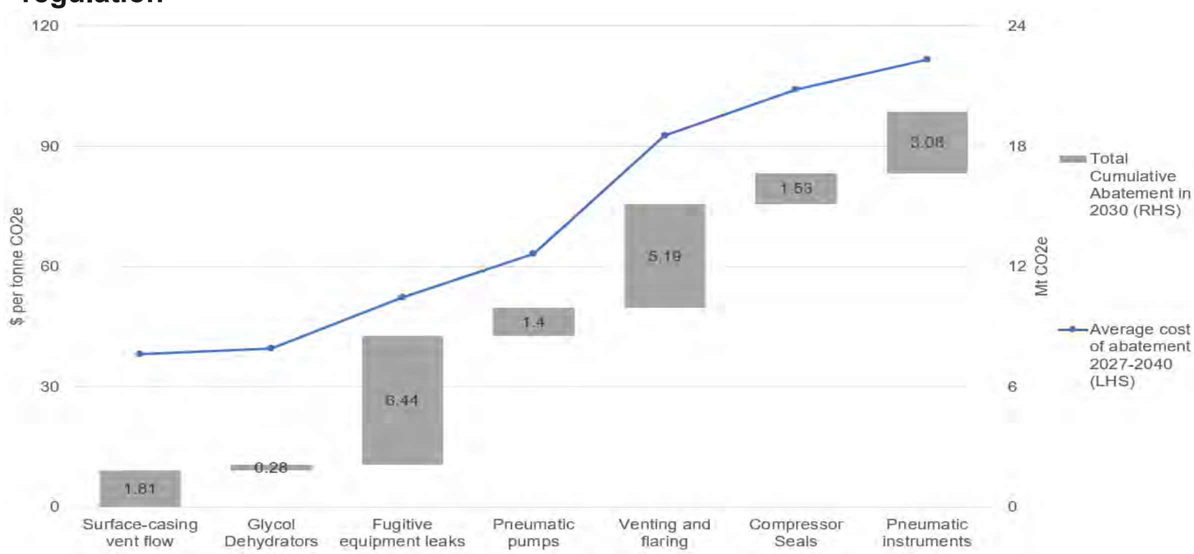
Since GHG intensity and production cuts are directly related, for a given emissions cap, lower intensity reductions will result in higher levels of production cuts. Although technological uncertainties may suggest an overly optimistic outlook for the Declining Cap scenario, it's important to remember that the policy forecast itself—with a rapid decline in the cap and no increase in emissions allowances—is also highly uncertain. These uncertainties may offset each other to some extent.

Direct compliance costs of the Cap and Methane 75

Methane 75 and the Cap expect that firms will invest in emissions abatement technologies between now and 2050 in order to comply with both sets of regulations and represent significant costs to firms in the sector.

Chart 4 summarizes the seven compliance pathways prescribed in the Methane 75 regulation, their expected additional 20 Mt of emissions reductions, and the estimated cost per tonne of CO_2e abated by each technology.[13] These costs and abatement levels are used to estimate the direct compliance costs of Methane 75.

Chart 4: Abatement and costs by technology pathway proposed in the Methane 75 regulation



Sources: Environment and Climate Change Canada, Conference Board of Canada.

[13] This calculation is based on a global warming potential (GWP) for methane of 28 which is in line with the 2024 National Inventory Report. Using a GWP factor of 25 as was used in the 2023 National Inventory Report suggests Methane 75 will reduce emissions by 18Mt of CO_2e between 2027 and 2030.

In Saskatchewan, Methane 75 compliance costs between 2027 and 2030 are projected to be $2.9 billion under the Fixed Cap scenario and just over $2.3 billion under the Declining Cap scenario, where less methane abatement investment occurs meaning only a 60 per cent reduction in methane emissions is achieved. At the national level, direct capital costs for the upstream oil and gas sector are projected to exceed $6.9 billion in the Fixed Cap scenario and $6.3 billion in the Declining Cap scenario. These costs reflect investments in the GHG abatement technologies and processes outlined in the Methane 75 regulations (see Table 1).

Beyond 2030, the annual direct costs of Methane 75 decrease significantly as no further capital expenditures are assumed. Compliance costs in this period are based on the ongoing operation and maintenance of new technologies. Under the Fixed Cap scenario, these costs are $4.7 billion per decade in Saskatchewan and $11.2 billion per decade for Canada. Under the Declining Cap scenario, compliance costs are slightly lower, at $3.7 billion per decade in Saskatchewan and $10.2 billion per decade for Canada.

Overall, the direct costs for the equipment and processes outlined in the Methane 75 regulations, along with operation and maintenance costs from 2024 to 2050, are projected to total just over $12.2 billion in Saskatchewan and $29.2 billion in Canada under the Fixed Cap scenario. Under the Declining Cap scenario, these costs are estimated to be just under $9.8 billion in Saskatchewan and $26.8 billion in Canada.

Table 1: Direct compliance costs for Methane 75 and the Cap in Saskatchewan and Canada
($ 2023 millions)

Policy	Saskatchewan			Canada		
	2027–2030	2031–2040	2041–2050	2027–2030	2031–2040	2041–2050
Methane 75						
Fixed Cap Scenario	$2,902	$4,658	$4,658	$6,951	$11,158	$11,158
Declining Cap Scenario	$2,321	$3,727	$3,727	$6,370	$10,227	$10,227
Cap						
Fixed Cap Scenario						
Carbon credits expenditures	$162.5	$1,625	$1,625	$1,250	$12,500	$12,500
Additional GHG abatement technologies	-	unknown	unknown	-	unknown	unknown
Declining Cap Scenario						
Carbon credits expenditures	$162.5	$1,625	$1,625	$1,250	$12,500	$12,500
Additional GHG abatement technologies	-	unknown	unknown	-	unknown	unknown

Source: Conference Board of Canada.

The costs associated with the Cap policy result primarily from two types of direct compliance costs: (a) the cost of purchasing carbon offsets through the policy's compliance flexibility mechanism; and (b) the cost of implementing additional GHG abatement technologies that reduce the sector's emissions intensity. Covered oil and gas facilities will also incur additional administrative costs related to the submission of annual reports on production levels and GHG emissions using the specified quantification methods. Other direct costs will include expenses for verification by an authorized third-party auditor. However, these administrative costs are expected to be relatively minor.

The Cap sets total allowable GHG emissions at 109 Mt CO2e in 2030 and we assume this initial level of allowed emissions will be enabled through freely provided emissions credits. The legal upper bound of 134 Mt CO2e in GHG emissions includes the additional 25 Mt CO2e in annual compliance flexibility credits that will be priced in the cap-and-trade market.[14] The precise structure of the credit provision, pricing and market are not yet determined, but for our analysis we assume these compliance flexibility credits will cost a constant $50 per tonne, as set out in the framework, and be purchased starting in 2030. In Saskatchewan, emissions credits purchasing costs are expected to amount to $162.5 million per year in Saskatchewan. To estimate these costs, we assume Saskatchewan's oil and gas facilities purchase 3.25 Mt CO2e of the 25 Mt CO2e of compliance flexibility carbon credits each year.[15] In Canada, this translates into a total cost of $1,250 million between 2027–2030, $12.5 billion between 2031–2040 and $12.5 billion between 2041 and 2050.

We assume that investments in GHG intensity improvements continue beyond 2030 under both scenarios (see Chart 3). In the Declining Cap scenario, additional investments will be required to meet the more stringent net-zero cap; while not explicitly estimated the compliance costs related to installing carbon abatement technologies to comply with the Cap will be greater under the Declining Cap scenario. In both scenarios, these costs are expected to be driven primarily by the expansion of CCUS and the implementation of emerging technologies such as direct air capture (DAC).

The future costs and timing of these technologies remain uncertain. Although the CER estimates that the cost of DAC could be in the range of $400 to $450 per tonne of CO2e,[16] this technology is not yet available on the scale needed to achieve significant GHG reductions. It is unclear whether costs will fall significantly as production scales up. Even the current costs of CCUS, a proven technology in commercial use in Canada and the United States, can vary widely. For example, a September 2023 report by the International Institute for Sustainable Development estimated that CCUS projects in Canada will cost between $28 and $150 per tonne of CO2 abated.[17] Accurate cost estimates for CCUS abatement,

---

14 See Appendix C for a description of how a Cap-and-Trade system operates.
15 This is in proportion to the province's current 13 per cent share of the sector's GHG emissions and assuming a fixed price of $50 per tonne for carbon credits under both scenarios. Any increase in the price or number of credits purchased would lead to a one-to-one increase in direct compliance costs.
16 Canada Energy Regulator, "Canada's Energy Future 2023 Energy Supply and Demand Projection to 2050", pg 128, June 20, 2023.
17 The IEA CCUS pipeline includes the actual or planned year of final investment decision. This is the point in the project planning process where the decision of whether to proceed with the investment is taken, after which contracts with suppliers are signed and capital is provisioned.

both now and 20 years from now, would require detailed facility-by-facility data, which is beyond the scope of this report.

Economic impact assessment

The lion's share of the impact of the federal policies on the economy will be driven by the expected cuts in oil and gas production required for firms to meet the legal upper bound in 2030. These cuts are assumed to start in the year 2030 when the legal upper bound comes into force. To assess these impacts, we compare The Conference Board's baseline forecast for the national and provincial economy against the Fixed Cap and Declining Cap scenarios.

Assessing the economic impacts of production cuts in Canada

The Cap and Methane 75 specify their policy objectives and key parameters at a Canada-wide level. The macroeconomic impacts of the policies are estimated via The Conference Board of Canada's national macroeconomic model, using an approach similar to the one implemented to study the impacts of these policies on the Alberta economy.[18]

In each year of the forecast, oil and gas production is set such that, for the given GHG intensity level (see Chart 3), total emissions from the upstream oil and gas sector are no higher than the scenario-specific legal upper bound. The legal upper bound in the Fixed Cap scenario remains fixed at 134 Mt CO_2, meaning the production shock (the difference between production in the scenario and the baseline) dissipates over time as GHG intensity is improved by the addition of new CCUS capacity. In the Declining Cap scenario, the cap falls from 134 in 2030 to 25 Mt CO_2 in 2050; given the more rapid decline in GHG intensities in this scenario, this translates into a fixed level of production cuts each year from 2030 to 2050 versus the baseline forecast.

Oil and Gas production

On a production basis, in the Fixed Cap scenario oil and gas production decreases by 2.4 million barrels of oil equivalent per day (boe/d) in 2030, relative to the Conference Board's baseline. (See Chart 4.) In the Declining Cap scenario, due to the lower level of methane abatement, a slightly larger production cut of 2.6 million boe/d is needed in 2030 for compliance with the Cap.

Over time, in the Fixed Cap scenario, oil and gas production starts to recover again as the sector's emissions intensity improves (e.g., from additional CCUS capacity). However, oil and gas output in Canada does not return to baseline levels over the forecast period in

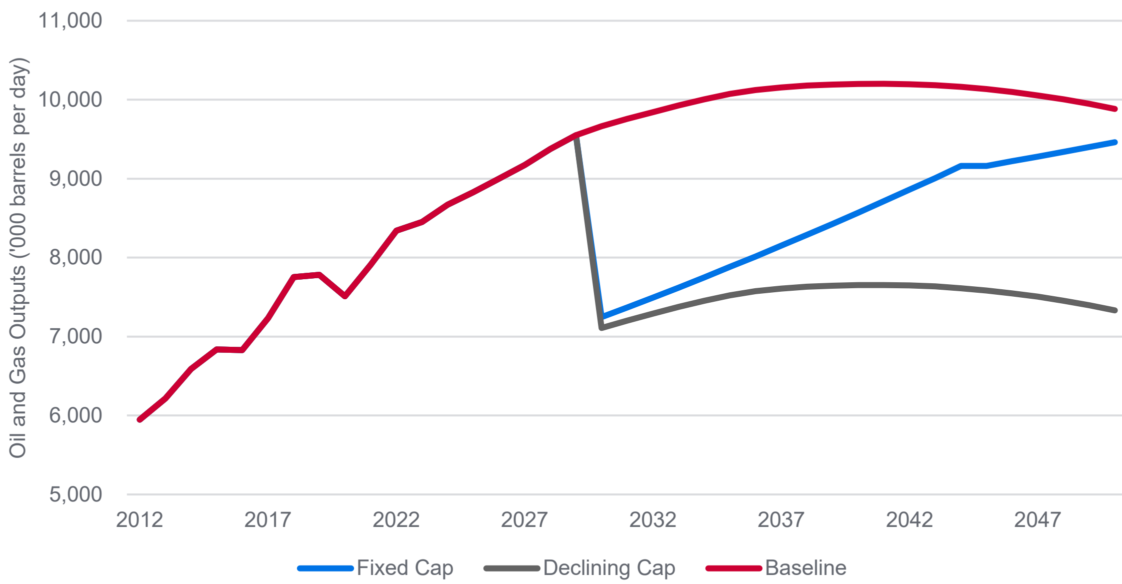
---

[18] The Conference Board of Canada, "Economic Impacts From Cap and Trade on Oil and Gas", Conference Board of Canada, March 2024.

either scenario. By 2050, output is 4.3 per cent (421,000 boe/d) lower in the Fixed Cap scenario than in the baseline. In the Declining Cap scenario, oil and gas production remains well below the baseline forecast, as we assume that the cap decreases to zero by 2050. In 2050, oil and gas production is 7.3 million boe/d in the Declining Cap scenario, or 2.6 million boe/d (–25.8 per cent) lower than in the Conference Board's baseline forecast.

Chart 4: Oil and gas output in Canada does not return to baseline levels across the forecast in either scenario

(Oil and gas output, thousands of barrels of oil per day equivalent, Canada, 2012–2050)



Note: Natural gas in billions of cubic feet converted to thousands of barrels of oil equivalent using a conversion factor of 185.
Source*:* Conference Board of Canada, Canada Energy Regulator, Rigzone.com

GDP

We project that GDP in the oil and gas extraction sector will decline by 24.1 per cent in the Fixed Cap scenario and by 25.6 per cent in the Declining Cap scenario in 2030, compared to an increase of 1.2 per cent in the baseline. These impacts on oil and gas GDP are much larger than the sector has experienced over the past few decades; the largest decline in real production since the turn of the century occurred over two years from 2007 to 2009, where GDP in the sector declined by 7 per cent.[19]

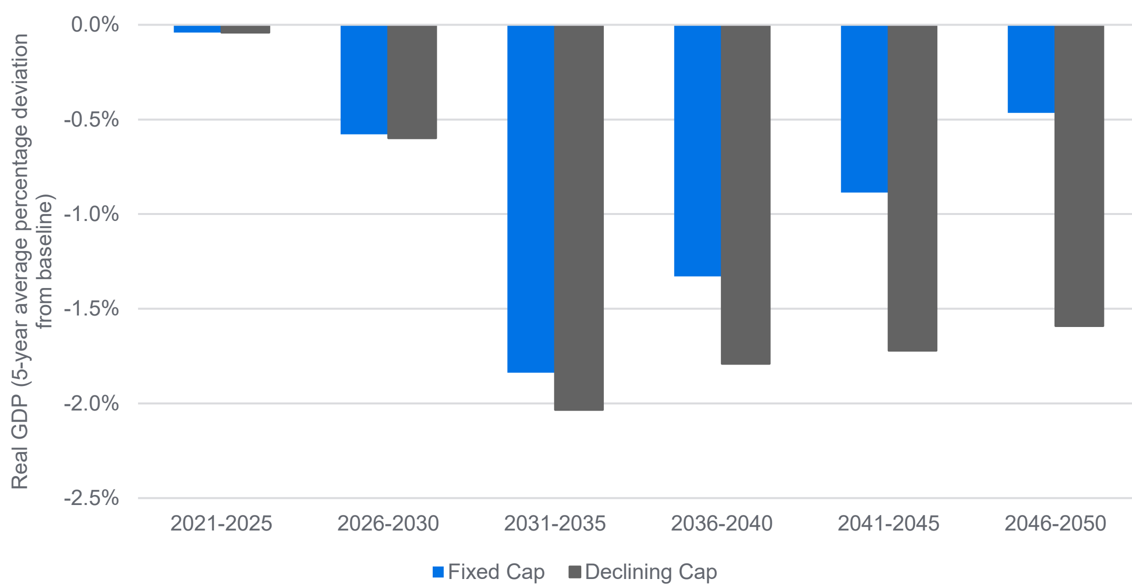
The reduced output in the oil and gas sector under the two scenarios translates into significant reductions in total economic activity. (See Chart 5.) For example, in 2030, we expect that GDP will grow by 2 per cent in 2030 in the baseline, but that GDP growth will be essentially zero in the Fixed and Declining Cap scenarios. Periods of weak economic growth, such as those projected in these scenarios, can often feel similar to a recession, even if there is no actual recession.

---

[19] Statistics Canada Table: 36-10-0449-01

After this initial shock, GDP does return to growth, but the level of GDP remains at a lower level than would have been expected in the baseline. From 2030 to 2050, GDP is $43.8 (1.2 per cent) to $70.0 billion (1.8 per cent) lower on average each year than in our baseline scenario. A gap of approximately $70 billion dollars remains through to 2050 for the Declining Cap scenario, while the level of GDP almost fully returns to the baseline level in the Fixed Cap scenario, a gap of $13.3 billion remains in 2050.

Chart 5: Total GDP is 1.2 and 1.8 per cent lower each year on average from 2030 to 2050 relative to baseline in the Fixed Cap and Declining Cap scenarios, respectively.
(Real GDP, 5-year average percentage deviation from baseline, Canada, 2021–2050)



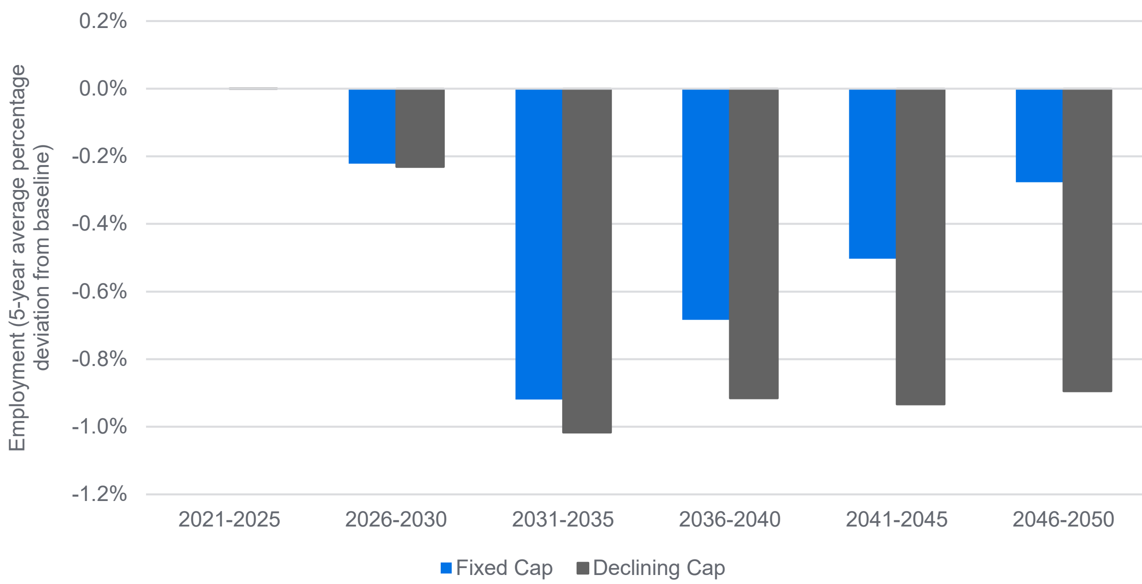
Source*:* Conference Board of Canada

Employment

Initially the employment effects in both scenarios are similar; employment is 212,000 lower than the baseline in the Fixed Cap scenario and 223,000 lower in the Declining Cap scenario. Annual employment is 147,000 (0.6 per cent) to 231,000 (0.9 per cent) lower on average in the Fixed Cap and Declining Cap scenarios than in our baseline (see Chart 6). As with GDP, the employment impact in the Fixed Cap scenario declines over time. In 2050, employment 47,000 is lower compared to the baseline in the Fixed Cap scenario and remains 239,000 below baseline the Declining Gap scenario.[20]

[20] It is important to note that while we model the impact on employment and the wider employment dynamically and monetary policy does offset some of the economic impacts of the shock, we do not explicitly account for reskilling and upskilling. To the extent that some workers in the oil and gas sector are able to reskill and transition to other occupations or sectors rather than remain unemployed this may attenuate the longer-term impact of production cuts in the oil and gas sector to some degree.

Chart 6: Total employment is 0.6 and 0.9 per cent lower each year on average from 2030 to 2050 relative to baseline in the Fixed Cap and Declining Cap scenarios, respectively.
(Employment, 5-year average percentage deviation from baseline, Canada, 2021–2050)



Source*:* Conference Board of Canada

Average and Cumulative Economic Impact

The average annual difference between our scenarios and the baseline, as well as the cumulative effect for several economic indicators, are shown in Tables 3 and 4. It is important to note that these numbers represent the deviation from the baseline—the difference between the projected economy without Methane 75 and the emissions cap and our scenarios—and should not necessarily be interpreted as an actual decline relative to current levels of activity.

Fixed cap scenario vs. baseline

In the Fixed Cap scenario, cumulative Canadian GDP is 1.1 per cent lower over the forecast period than the baseline scenario, amounting to $920 billion in reduced cumulative economic activity versus the baseline outlook. (See Table 3.) Output and investment in the oil and gas sector across Canada falls by 15.3 per cent and 22.3 per cent respectively. In this scenario, Federal government revenue is 1.8 per cent lower 2030 to 2050—a cumulative reduction of $295 billion compared to the baseline. After the initial shock, GDP, employment, oil and gas output and government revenue all continue to grow in the Fixed Cap scenario.

Table 3: Forecasted economic impacts versus baseline forecast in Canada of Methane 75 and the Oil and Gas Cap, Fixed Cap Scenario, 2030–2050

	Annual		Cumulative	
GDP (2023$b)	–$43.8	–1.2%	–$920	–1.1%
Investment (2023$b)	–$17.1	–2.4%	–$359	–2.3%
Oil and Gas Sector* (2023$b)	–$8.9	–22.3%	–$187	–20.8%
Oil and Gas Sector Output (1000's boe/d)	–1,550.9	–15.5%	–32,568	–15.4%
Employment (person - year, 1000's)	–147.0	–0.6%	–3,088	–0.6%
Federal Government revenue (current$b)	–$14.1	–1.9%	–$295	–1.8%

* Defined as oil and gas extraction (NAICS 211).
Source: Conference Board of Canada

Declining cap scenario vs. baseline

In the Declining Cap scenario, cumulative Canadian GDP is 1.8 per cent lower over the forecast period than the baseline scenario, amounting to $1,470 billion in reduced cumulative economic activity versus the baseline outlook between 2030 and 2050. (See Table 4.) Output and investment in the oil and gas sector across Canada falls by 25.4 per cent and 33.3 per respectively, in this scenario. Federal government revenue is 2.9 per cent lower 2030 to 2050—a cumulative reduction of $471 billion compared to the baseline. Nationally, oil and gas production remains essentially flat at around 7.0 to 7.5 million barrels-equivalent per day over the 20-year forecast in the Declining Cap scenario.

Table 4: Forecasted economic impacts versus baseline forecast in Canada of Methane 75 and the Oil and Gas Cap, Declining Cap Scenario, 2030–2050

	Annual		Cumulative	
GDP (2023$b)	–$70.0	–1.8%	–$1,470	–1.8%
Investment (2023$b)	–$27.0	–3.6%	–$566	–3.6%
Oil and Gas Sector* (2023$b)	–$14.2	–33.8%	–$299	–33.2%
Oil and Gas Sector Output (1000's boe/d)	–2,550	–25.4%	–53,548	–25.4%
Employment (person - year, 1000's)	–231	–0.9%	–4,861	–0.9%
Federal Government revenue* (current $b)	–$22.4	–2.9%	–$471	–2.9%

* Baseline includes mining activities. Analysis assumes full impact on upstream oil and gas sector.
Source: Conference Board of Canada

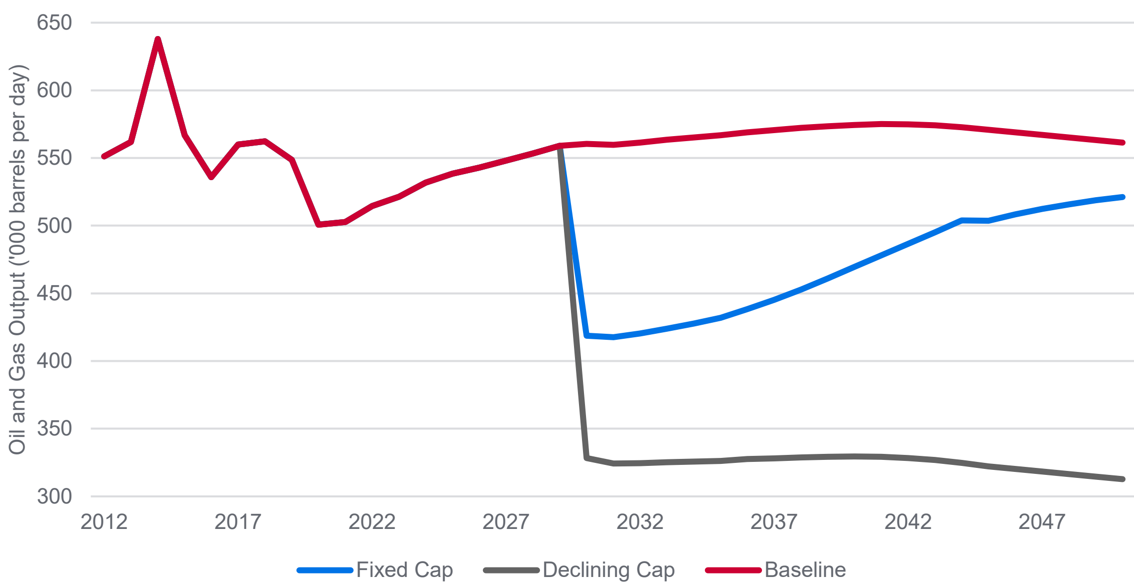
Assessing the economic impacts of production cuts in Saskatchewan

Most of the economic impact is driven by Saskatchewan's oil and gas sector. Based on Saskatchewan's share of Canada's oil and gas sector, the production cuts required to comply with the GHG emissions cap result in an initial production decline of 25.3 and 41.4 per cent relative to the baseline in the Fixed and Declining Cap scenarios, respectively. (See Chart 7.)

Oil and Gas production

In the Fixed Cap scenario, oil and gas production decreases by 142,000 barrels of oil equivalent per day (boe/d) in 2030, relative to the Conference Board's baseline. In the Declining Cap scenario, due to the 60 per cent methane abatement, a larger production cut of 232,000 boe/d is required in 2030 for compliance with the cap. As in the Canadian forecast, the province's oil and gas production does gradually recover in the Fixed Cap scenario, almost returning to near-baseline levels by the end of the scenario period, whereas the sector's production remains essentially flat between 2030 and 2050 in the Declining Cap scenario.

Chart 7: Oil and gas output in Saskatchewan does not return to baseline levels across the forecast in either scenario.
(Oil and gas output, thousands of barrels of oil per day equivalent, Saskatchewan, 2012-2050)



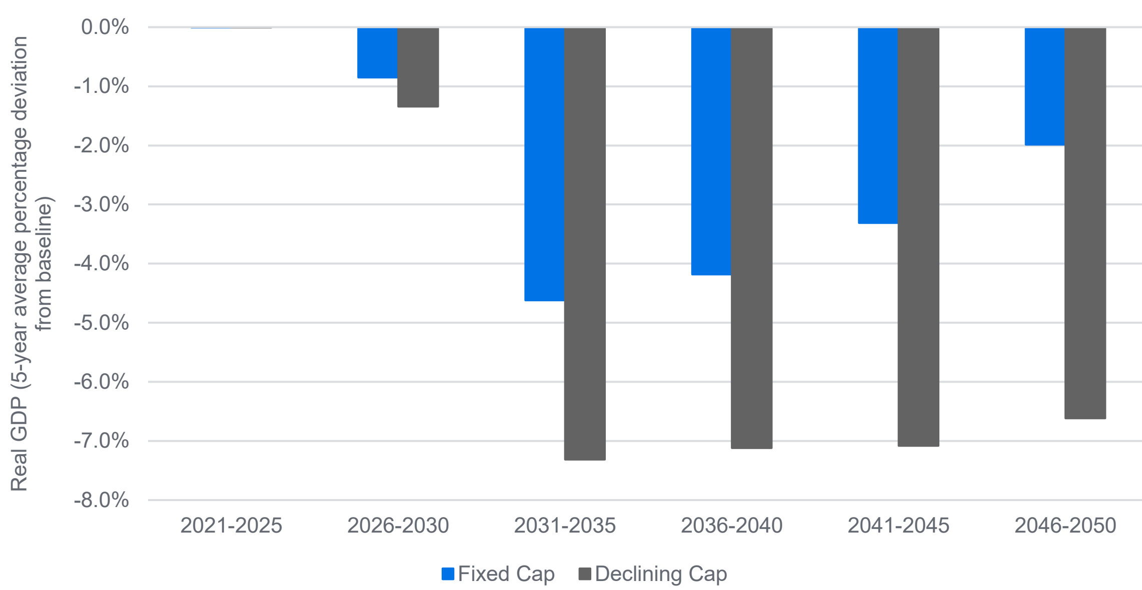
Note: Natural gas in billions of cubic feet converted to thousands of barrels of oil equivalent using a conversion factor of 185.
Source*:* Conference Board of Canada, Canada Energy Regulator, Rigzone.com

GDP

The reduced output in the oil and gas sector under the two scenarios leads to persistently weaker economic activity relative to our baseline forecast. (See Chart 8.) Initially, Saskatchewan's total real GDP is reduced by 4.2 per cent and 6.7 per cent in the Fixed and Declining Cap scenarios, respectively—relative to the baseline in 2030. Unlike at the national level where GDP in 2030 was flat in both scenarios, these policies induce a recession in Saskatchewan. In 2030, GDP declines by 2.2 and 4.7 per cent in our scenarios, which is a little smaller than the decline in GDP experienced during the financial crisis (–5.3 per cent in 2009).[21]

After this initial decline, Saskatchewan's economy does return to growth, however, the level of GDP remains below our baseline forecast. Between 2030 and 2050, GDP is on average $5.4 billion (3.6 per cent) to $10.9 billion (7.0 per cent) lower annually in the respective Fixed Cap and Declining Cap scenarios compared to our baseline scenario. In the Fixed Cap scenario, the GDP gap relative to the baseline narrows to $2.8 billion (1.5 per cent) by 2050. However, the gap does not narrow in the Declining Cap scenario, resulting in a GDP gap of $11.7 billion (6.4 per cent) by 2050.

Chart 8: Saskatchewan's GDP declines by an average of 3.6 and 7.0 per cent from 2030 to 2050 relative to baseline.
(Real GDP, 5-year average percentage deviation from baseline, Saskatchewan, 2021–2050)



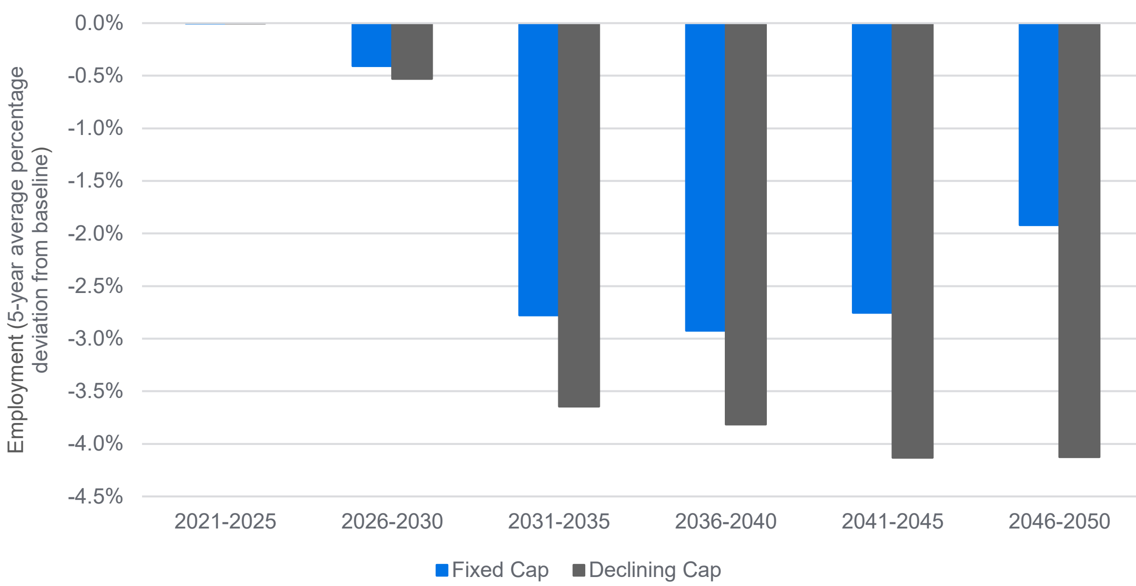
Source: Conference Board of Canada

[21] Statistics Canada Table: 36-10-0402-01

Employment

Persistently weaker economic activity in Saskatchewan relative to baseline also has implications for employment and population growth in the province. In 2030, total employment in the province declines by between 13,000 and 17,000 relative to baseline, boosting the unemployment rate in 2030 by 0.7 to 0.9 percentage points (See Table A2). Over time, these impacts spill over into other sectors, and increased unemployment leads to reduced migration flows. As a result, between 2030 and 2050, employment in Saskatchewan is 19,000 (2.6 per cent) to 29,000 (3.9 per cent) lower in the Fixed and Declining Cap scenarios, respectively, than in the baseline. (See Chart 9.)[20]

Chart 9: Employment is on average 2.6 and 3.9 per cent below baseline from 2030 to 2050 in the Fixed Cap and Declining Cap scenarios, respectively.
(Employment, 5-year average percentage deviation from baseline, Saskatchewan, 2021–2050)



Source*:* Conference Board of Canada

As a result of weaker economic activity in Saskatchewan, population in both scenarios is lower than the baseline. Relatively fewer employment opportunities in the province result in lower inward migration and higher outward migration in both scenarios relative to the baseline. These lower population flows accumulate over time meaning the peak effect on population happens later in the forecast period. In the Fixed Cap scenario, the peak effect on population occurs in 2045, where Saskatchewan's population is 38,000 (2.4 per cent) lower than in the baseline. This effect declines by 2050 to 23,000 (1.3 per cent) fewer people. In the Declining Cap scenario, the peak effect on population occurs in 2045, where 52,000 fewer people (3.2 per cent) reside in the province compared with the baseline; this wedge remains fairly constant through 2050.

Average and Cumulative Economic Impact

Table 6 and 7 show the average annual difference between our scenarios and the baseline, as well as the cumulative effect or difference between the scenarios and the baseline for Saskatchewan.

Fixed cap scenario vs. baseline

After the initial shock, Saskatchewan GDP, employment, oil and gas output and government all continue to grow in the Fixed Cap scenario but a slower growth rate than in our baseline. In the Fixed-Cap scenario, cumulative GDP is 3.5 per cent lower over the forecast period than the baseline scenario, amounting to a cumulative $114 billion in reduced economic activity versus the baseline outlook between 2030 and 2050 (see Table 6). Output and investment in the oil and gas sector in Saskatchewan is 17.4 per cent and 23.7 per cent lower than baseline, respectively. Provincial government revenue is 3.3 per cent lower 2030 to 2050—a cumulative reduction of $22 billion compared to the baseline.

Table 6: Forecasted economic impacts versus baseline forecast in Saskatchewan of Methane 75 and the Oil and Gas Cap, Fixed Cap Scenario, 2030-2050

	Annual		Cumulative	
GDP (2023$b)	–$5.4	–3.6%	–$113.8	–3.5%
Investment (2023$b)	–$1.2	–4.9%	–$25.1	–4.7%
Oil and Gas Sector* (2023$b)	–$1.0	–24.9%	–$21.4	–23.7%
Oil and Gas Sector Output (1000’s boe/d)	–99.0	–17.4%	–2,079.2	–17.4%
Employment (person - year, 1000's)	–19	–2.6%	–405	–2.5%
Government revenue* (current $b)	–$1.1	–3.3%	–$22.1	–3.3%
Royalty revenue (current $b)	–$0.2	–4.0%	–$3.2	–3.5%

* Includes oil and gas extraction (NAICS 211) and coal mining (NAICS 2121), the latter of which account for approximately 1.4 per cent of the sector output.
Source: Conference Board of Canada

Declining cap scenario vs. baseline

In the province, cumulative GDP is 7.0 per cent lower over the forecast period than the baseline scenario, amounting to $230 billion in reduced economic activity versus the baseline outlook between 2030 and 2050 (see Table 7). Output and investment in the oil and gas sector in Saskatchewan are 42.9 per cent and 46.2 per respectively compared to baseline between 2030 and 2050. Provincial government revenue is 6.7 per cent lower 2030 to 2050—a cumulative reduction of $43 billion compared to the baseline.

Table 7: Forecasted economic impacts versus baseline forecast in Saskatchewan of Methane 75 and the Oil and Gas Cap, Declining Cap Scenario, 2030-2050

	Annual		Cumulative	
GDP (2023$b)	–$10.9	–7.0%	–$229.9	–7.0%
Investment (2023$b)	–$2.2	–8.8%	–$45.6	–8.6%
Oil and Gas Sector* (2023$b)	–$2.0	–47.2%	–$41.8	–46.2%
Oil and Gas Sector Output (1000's boe/d)	–243.8	–42.9%	–5,118.8	–42.9%
Employment (person - year, 1000's)	–29	–3.9%	–618	–3.9%
Government revenue* (current $b)	–$2.0	–6.3%	–$43.3	–6.7%
Royalty revenue (current $b)	–$0.5	–12.5%	–$11.4	–13.7%

* Baseline includes mining activities. Analysis assumes full impact on upstream oil and gas sector.
Source: Conference Board of Canada

Conclusion

The proposed Cap regulatory framework and Methane 75 regulations to reduce GHG emissions in the oil and gas sector are ambitious policies intended to put Canada's oil and gas sector on the path to net zero emissions by 2050. This laudable objective in combating Canada's contributions to climate change will not, however, come about without major and disruptive changes to the sector, including the potential for production cuts in 2030 when the Cap regulatory framework first comes into force. Our analysis of these policies indicates initial production cuts in 2030 of around 2.5 million barrels of oil equivalent per day (boe/d) will be required across the oil and gas sector—bringing production down by about one-quarter from our baseline forecast to the equivalent of 2017 output levels.

Our analysis shows that production cuts in the sector following a fixed emissions cap through 2050 would result in a decline in Canada's real GDP of $43.8 billion per year on average—or 1.2 per cent—relative to the baseline from 2030 to 2050. For Saskatchewan, the province's real GDP would be lower by $5.4 billion or 3.6 per cent on average to relative the baseline.

Under the Fixed Cap scenario, we estimate that the direct compliance costs to adopt the technologies and processes, including the purchase of compliance flexibility credits, would total $55.6 billion for the sector with $15.7 billion of those compliance costs being borne by the sector in Saskatchewan.

Under a scenario where the oil and gas sector legal upper bound falls steadily from 134 Mt in 2030 to 25 Mt, production cuts relative to the baseline forecast would be sustained at a fairly constant level (about 2.5 million boe/d) each year, resulting in an average reduction in real (2023$) GDP of $70.0 billion per year—or 1.8 per cent—from 2030 to 2050 relative to the baseline in Canada. For Saskatchewan, the province's real GDP declines by $10.9 billion or 7.0 per cent on average per year to relative the baseline.

The macroeconomic scenarios used to generate these impact assessments necessarily embed a number of assumptions about the future trajectory of these policies, CO2 abatement technologies and of the output and performance in the oil and gas sector itself. Several assumptions in both scenarios tend to be more conservative in terms of the likely economic impacts, notably the relatively rapid improvement in GHG intensity in the sector. On the other hand, more impactful assumptions are also included. For example, the Methane 75 and Cap policies are assumed not to change in light of recent historic revisions to the NIR's emissions estimates and, in the Declining Cap scenario, Saskatchewan bears the entirety of the additional emissions reduction burden from missing its Methane 75 target.

Despite the necessary assumptions and caveats made, the overall results are clear: Outright reductions in oil and gas production including the winding down and closing of certain facilities in Alberta and Saskatchewan will be required under the current Cap regulatory framework. There are a number of technological solutions that can help ameliorate this direct reduction in output, but there is little time to implement those alternatives. Under the current framework, governments and operators will need to start investing immediately and significantly if the negative economic impacts from setting the oil and gas sector on a net zero pathway are to be meaningfully mitigated.

Appendix A: Methodology

The oil production cuts represent a significant change from the Conference Board's autumn editions of the Canadian and Provincial Long-Term Outlooks. The cuts to oil production are assumed to affect mostly exports, such that they result in few downstream impacts on domestic refining or other manufacturing. The model simulations are produced over the 2030 to 2045 forecast period, incorporating varying assumptions on the oil production cuts required to achieve the 2030 emissions cap. Through the economic linkages represented in our economic models, we can quantify the effects of a reduction in oil production on a wide range of economic variables. This exercise is done by comparing each variable of interest in the two shock scenarios to those in the baseline outlooks.

Given the dynamic nature of the models, the impact of reduced oil production is felt throughout the economy. Industries that are closely tied to oil production are directly affected—in particular, mining services. Exports of oil are also affected, having an impact on transportation and other industries. In addition to these direct and indirect impacts, the economic models capture induced impacts. For instance, oil production is capital intensive, such that the immediate effect of a cut to oil production is reflected in a loss in corporate profits. This will impact investment in the energy sector, but also across other industries due to supply chain impacts and other knock-on effects. Employment is also reduced in the energy and other sectors as the impact on the economy broadens. Reduced employment will have repercussions on income, tax revenues, consumer spending, which, in turn, will have further knock-on effects on other output categories, investment and so forth.

Appendix B: Assumptions

For our baseline, and all our scenarios, we use the 2024 National GHG Inventory report that includes the most recent historical revisions to GHG emissions. These revisions raise the starting point for estimating any emissions reductions required to meet the targets set out in the federal Oil and Gas Cap and Methane 75 policies.

In our Fixed Cap scenario, we assume different rates of intensity reduction before and after 2030. Between 2022 and 2030 under Methane 75, we assume the 75 per cent reduction below 2012 levels in methane-based emissions is achieved by all provinces. This drives a significant decline in methane emissions intensity. Non-methane emissions intensity is assumed to decline in line with its 2005–2022 average, reducing emissions by 9Mt. This level of decline is consistent with the scale of CCUS projects in the IEA's CCUS project pipeline which can realistically be expected to be completed by 2030. Between 2030 and 2045, we assume methane intensity declines so that the sector continues to achieve methane emissions levels 75 per cent below 2012 levels even as production grows. We assume that CCUS removes an additional 31Mt of emissions per year by 2045 compared with 2030. Because our scenario assumes a slower rollout of CCUS by 2030 (9Mt vs 19Mt) we assume a faster rollout after 2030 to catch up to the CCUS capacity outlined in the CER's Canada Net Zero scenario by 2050.

In our Declining Cap scenario, between 2022 and 2030 our assumptions are consistent with our Fixed Cap scenario except under Methane 75, we assume methane-based emissions in Saskatchewan are only reduced by 60 per cent relative to 2012 levels. Overall, this produces a slower overall decline in emissions intensity up to 2030 compared with the Fixed Cap scenario. Between 2030 and 2045 we assume overall emissions intensity declines by 6.4 per cent per year between 2030 and 2045. This is faster than the 5.1 per cent annual decline in emissions intensity in the CER Canada Net Zero between 2030 and 2050. Half of this gap reflects the payback we expect from a faster rollout of CCUS and other abatement technologies to recover from the slower CCUS rollout we assume before 2030. The other half reflects the lower terminal level of emissions we expect in the oil and gas sector (25Mt vs 32Mt in the CER's Canada Net Zero scenario) which implies a tighter cap than the CER assumed.

Our baseline scenario assumes an annual change in GHG emissions intensity of –0.6 per cent between 2022 and 2050. This is a little slower than the assumed –1.2 per cent reduction in annual emissions intensity in the CER Current Measures scenario between 2030 and 2050. This scale of emissions reduction is consistent with the already-implemented federal Methane 45 regulations which imply 10Mt of emissions reductions by 2025 and just over 12Mt by 2030. The regulations estimate that 4Mt of these effects will be reflected in the 2022 numbers, implying that an additional 8Mt of abatement will be achieved through Methane 45 by 2030. Our baseline scenario implies a reduction in emissions of 10 Mt between 2022 and 2030 at 2022 production levels.

In both scenarios Canadian upstream oil and gas facilities are assumed to:

- continue to reduce the GHG intensity of their production between now and 2030.
- fully utilize the 25Mt of compliance flexibility embedded in the emissions cap by purchasing offsets at $50 per tonne; and,
- reduce production if sector emissions are greater than the proposed legal upper bound of 134 Mt CO2e.[22]

We assume a much smaller amount of CCUS capacity is installed and operating as compared to the estimates embodied in the federal policies. As a result, our estimate of non-methane GHG emissions efficiencies achieved by 2030 is significantly lower than the 29 Mt of efficiency gains projected by ECCC. Achieving the ECCC estimate of non-methane GHG emissions reduction would require that most of CCUS investments which are planned but not yet under construction—around 14 Mt CO2e according to the IEA—are realized and delivered on time, alongside other investments in emissions reductions. To date, only 3Mt of this pipeline of CCUS capacity has a final investment decision date.[23]

The proposed oil and gas sector emissions cap includes a degree of compliance flexibility, where covered facilities have the option to use other compliance instruments to offset up to 25Mt CO2e of GHG emissions. Eligible compliance units include i) domestic offset credits, ii) contributions to a decarbonization fund and iii) internationally transferred mitigation outcomes (ITMOs). In both scenarios, firms fully utilize these instruments to offset 25Mt of GHG emissions at a cost of $50 per tonne which reduces profits in the oil and gas sector. We assume that half of the offsets are domestic, and half are international, with the purchase of domestic offsets representing a redistribution of profits between sectors within the Canadian economy.

We assume that either the costs of investing in intensity improvements to comply with updated federal regulations are higher and/or the benefits of doing so are lower than value of the lost production. As a result, to achieve the legal upper bound of 134 Mt of GHG emissions in each scenario under the assumptions described above, upstream oil and gas firms are forced to cut production relative to the baseline scenario. Under the Fixed Cap scenario, we assume Saskatchewan would be responsible for production cuts equal to its GHG emissions intensity weighted share of oil and gas production. Under the Declining Cap scenario, we assume Saskatchewan would be solely responsible for any additional production cuts required to comply with the legal upper bound in the sectors GHG emissions due to lower-than-expected emissions abatement relating to Methane 75.

We simulate the national, Saskatchewan provincial, and fiscal models from 2023 to 2045. In order to generate results for the 2046–2050 period we extend our model results using the following assumptions:

---

[22] For simplicity, these production cuts are assumed to occur uniformly across the upstream oil and gas sector.
[23] The IEA CCUS pipeline includes the actual or planned year of final investment decision. This is the point in the project planning process where the decision of whether to proceed with the investment is taken, after which contracts with suppliers are signed and capital is provisioned.

- Assume that the decline in oil and gas production in the Baseline scenario continues in line with the decline in growth rates experienced between 2040 and 2045.
- Assume emissions intensities in the Baseline and Fixed Cap scenarios decline at the same rate as was experienced in 2045 for the Baseline scenario. Assume emissions intensity declines in the Declining Cap scenario so that overall sector emissions reach 25Mt in 2050, thus accounting for a continuation of the fixed production cuts modelled between 2030 and 2045.
- Calculate the production cuts required for 2046–2050 in the Fixed Cap Scenario, given the emissions intensity profile for that period, in order to remain compliant with the 134Mt emissions cap. The production cuts in the Declining Cap Scenario are assumed to remain constant.
- Generate baseline projections for our key macroeconomic variables for 2046–2050 by extending the observed trends for: GDP, investment, employment, government revenues and royalties.
- Calculate the average elasticities between 2040 and 2045 for the observed oil and gas shock and the model computed shock minus control values. The shock for each key variable for the Fixed Cap and Declining Cap scenarios is equal to this elasticity times the oil and gas production shock for each year between 2046–2050.

Appendix C: Cap-and-Trade System

A Cap-and-Trade System is meant to create an economic incentive to reduce GHG emissions of companies and facilities that it covers. As a starting point the system operator (typically a government ministry or regulator) has participating companies provide their "base year" level of GHG emissions. It then allocates initial "emissions allowances", usually one per reported tonne of GHG emitted, at this base emissions level. This is often termed a company's "initial allocation". The system operator would then set a target "Cap" for emissions from the sector that reflects the desired reduction in GHGs from this initial level.

For companies covered by the system, emissions reductions towards the Cap translate into cuts they need to make in order to hit that future target. Companies that can cut their emissions by more than needed to stay below their prescribed limit, in effect, will have "unused" emissions credits that they can sell/trade. Companies that are not able to reduce their emissions to below their prescribed limit then will need to buy/trade emissions credits to maintain compliance with the legislated emissions cap. The system typically tracks company's emissions levels, and their sale or use of emissions credits, over a "compliance period" of two or three operating years to recognize that not all business activities are perfectly aligned with a calendar year.

This leads to the "Trade" part of the system where companies can buy and sell emissions credits. Like any marketplace, if there is a high demand for emissions credits, but a limited supply, the price of credits will go up. Conversely, if companies can reduce their emissions to below their cap level, and thus have many unused credits to sell, then the price for those emissions credits will go down.

As the emissions Cap level is consistently lowered over time, the expectation is that the purchase price for emissions credits goes up thus creating an economic incentive for companies to cut their emissions through more efficient operations and invest in emissions reduction technologies and processes. The net result is that emissions of companies covered by the system decline over time towards the cap level.

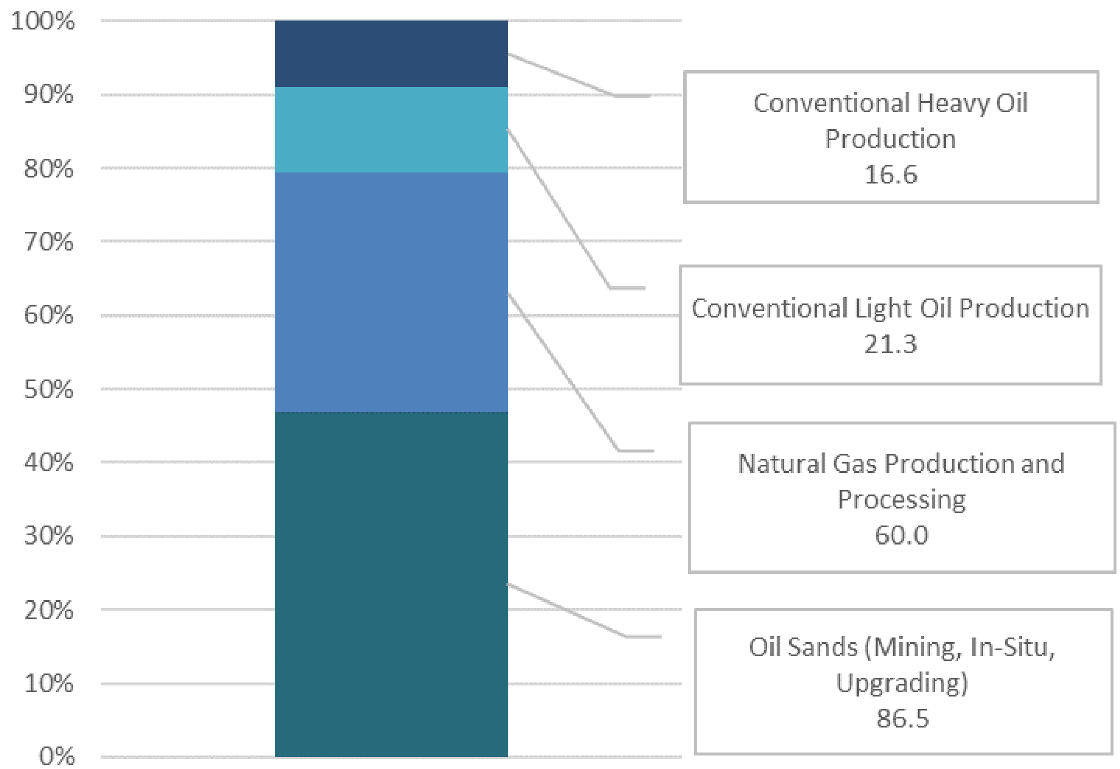
Issues seen with Cap-and-Trade systems include having "extra" initial allowances given to participants thus removing the need for companies to do anything to comply with the prescribed emissions cap. Similarly, in some cases, the cap on allowed emissions is set so high that no pressure to cut emissions is created. There are also challenges in determining if an emissions credit that is for sale is indeed one that has generated emissions savings. To resolve such matters Cap-and Trade systems often require extensive audit and verification procedures.

Appendix D: Structure of GHG Emissions in the Oil and Gas Sector

The 2024 National Inventory Report shows that the upstream oil and gas sector GHG emissions for the sub-sectors covered by the Oil and Gas Cap and Methane 75 policies have a fundamentally different composition nationally than in Saskatchewan.

Nationally, the sector's GHG emissions profile largely reflects that of Alberta. The two main sub-sectors, in terms of GHG emissions, are Natural Gas Production and Processing (32 per cent of covered total) and Oil Sands (47 per cent). (See Chart D1)

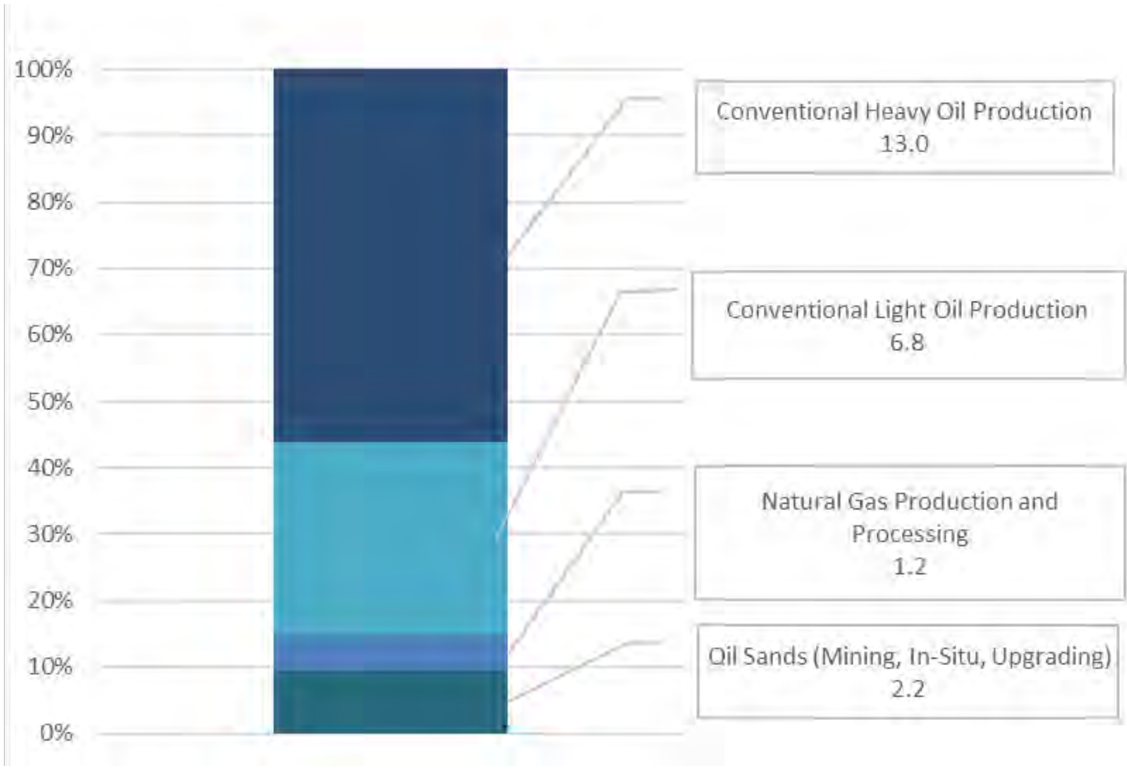
Chart D1: Upstream Oil and Gas Sector GHG Emissions - Canada.
(per cent share of sector total, and Mt CO2e levels, 2022)



Sources: Environment and Climate Change Canada, Conference Board of Canada.

In Saskatchewan, the two main sub-sectors in terms of GHG emissions are Conventional Heavy Oil Production (56 per cent) and Conventional Light Oil Production (29 per cent). (See Chart D2)

Chart D2: Upstream Oil and Gas Sector GHG Emissions - Saskatchewan.
(per cent share of sector total, and Mt CO2e levels, 2022)



Sources: Environment and Climate Change Canada, Conference Board of Canada.

This illustrates the different nature of the technologies and processes for GHG abatement that would prevail in Saskatchewan compared to the nation and to the other major oil and gas producing other provinces.

Appendix E: Detailed Results

Table A1: Initial impacts from Production Cuts in Canada (2030)
Deviations from baseline forecast in 2030 and FY 2030/31

	Fixed Cap scenario	Declining Cap
GDP (%)	–2.1	–2.2
Oil and Gas Sector (%)	–25.0	–26.4
Investment (%)	–3.3	–3.5
Oil and Gas Sector (%)	–39.2	–41.2
Unemployment rate (percentage points)	0.8	0.9
Employment (%)	–1.0	–1.0
Government revenue (%)	–1.8	–1.9

* Government finances are reported in nominal terms in this table and throughout the report.
Source: Conference Board of Canada

Table A2: Initial impacts from Production Cuts in Saskatchewan (2030)
Deviations from baseline forecast in 2030 and FY 2030/31

	Fixed Cap scenario	Declining Cap
GDP (%)	–4.2	–6.7
Oil and Gas Sector (%)	–25.3	–41.4
Investment (%)	–5.0	–8.1
Oil and Gas Sector (%)	–28.0	–45.1
Unemployment rate (percentage points)	0.7	0.9
Employment (%)	–2.0	–2.6
Government revenue (%)	–3.4	–5.4

* Government finances are reported in nominal terms in this table and throughout the report.
Source: Conference Board of Canada

Appendix F: Bibliography

Environment and Climate Change Canada, “A Regulatory Framework to Cap Oil and Gas Sector Greenhouse Gas Emissions”, Government of Canada, December 2023.

Government of Canada, “Canada Gazette, Part 1, Volume 157, Number 50: Regulations Amending the Regulations Respecting Reduction in the Release of Methane and Certain Volatile Organic Compounds (Upstream Oil and Gas Sector)”, Government of Canada, December 16, 2023.

Canada Energy Regulator, “Canada’s Energy Future 2023 Energy Supply and Demand Projection to 2050”, pg 128, June 20 2023.

Katrin Sievert, Laura Cameron, Angela Carter, “Why the Cost of Carbon Capture and Storage Remains Persistently High”, International Institute for Sustainable Development, September 2023.

The Conference Board of Canada, “Economic Impacts From Cap and Trade on Oil and Gas”, Conference Board of Canada, March 2024, https://www.conferenceboard.ca/product/economic-impacts-from-cap-and-trade-on-oil-and-gas_2024/

Rigzone, Oil and Gas Conversion Calculator, https://www.rigzone.com/calculator/default.asp#calc

International Energy Agency (IEA), CCUS Projects Database.
http://www.iea.org/data-and-statistics/data-product/ccus-projects-database

Where insights meet impact

The Conference Board of Canada

conferenceboard.ca

SCHEDULE 6
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

THE CONFERENCE BOARD OF CANADA ECONOMIC IMPACT OF GREENHOUSE GAS EMISSIONS CAP AND METHANE 75 ON THE SASKATCHEWAN ECONOMY SLIDES DATED JULY 30, 2024

Economic Impact of Greenhouse Gas Emissions Cap and Methane 75 on the Saskatchewan Economy

Presentation to: Saskatchewan Economic Impact Assessment Tribunal

Tony Bonen, Executive Director, Economic Research

30 July 2024

The Conference Board of Canada

Project Overview and Context

- Saskatchewan's Lieutenant Governor in Councils asked the Economic Impact Assessment Tribunal to assess the economic costs of the Methane 75 regulations and upstream oil and gas cap-and-trade (the Cap) regulatory framework.
- Formally via the Order of Council (OC) 154/2024.
- In response to 2(a)-(d) in "Schedule A" of the OC, The Conference Board analyzed the economic impacts of the Cap and Methane 75 under two different scenarios:
  1. **Fixed Cap**
     - The GHG emissions cap stays fixed from 2030 to 2050
     - SK and all other jurisdictions achieve the 75 per cent methane emissions reduction from 2012 levels
  2. **Declining Cap**
     - The GHG emissions cap steadily falls from initial cap in 2030 to zero by 2050
     - SK achieved a 60 per cent reduction and all other jurisdictions achieve the 75 per cent methane emissions reduction from 2012 levels
       - SK is responsible for all additional emissions under the Cap

Key Findings

The Conference Board of Canada

Key Findings for the Canadian Economy

- In 2030, **Canadian oil and gas production** will be cut by one-quarter (~25 per cent) in 2030 versus the baseline forecast, a reduction of 2.4-2.6 million barrels of oil equivalent per day (boe/d).
- Beyond 2030, there is **significant policy uncertainty**, leading to unclear economic impacts.
- Under the **Fixed Cap scenario**, Canadian GDP will decline by an average of 1.2 per cent ($44 billion) per year from 2030 to 2050, with the impact decreasing overtime.
- Under the **Declining Cap scenario**, Canadian GDP will decline by an average of 1.8 per cent ($70 billion) per year from 2030 to 2050, with the impact remaining relatively constant over the 20 years.

Key Findings for the Saskatchewan Economy

- Average annual **SK oil and gas production** will decline by 17 per cent in the Fixed Cap scenario and by 43 per cent in the Declining Cap scenario compared to the baseline forecast.

- **Total investment** in the sector from 2030 to 2050 will decline by 24 per cent in the Fixed Cap scenario to 46 per cent in the Declining Cap scenario compared to the baseline forecast.

- **Average annual GDP** is forecast to be 3.6 per cent ($5.4 billion) lower than baseline in the Fixed Cap scenario, and 7.0 per cent ($10.9 billion) lower in the Declining Cap scenario from 2030 through 2050.

- **SK government revenue** falls by $1.1 (3.3 per cent) and 2.0 billion (6.3 per cent) in the Fixed and Declining Cap scenarios. Reduced royalties account for one-quarter to one-fifth per cent of this decline.

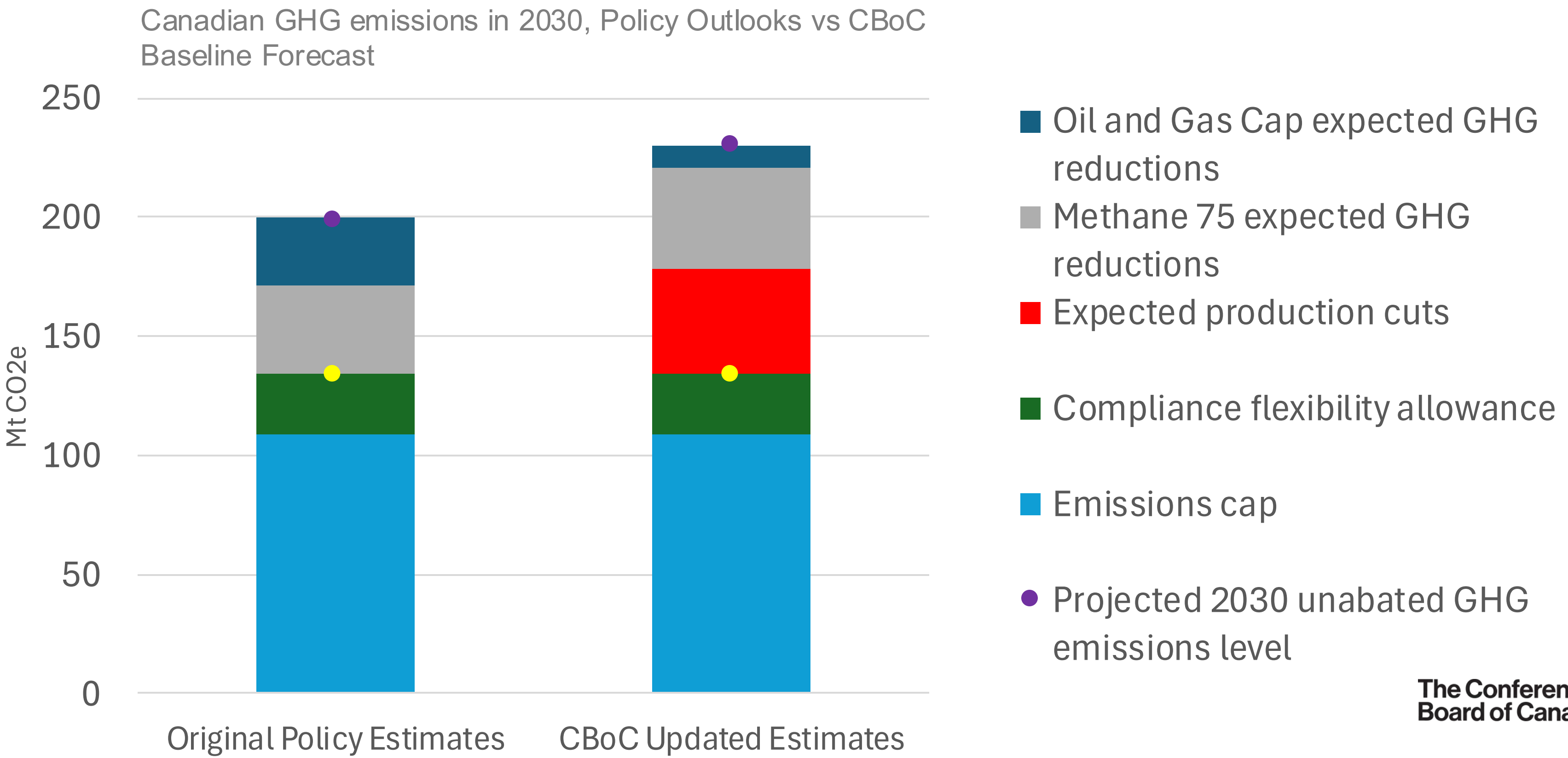
Direct Compliance Costs

- Cumulative direct compliance costs of the Cap and the related Methane 75 regulation in Saskatchewan to be between $13.8 to 15.6 billion from 2027 to 2050.
- However, these estimates do not account for the potential costs of major new carbon capture and direct air capture technologies that would need to be installed under the Declining Cap scenario.
- Long-term costs of CCUS, DAC other emerging technologies remain too uncertain to estimate with precision.

The Conference Board of Canada

Scenarios Overview

A higher starting and lower GHG intensity gains necessitate production cuts in 2030



Scenario elements determining level of production cuts

Scenario 1: Fixed Cap

a) Methane 75 is achieved in every jurisdiction

b) Investments decline before 2030 due to uncertainty

c) Oil and Gas Cap binds in 2030 and remains fixed through to 2050

d) Compliance flexible fixed at 25 Mt

e) GHG intensity declines by 2.0% p.a. between 2023 and 2045.

Scenario 2: Declining Cap

a) Methane 75 is achieved everywhere except in SK

b) Additional GHG emissions reduction burden falls entirely on SK

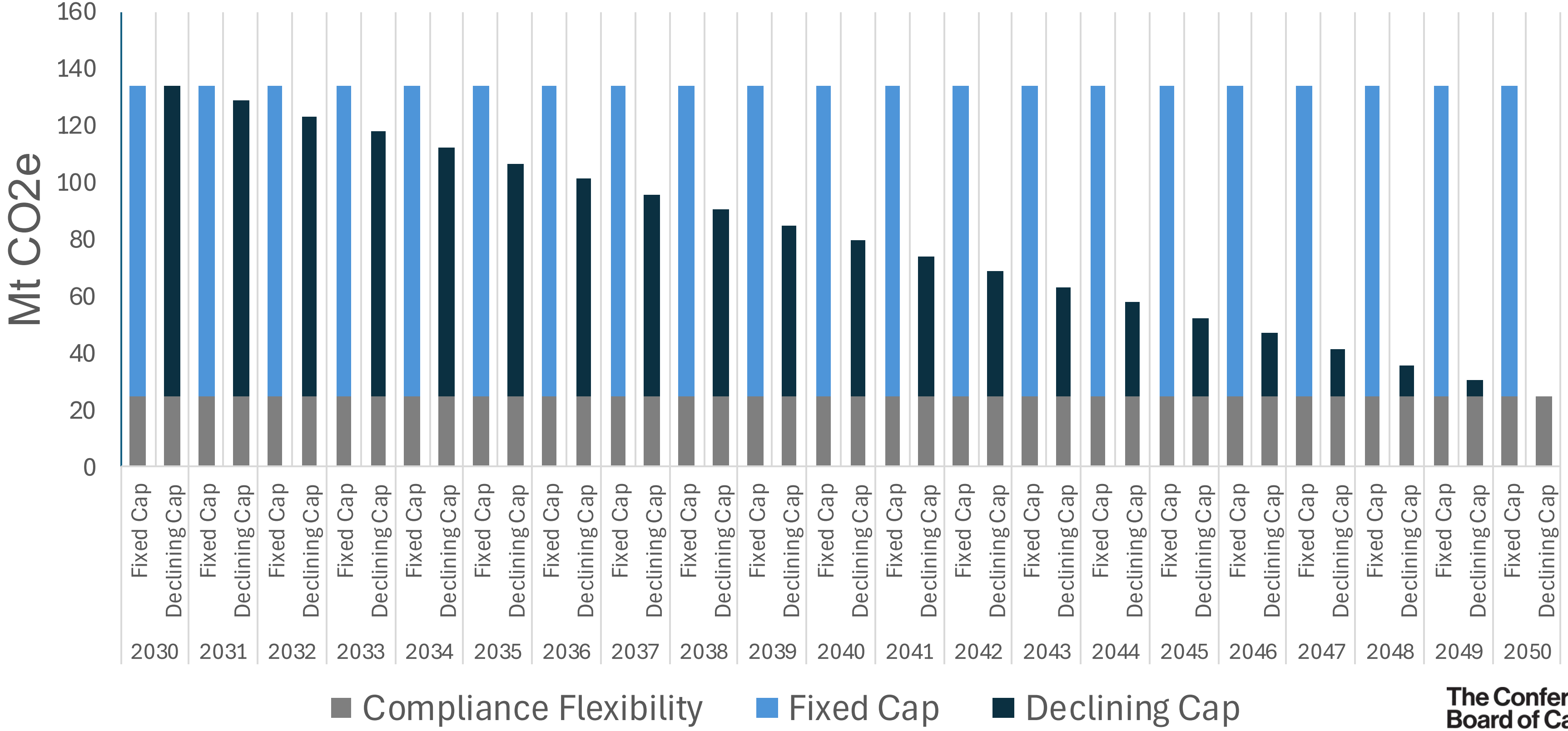
c) Investments decline before 2030 due to uncertainty

d) Oil and Gas Cap binds in 2030, and falls to zero by 2050

e) Compliance flexible fixed at 25 Mt

f) GHG intensity declines by 6.3% p.a. between 2030 and 2045 (5.1% decline p.a. from 2023)

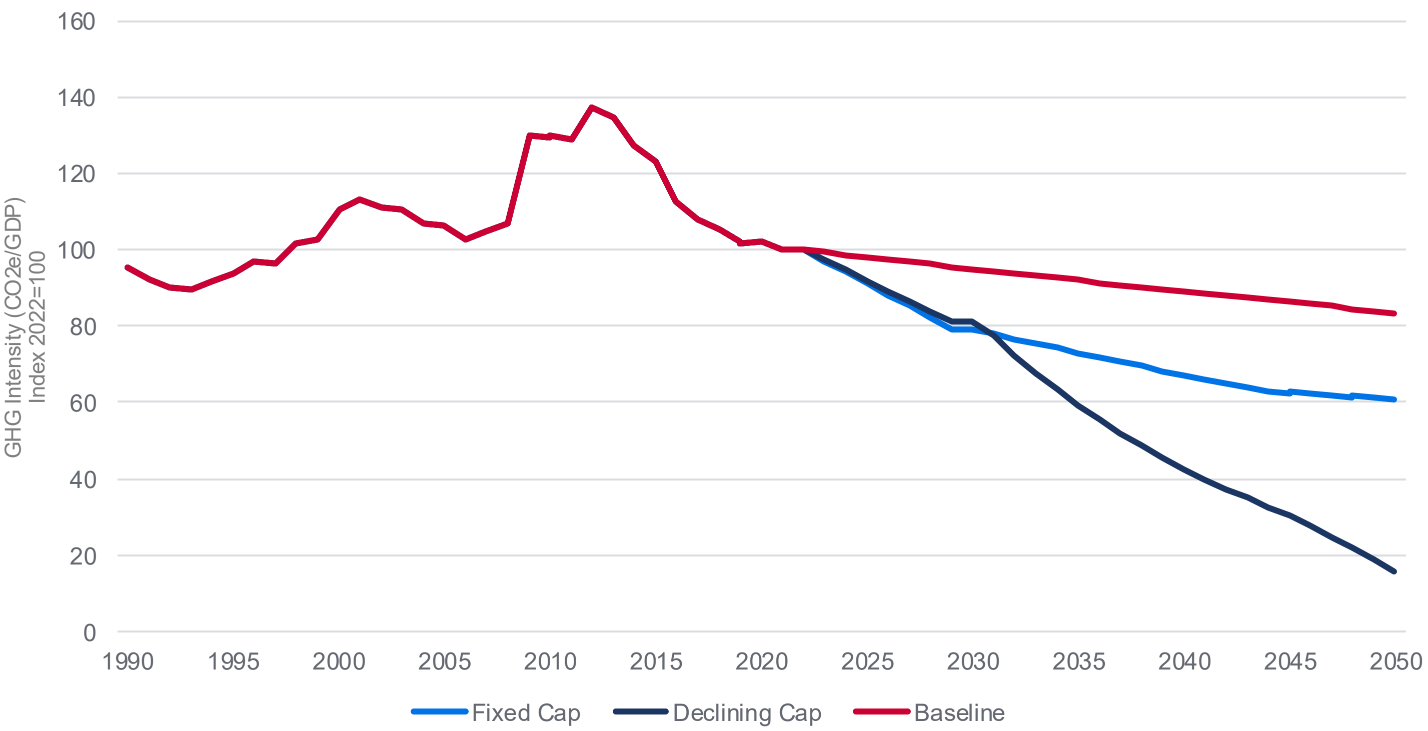
Total Oil and Gas Emissions Cap Assumptions



The Conference Board of Canada

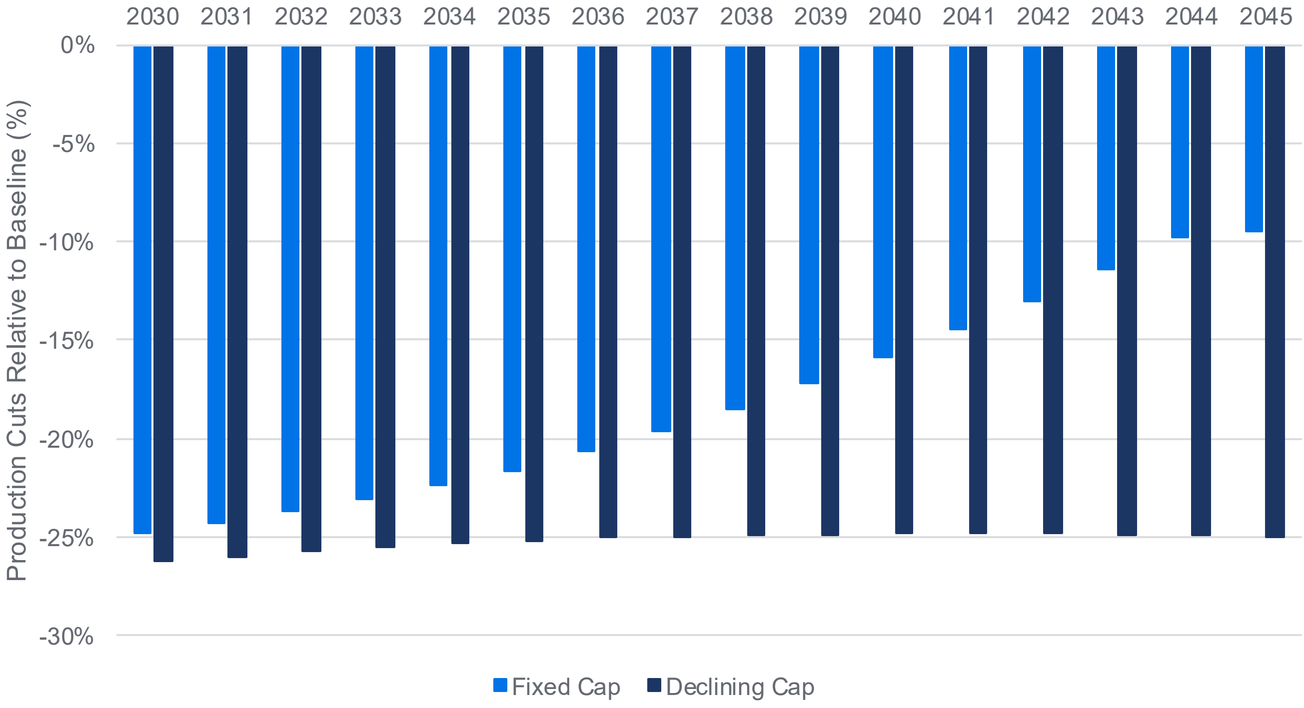
Given an emissions cap and GHG intensity level, exactly determines allowable oil and gas output

GHG Intensity (CO2e/GDP) in the oil and gas sector, Canada wide, historic and forecast



$$Y_t = \frac{Y_t}{E_t} \times \overline{E}_t$$

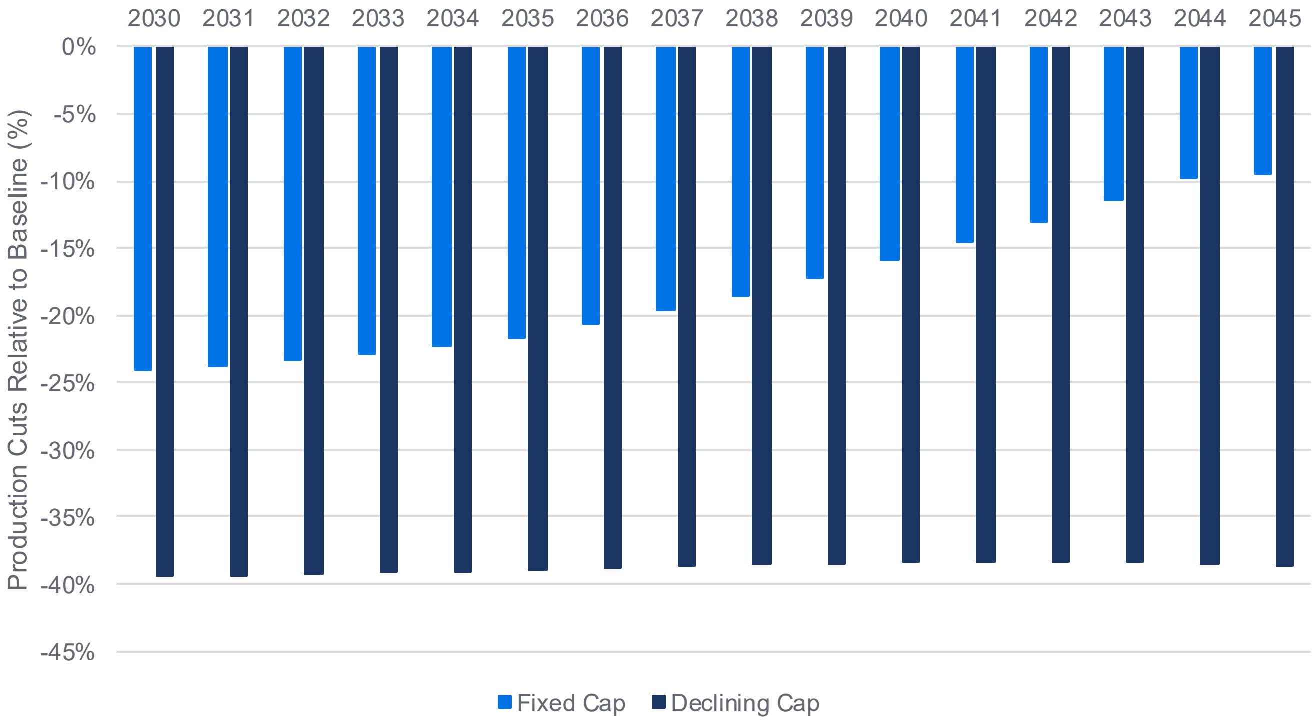
Canadian production shocks
(output cuts vs baseline)



Note: Demand shock applied through exports to Real Domestic Product: Oil and gas extraction (NAICS 211)

The Conference Board of Canada

Saskatchewan production shocks
(output cuts vs baseline)



Note: Demand shock applied through exports to Real Domestic Product: Oil and gas extraction & Coal mining (NAICS 211 + 2121)

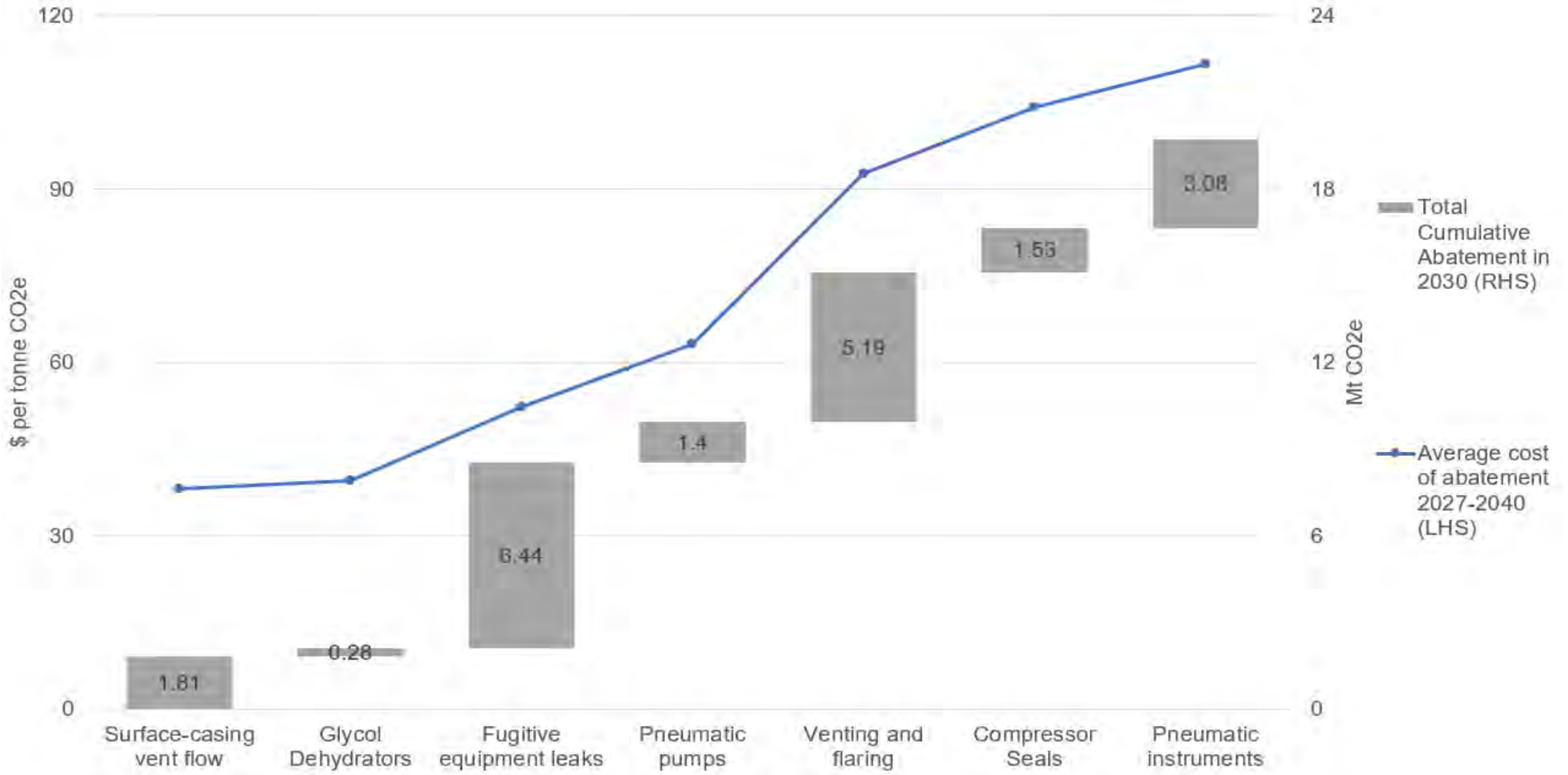
The Conference Board of Canada

Direct Compliance Costs

Compliance Costs Analysis

- High-level cost estimates using ECCC price-per-tonne of CO_2e abated under Methane 75
- Methane 75 compliance costs applied proportionately to Saskatchewan
- Investments in GHG intensity-reducing technologies assumed be offset by reduced investments in other areas
- The Cap compliance costs are therefore estimated to be the cost of purchasing carbon offsets under the regulatory framework (at $50/tonne)
- Major reductions in GHG intensity under the Declining Cap scenario are too uncertain. For example, current abatement costs approximately:
  - DAC costs ~$400-$450 / tonne
  - CCUS costs ~$28-$150 / tonne

Compliance costs of Methane 75 technologies



Direct Compliance Cost Estimates in SK

Policy	2027-2030	2031-2040	2041-2050
Methane 75			
Fixed Cap Scenario	$2,902	$4,658	$4,658
Declining Cap Scenario	$2,321	$3,727	$3,727
Oil and Gas Cap			
Fixed Cap Scenario			
Carbon credits expenditures	$162.5	$1,625	$1,625
Additional GHG abatement technologies	-	-	-
Declining Cap Scenario			
Carbon credits expenditures	$162.5	$1,625	$1,625
Additional GHG abatement technologies	-	unknown	unknown

Note: All values are in millions of constant 2023 dollars.

The Conference Board of Canada

Macroeconomic Implications of Methane 75 and the Cap

The Conference Board of Canada

Canada Level Results

- In the **Fixed Cap** scenario
  - **GDP is 1.2%** below trend, on average, from 2030 to 2050
  - **Employment** is down by **0.6%** versus baseline
  - **Investment** in the Oil and Gas sector falls by over **one-quarter** from baseline
  - **Federal government revenue** falls by **2%** versus baseline
- In the **Declining Cap** ("Net Zero") scenario
  - **GDP is 1.8% below** trend, on average, from 2030 to 2050
  - **Employment** is down by **0.9%** versus baseline
  - **Investment** in the Oil and Gas sector falls by over **one-third** from baseline
  - **Federal government revenue** falls by **3%** versus baseline

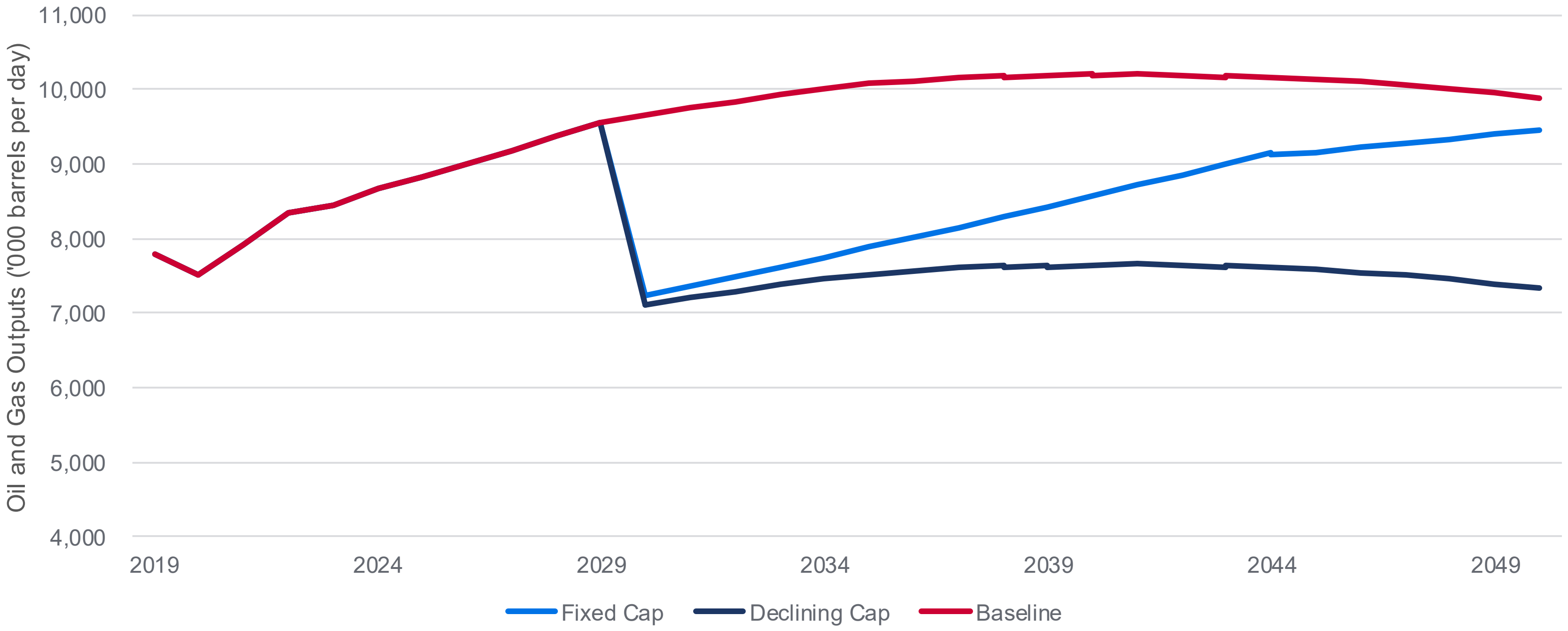
Canada: Annual and Cumulative Impacts to 2050

Scenario 1: Fixed Cap	Annual		Cumulative	
GDP (2023$b)	-$43.8	-1.2%	-$920	-1.1%
Investment (2023$b)	-$17.1	-2.4%	-$359	-2.3%
Oil and Gas Sector (2023$b)	-$10.8	-26.0%	-$228	-25.3%
Oil and Gas Sector Output (1000's boe/d)	-1,550.9	-15.5%	-32,567.9	-15.4%
Employment (person - year, 1000's)	-147.0	-0.6%	-3088	-0.6%
Federal Government revenue* (current $b)	-$14.1	-1.9%	-$295	-1.8%

Scenario 2: Declining Cap	Annual		Cumulative	
GDP (2023$b)	-$70.0	-1.8%	-$1,470	-1.8%
Investment (2023$b)	-$27.0	-3.6%	-$566	-3.6%
Oil and Gas Sector (2023$b)	-$14.2	-33.8%	-$299	-33.2%
Oil and Gas Sector Output (1000's boe/d)	-2,549.9	-25.4%	-53,547.5	-25.4%
Employment (person - year, 1000's)	-231	-0.9%	-4861	-0.9%
Federal Government revenue* (current $b)	-$22.4	-2.9%	-$471	-2.9%

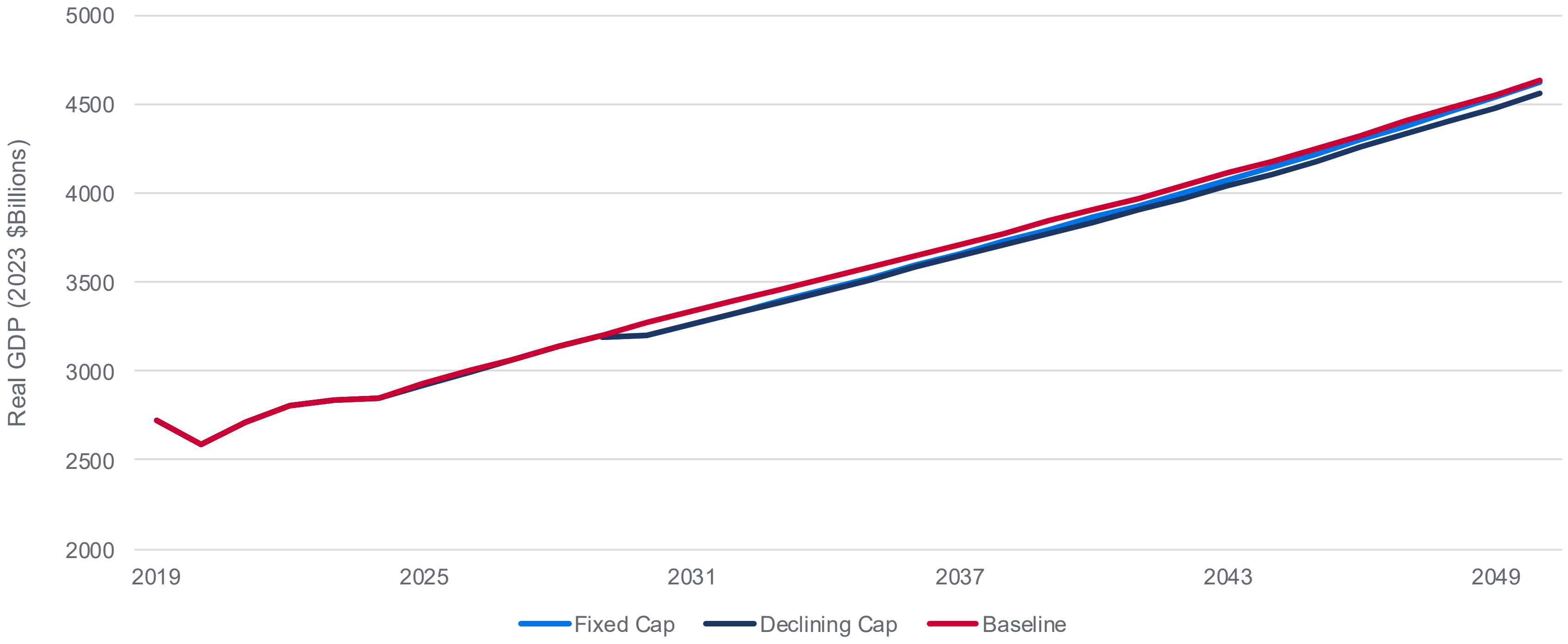
The Conference Board of Canada

Cumulative Canadian O&G output down by 15-25% over 20 years, 1.6 to 2.5M fewer boe/d per year



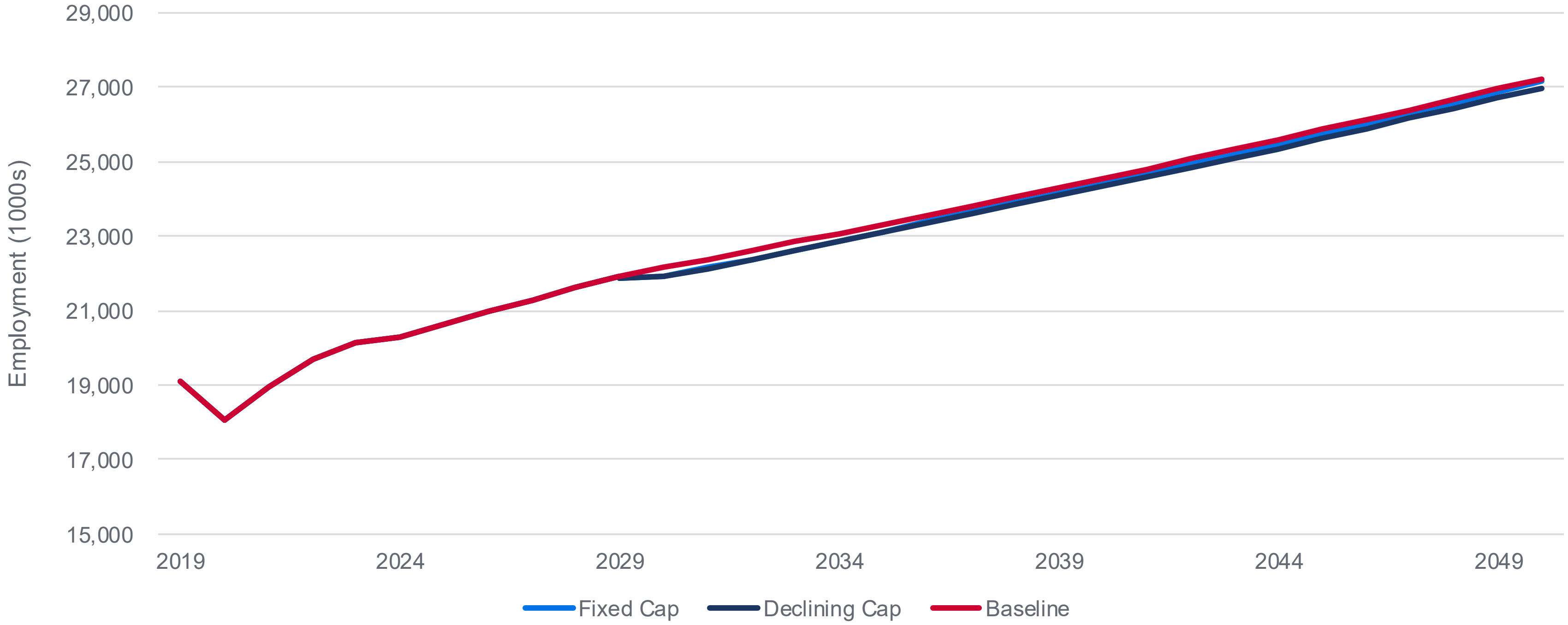
The Conference Board of Canada

GDP in Canada down by $920-1,470bn (1.2% - 1.8%) over 20 years



The Conference Board of Canada

Employment in Canada down by 147k – 231k (-0.6% - 0.9%) on average per year



The Conference Board of Canada

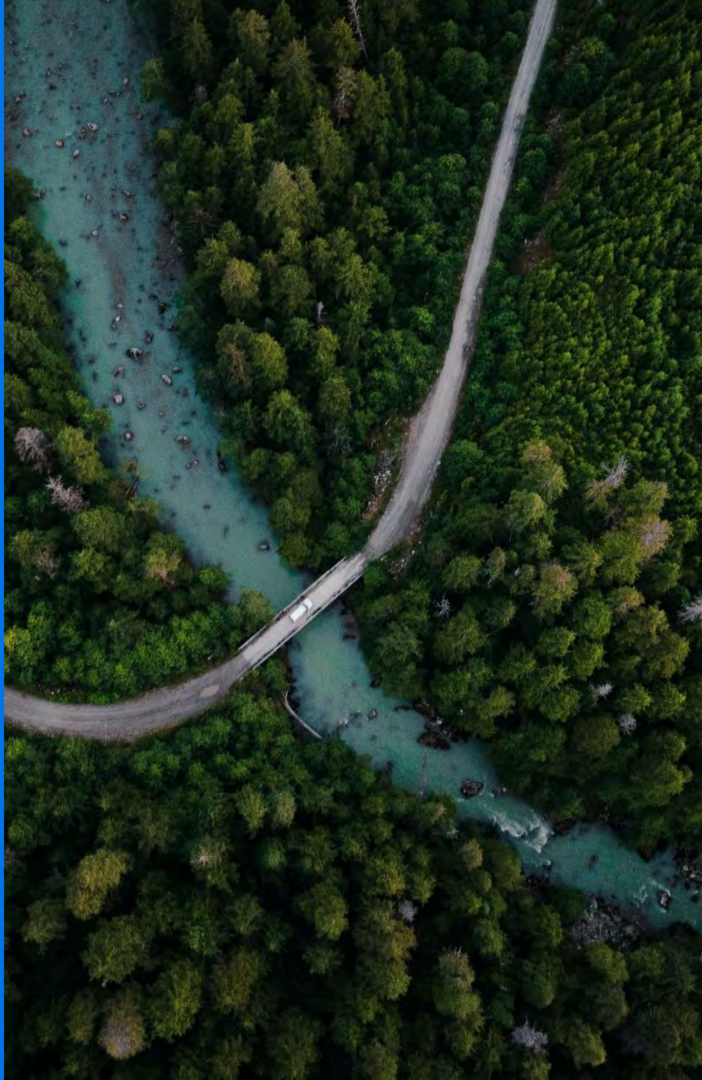
Saskatchewan Level Results

In the **Fixed Cap** scenario

- **GDP is 3.6%** below trend, on average, from 2030 to 2050
- **Employment** is down by **2.6%** versus baseline
- **Investment** in the Oil and Gas sector falls by over **one-quarter** from baseline
- **SK government revenue** falls by over $1bn/yr (**3.3%)** versus baseline, of which about 20% is from lower royalties

In the **Declining Cap** scenario

- **GDP is 7% below** trend, on average, from 2030 to 2050
- **Employment** is down by **3.9%** versus baseline
- **Output** in the Oil and Gas sector falls by **43**%
- **Investment** in the Oil and Gas sector falls by nearly **half (47%)** from baseline
- **SK government revenue** falls by nearly $2bn/yr (**6.3%)** versus baseline, of which about 25% is from lower royalties



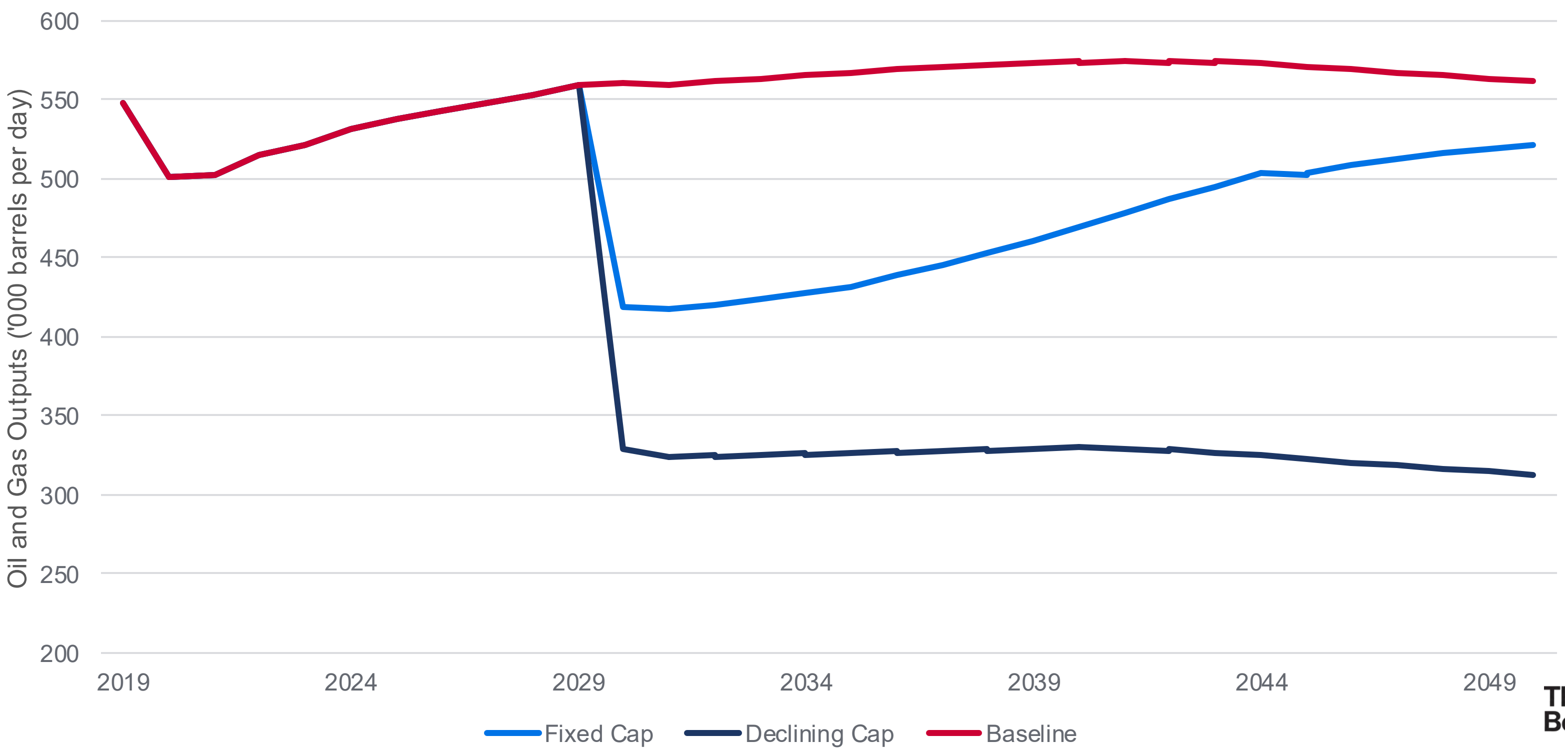
Saskatchewan: Annual and Cumulative Impacts to 2050

Scenario 1: Fixed Cap	Annual		Cumulative	
GDP (2023$b)	-$5.4	-3.6%	-$113.8	-3.5%
Investment (2023$b)	-$1.2	-4.9%	-$25.1	-4.7%
Oil and Gas Sector (2023$b)	-$1.0	-24.9%	-$21.4	-23.7%
Oil and Gas Sector Output (1000’s boe/d)	-99.0	-17.4%	-2,079.2	-17.4%
Employment (person – year, 1000’s)	-19	-2.6%	-405	-2.5%
Provincial Gov’t revenue* (current $b)	-$1.1	-3.3%	-$22.1	-3.3%
Provincial royalties (current $b)	-$0.2	-4.0%	-$3.2	-3.5%

Scenario 2: Declining Cap	Annual		Cumulative	
GDP (2023$b)	-$10.9	-7.0%	-$229.9	-7.0%
Investment (2023$b)	-$2.2	-8.8%	-$45.6	-8.6%
Oil and Gas Sector* (2023$b)	-$2.0	-47.2%	-$41.8	-46.2%
Oil and Gas Sector Output (1000’s boe/d)	-243.8	-42.9%	-5,118.8	-42.9%
Employment (person – year, 1000’s)	-29	-3.9%	-618	-3.9%
Provincial Gov’t revenue* (current$ b)	-$2.0	-6.3%	-$43.3	-6.7%
Provincial royalties (current $b)	-$0.5	-12.5%	-$11.4	-13.7%

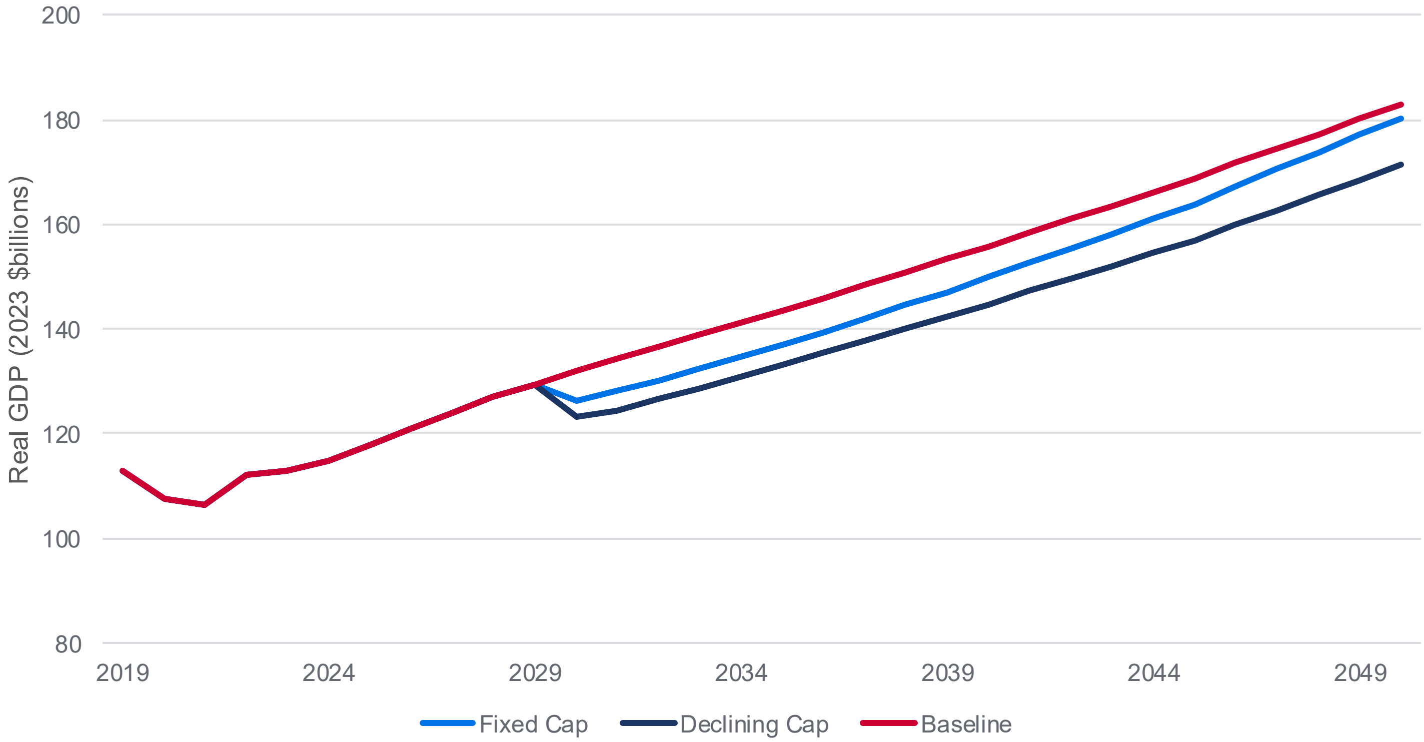
The Conference Board of Canada

Cumulative Saskatchewan O&G output down by 17-43% over 20 years, 99k to 244k fewer boe/d per year



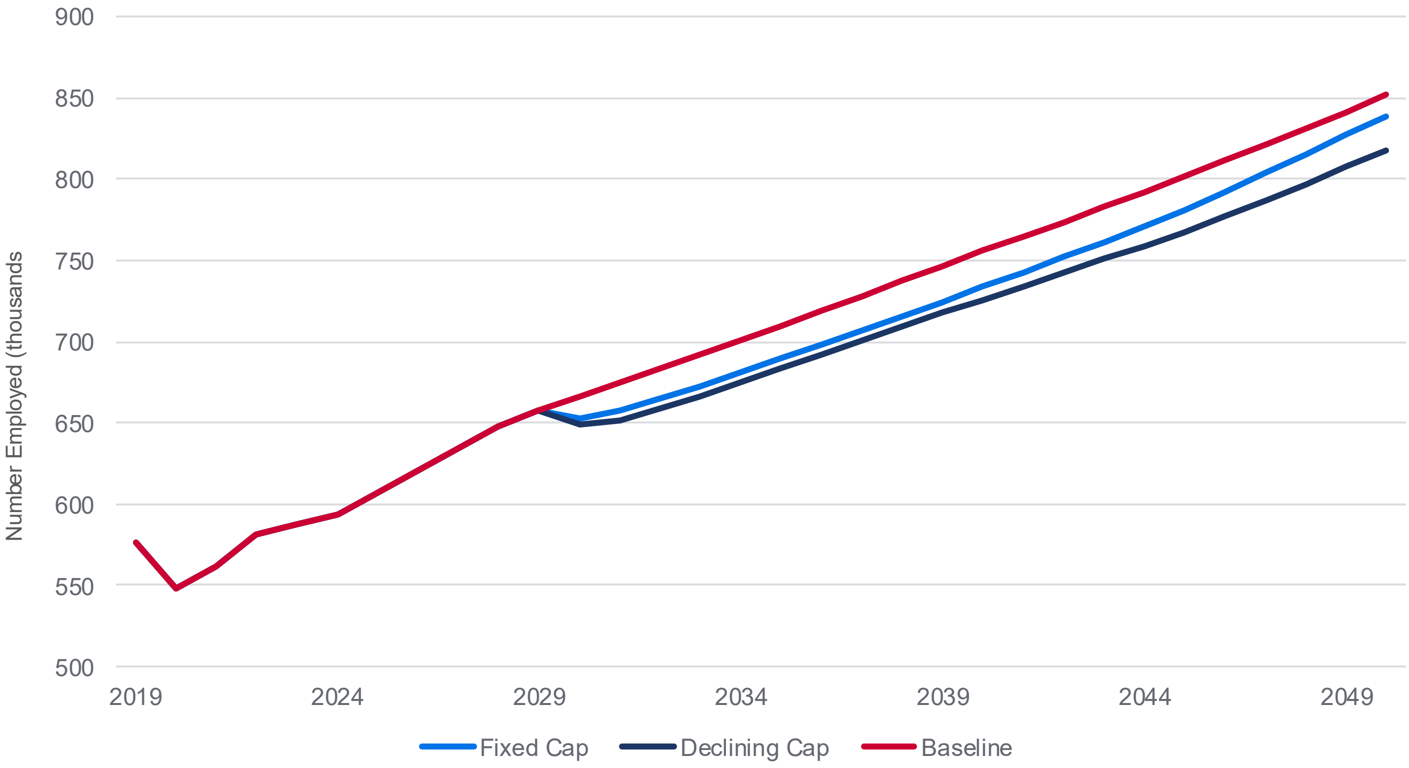
The Conference Board of Canada

GDP in Saskatchewan down by $114-230bn (3.5-7.0%) over 20 years



The Conference Board of Canada

Employment in Saskatchewan down by 19K - 29K (2.6% -3.9%) on average per year



The Conference Board of Canada

Conclusion and Implications

Conclusion

- Under the current Cap regulatory framework, production cuts in the oil and gas sector will be required in 2030 and beyond.
- Uncertainty on how the Cap will evolve beyond 2030 implies a wide range of possible scenarios.
- In the least impactful case (Fixed Cap) the effects on the sector will be large: A 15% cut in production nationally and a 17% cut in Saskatchewan on average per year.
  - In this case the 2050 net zero objective will not be met.
- To achieve the 2050 net zero objective in the Declining Cap scenario, emissions intensity must fall dramatically which will require massive investments in CCUS, DAC and other technologies must start today.
  - The scale and costs of these investments are not known
  - If the ambitious GHG intensity pathway is not met, then even more production cuts will be required.


Where insights
meet impact
The Conference
Board of Canada
conferenceboard.ca

About Us

The Conference Board of Canada is our country's foremost independent organization for applied research. We deliver unique, evidence-based insights to help Canada's leaders shape a more prosperous future.

Since 1954, our work has helped guide decision-makers to solve complex issues and navigate a better path for organizations and Canadian society.

Drawing on deep academic and practical experience, we provide unparalleled objectivity and rigour in our analysis. As researchers and economists with profound subject matter expertise, we bring applied insights to our key focus areas of Immigration, Health, Economics, Indigenous & Northern Communities, Human Resources & Leadership, Education & Skills, Sustainability, Inclusion, and Innovation.

Through sophisticated data modelling, best-in-class forecasting, and multi-method approaches, we deliver research that helps leaders take action. Our relationships are built on the trust in the validity and objectivity of our work. Leaders know they can turn to us to help solve Canada's most wicked problems.

Where insights meet impact

APPENDIX

The Modeling Process:

- **Compute the shock value:**
    1. Compute the CO2 equivalent emissions reductions resulting from technically achievable methane emissions reduction
    2. Compute the CO2 equivalent reduction resulting from other factors
    3. The remaining emissions reductions to achieve legal upper bound to be achieved through production cuts in the sector

- **National Model Shock:** Direct reduction in oil and gas sector exports that reduced overall output in line with the emissions policy target
- **Share out to SK:** Estimate reduction in O&G output in Saskatchewan specifically
- **Provincial model shock:** Use the share-out estimates to shock the SK model’s oil and gas sector
- **Fiscal Model Shock:** Use the provincial model shock to estimate impacts on tax revenues and royalties to the province.

Methodology

- The methodology will be similar to that undertaken for the Government of Alberta in Jan 2024
- The two scenarios will be modeled leveraging CBoC’s long-term macroeconomic models (national and provincial) and the SK public finances model
- These models extend to 2045, but key variable trends will be extrapolated to 2050.
- The scenarios will be compared against the CBoC’s baseline forecasts (i.e., shock minus control) to quantify the macroeconomic compliance costs of the regulations in Saskatchewan
- Both scenarios will be calibrated using 2024 NIR data.
- The baseline model does not include the regulations studied here or the prescriptive policies foreseen in the federal government’s Emissions Reduction Policy (ERP).

SCHEDULE 7
TO THE REPORT OF THE ECONOMIC IMPACT
ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS
CAP

SEPTEMBER 03, 2024

MINISTRY OF ENERGY AND RESOURCES SLIDES
DATED MAY, 2024

Federal Oil and Gas Emissions Cap Framework
Methane 75 Regulations

Energy and Resources
May 2024

saskatchewan.ca

Saskatchewan

Presentation Overview

- Part 1: Overview of Saskatchewan's Oil and Gas Sector
- Part 2: Overview of Saskatchewan's Oil and Gas Emissions
- Part 3: Draft Regulations - Methane 75
- Part 4: Draft Regulatory Framework – Oil and Gas Emissions Cap

Overview: Saskatchewan’s Oil and Gas Sector

- Saskatchewan is Canada’s second largest oil producer and is the 5^{th} largest on-shore oil producer in North America;

- In 2023:
  - Saskatchewan produced 454,000 barrels of oil per day;
  - Canada produced 4.9 million barrels of oil per day;
  - Saskatchewan produced 376 million cubic feet of natural gas per day – 75% was produced in association with oil;
  - Canada produced over 18 billion cubic feet of natural gas per day.

Overview: Saskatchewan’s Oil and Gas Sector

- Saskatchewan’s oil production (2023) occurs in 4 regions of the province:
    - Estevan/Weyburn – 135,000 bpd – mix of light and medium oil;
    - Swift Current – 42,000 bpd – primarily medium oil;
    - Kindersley – 88,000 bpd– mix of heavy and light oil;
    - Lloydminster – 189,000 bpd – primarily heavy oil.
- Saskatchewan produces oil using several recovery methods:
    - Conventional production – 151,000 bpd;
    - Cold Heavy Oil Production with Sand (CHOPS) – 42,000 bpd;
    - Steam Assisted Gravity Drainage (SAGD) – 155,000 bpd (22 active projects);
    - Carbon dioxide (CO_2) enhanced oil recovery (EOR) – 22,000 bpd; and
    - Other (Waterflood, Polymer EOR, etc.) – 84,000 bpd

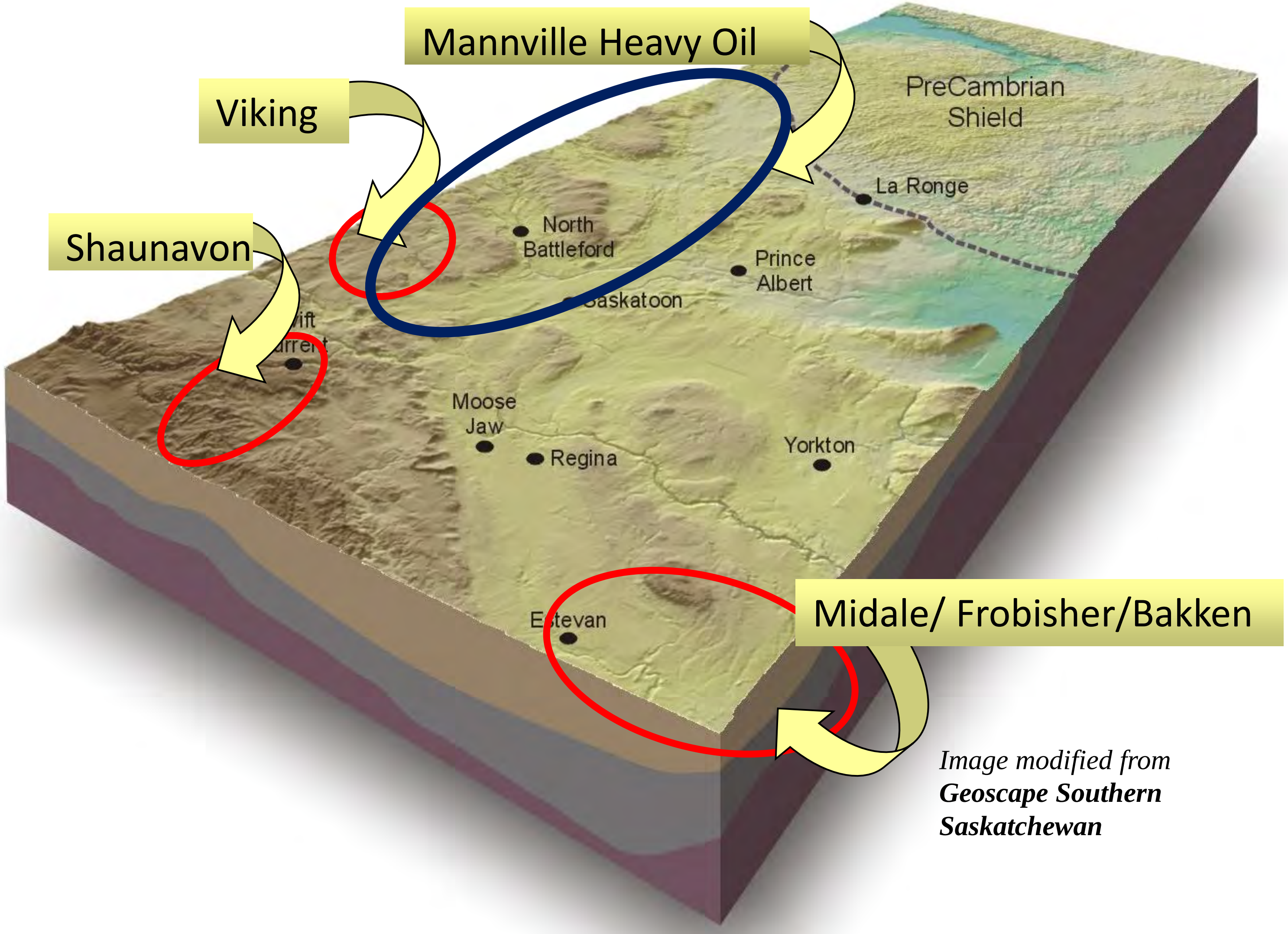
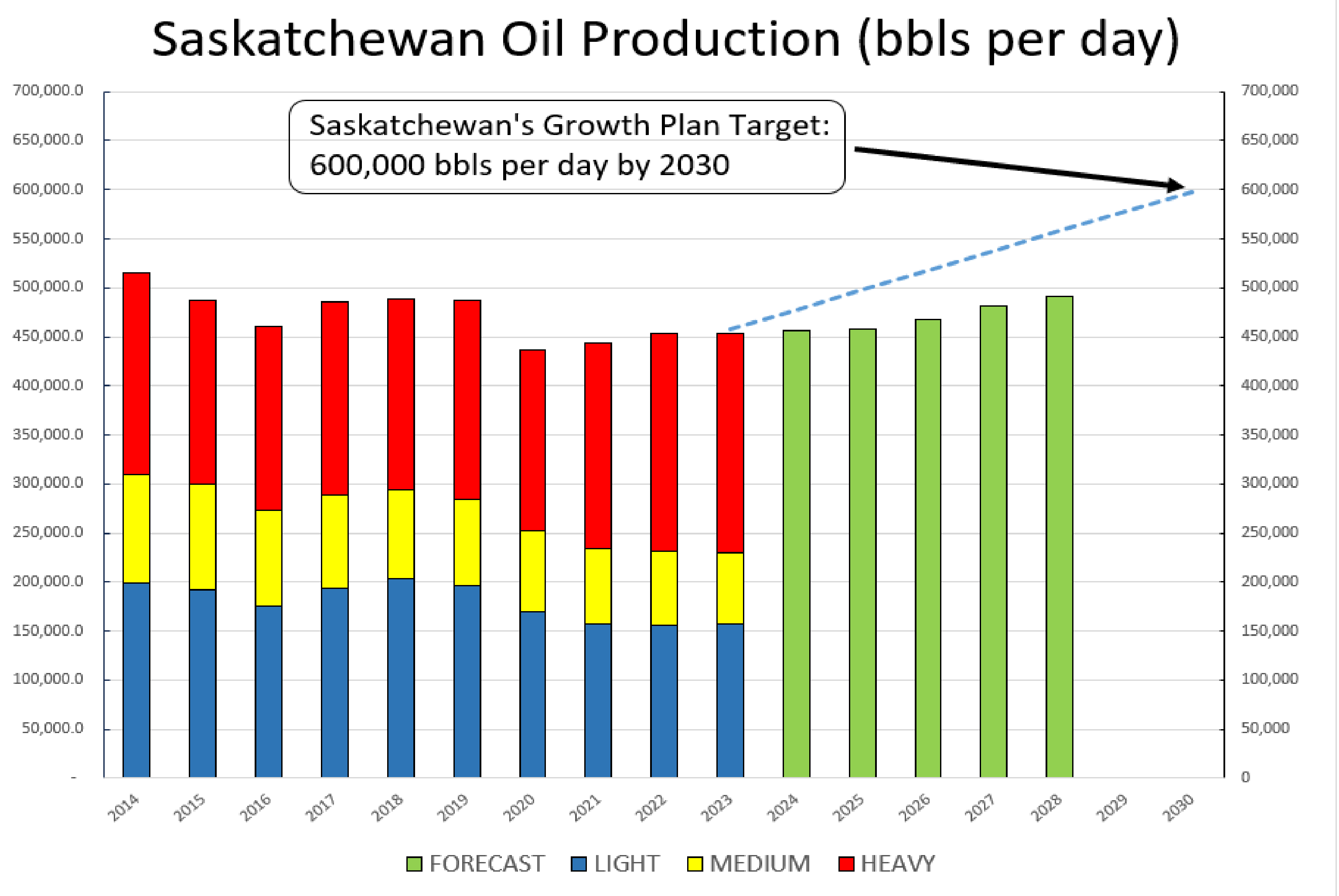


Image modified from
Geoscape Southern Saskatchewan

Overview: Saskatchewan's Oil and Gas Sector

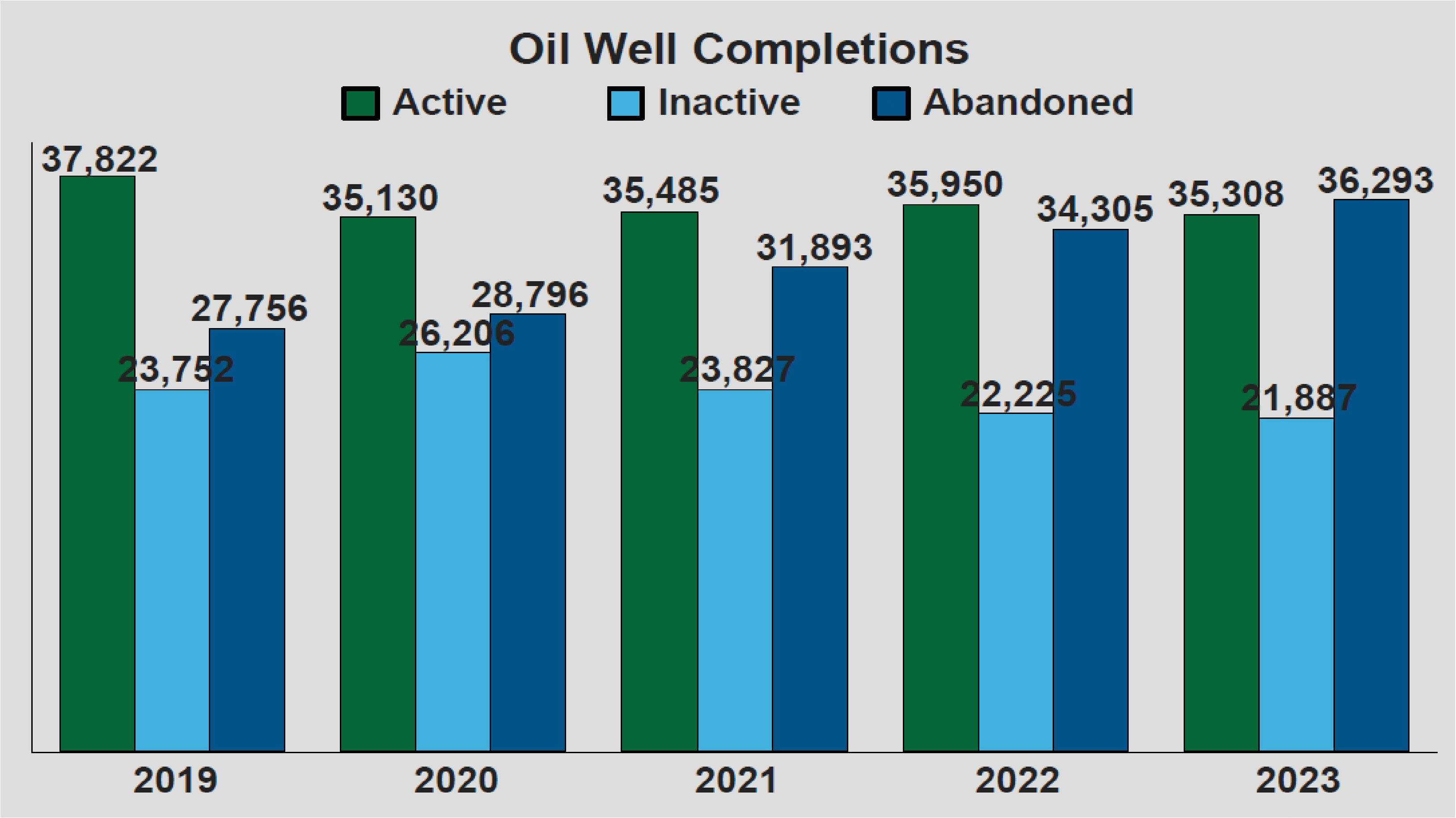
***Note:** forecast production does not account for the new multi-lateral well program, potential large-scale CO2 EOR projects, or other production innovations that may occur in the future.*



Overview: Saskatchewan’s Oil and Gas Sector

Top 10 Saskatchewan Oil Producers		
Rank	Well Operator	2023 Oil Production (bbls per day)
1	CENOVUS ENERGY INC.	113,479
2	WHITECAP RESOURCES INC.	62,483
3	CRESCENT POINT ENERGY CORP.	55,291
4	STRATHCONA RESOURCES LTD.	48,572
5	TEINE ENERGY LTD.	30,842
6	BAYTEX ENERGY LTD.	20,369
7	CANADIAN NATURAL RESOURCES LIMITED	15,425
8	IPC CANADA LTD.	13,989
9	SATURN OIL & GAS INC.	13,502
10	VERMILION ENERGY INC.	7,893

Overview: Production Infrastructure



Overview: Processing Infrastructure

- Saskatchewan has 2 oil upgrader facilities;
  - 1 in Lloydminster (Cenovus) and 1 in Regina (Federated Cooperatives Ltd.);
  - Process crude oil to be refined on site or transported via pipeline to a refinery.

- Saskatchewan has 2 oil refineries;
  - Federated Cooperatives Ltd. in Regina;
  - Gibson's Asphalt Plant in Moose Jaw.

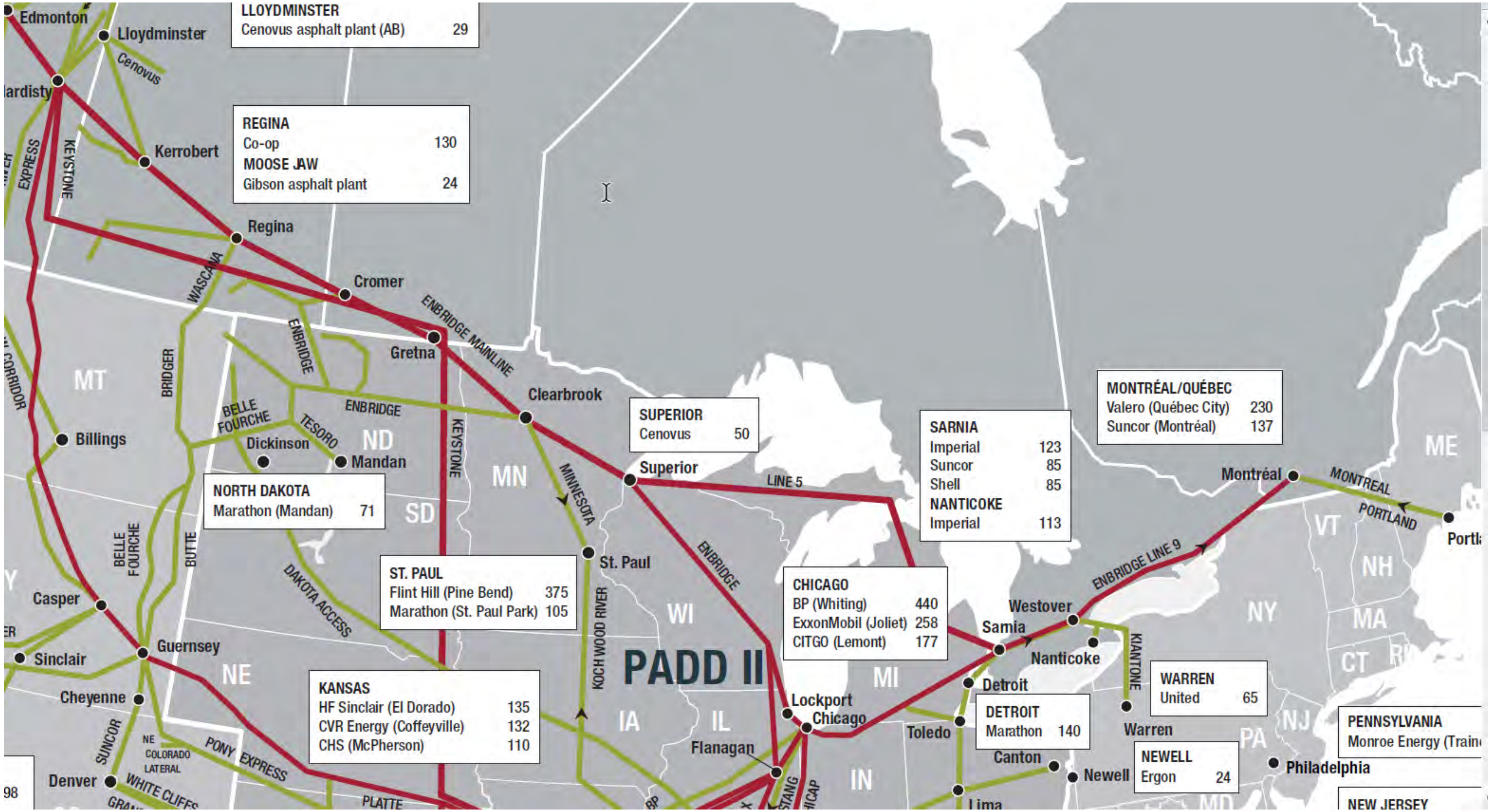
- Saskatchewan has 28 Gas Processing Plants;
  - Process natural gas into commercially salable products – take dedicated natural gas production and associated gas.

Overview: Transportation Infrastructure

- Dependent on regional pipelines to moves oil production to market:
  - Estevan Weyburn Area – Kingston Midstream Pipeline System(s);
  - Swift Current – Plains South Saskatchewan System;
  - Kindersley – InterPipeline and Secure Pipelines, Plain's Manito;
  - Lloydminster – Husky Midstream gathering system.

- All regional pipelines deliver oil to the Enbridge Mainline System:
  - 70% of all Saskatchewan oil is exported to the US via the Enbridge Mainline;
  - Some crude by rail to the US, but minimal – only Strathcona consistently;
  - Most remaining oil not exported feeds refineries.

Overview: Transportation Infrastructure



Saskatchewan

Overview: Economic Impact of Oil and Gas

- In 2023:
  - Saskatchewan's oil and gas sector generated over $1.0 Billion in revenue for the province;
  - $3.0 Billion in Capital Investment in Oil and Gas vs. $17.1 Billion Capital Investment across the Economy;
  - Saskatchewan's oil and gas sector employed an estimated 26,000 people;
  - The value of Saskatchewan's oil production was $13.1 Billion;
  - The value of oil exports from Saskatchewan was $11.6 Billion.

Saskatchewan's Oil and Gas Sector: Key Points

1. SK's oil production is not co-located with a large natural gas industry, resulting in lower densities of gas conservation infrastructure, and creating challenging economics for further reductions in methane emissions.

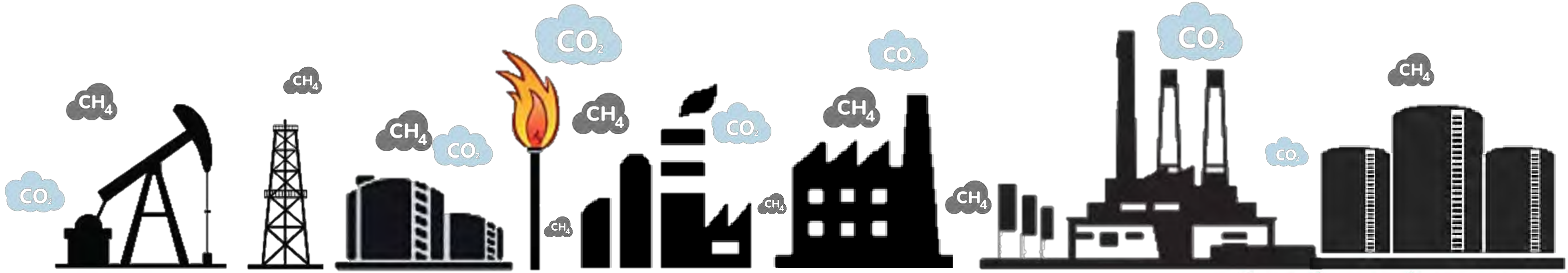
2. SK's oil industry is characterized by many facilities (e.g. wells, gas plants, SAGD) across a large geographic area. SK's industry does not have significant point source emissions (e.g. Alberta oil sands).

3. SK's oil industry is a significant contributor to the provincial economy and to government revenues.

Overview: Oil and Gas Sector Emissions

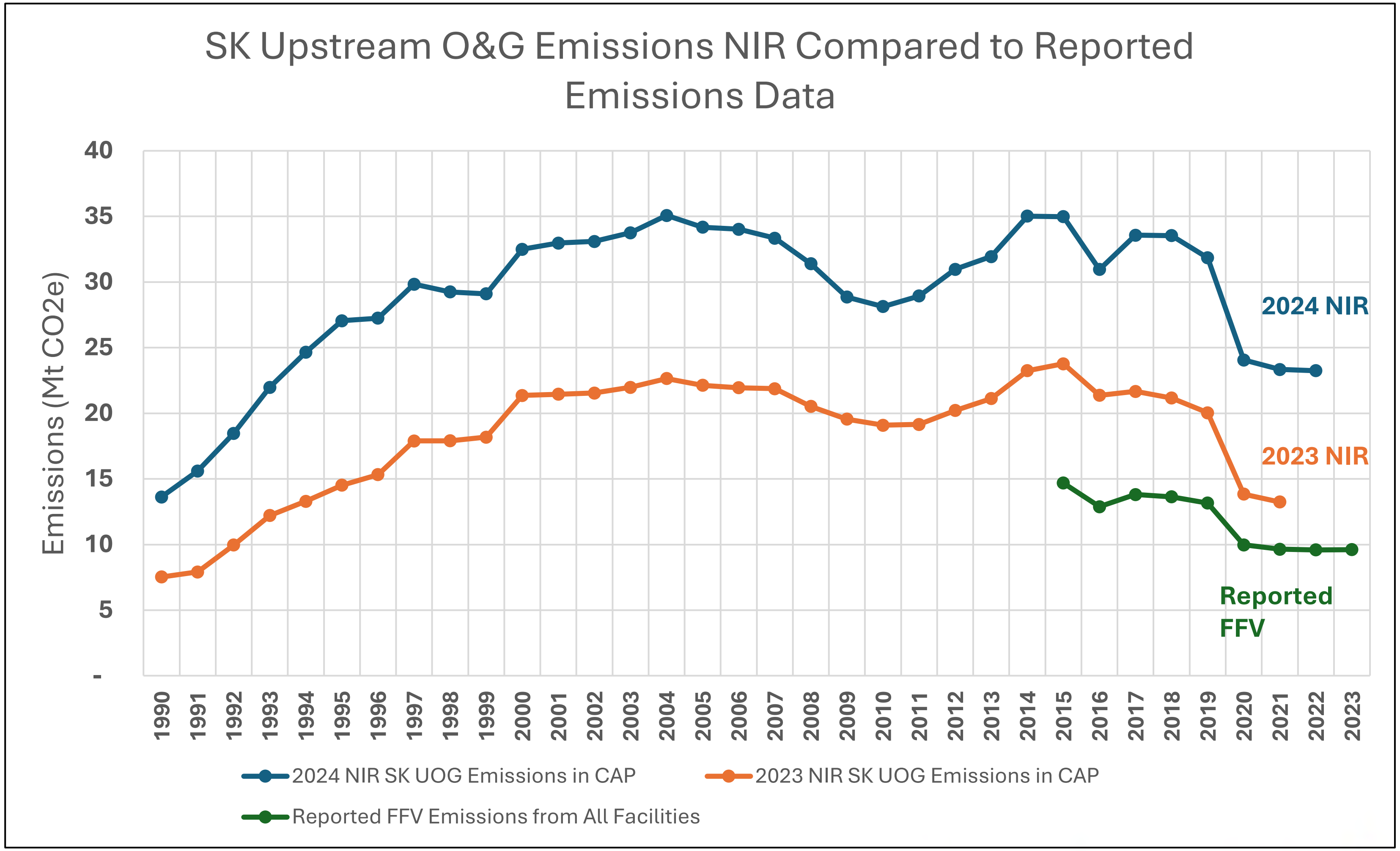
- There are several sources of Scope 1 emissions in oil and gas production:
  - **Fuel** – (CO_2) – Gas that is combusted and the released energy is used in operations.
  - **Flare** – (CO_2) – Waste gas that is combusted in a flare or incinerator.
  - **Vent** – (CH_4) – Intentional release of non-combusted gas to atmosphere.
  - **Fugitive** – (CH_4) – Unintentional release of non-combusted gas to atmosphere.

- The oil and gas sector is the largest power user in the province (Scope 2).



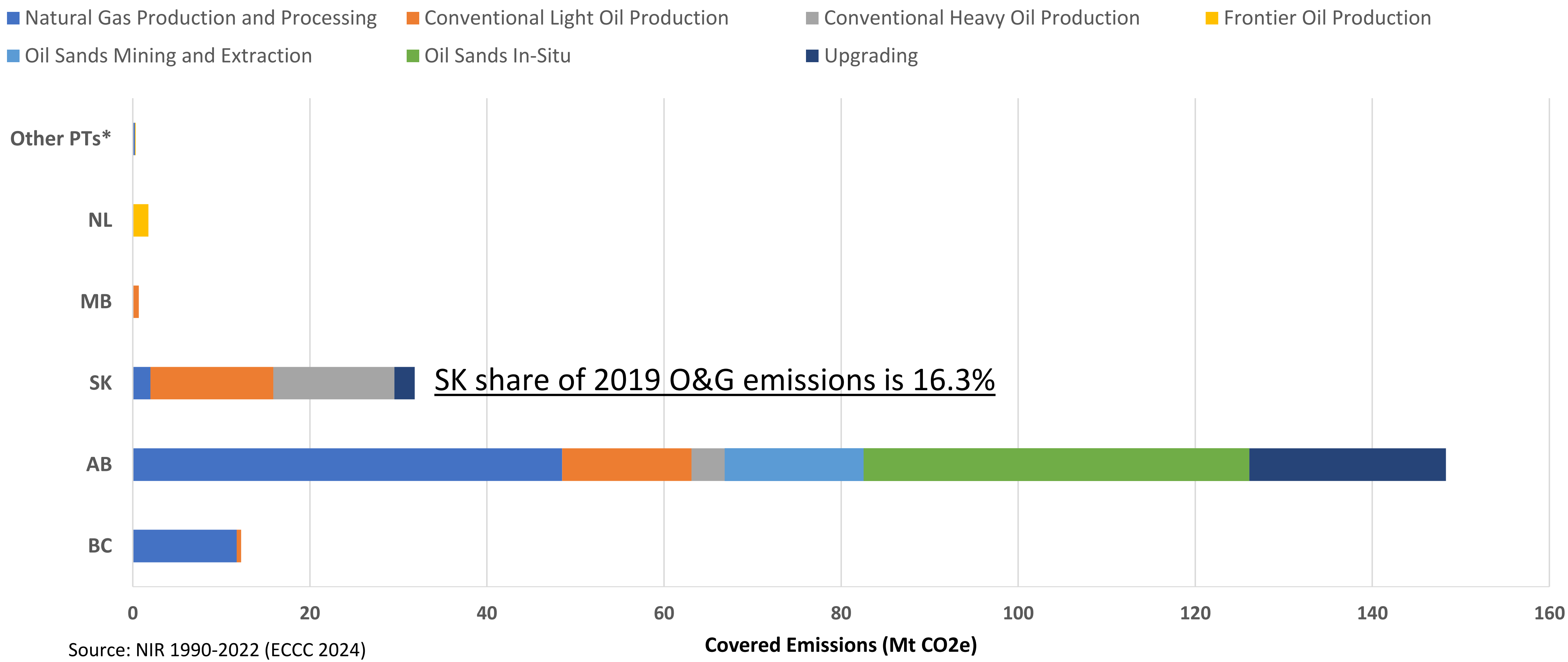
Overview: Oil and Gas Sector Emissions

- Data challenges with emissions are significant;
- Two key sources:
    - Federal NIR; and
    - Petrinex.
- NIR 2024 combines a bottom-up with a top-down approach (SK expressed concerns);
- Fuel, Flare, and Vent volumes are reported by industry in Petrinex;
- Industry best-practice for measurement under Directive-17.



Saskatchewan

Canadian Oil and Gas Emissions: 2019



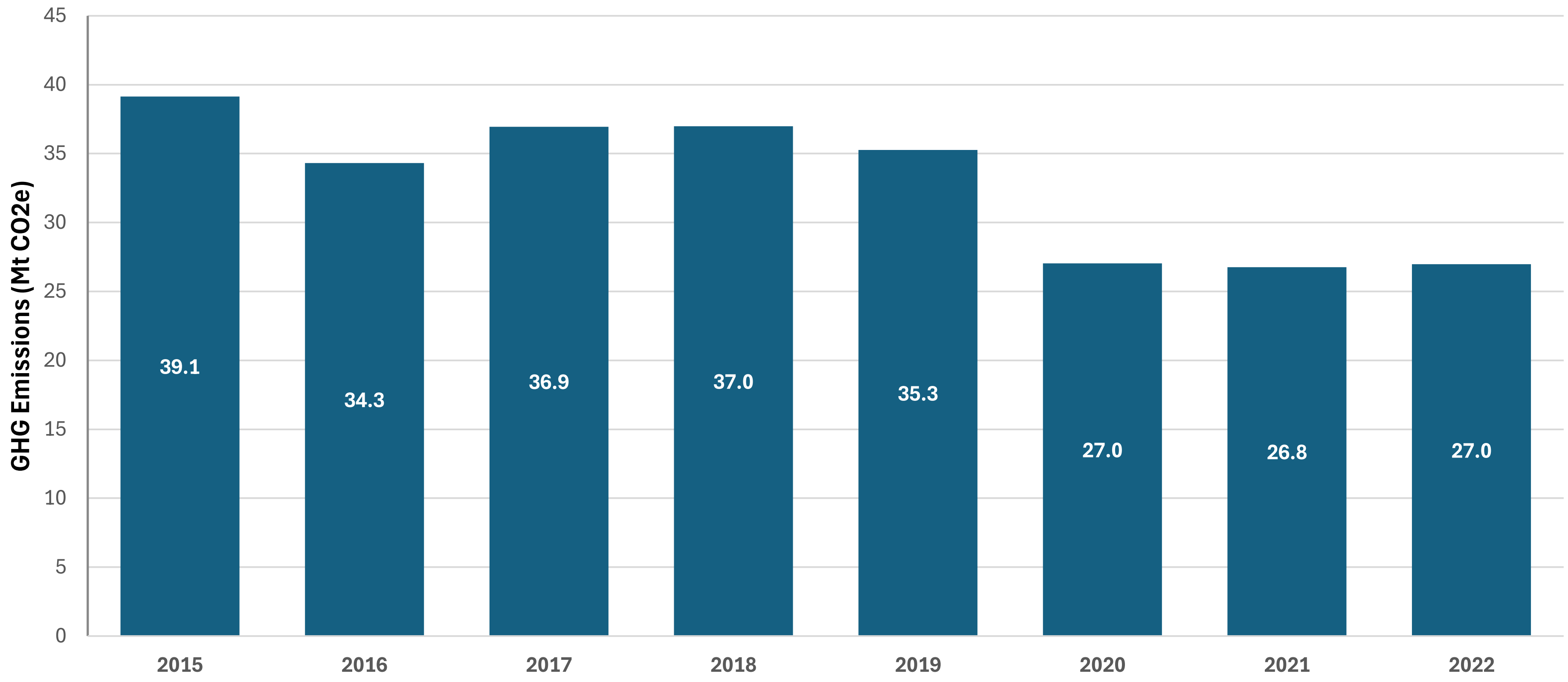
Source: NIR 1990-2022 (ECCC 2024)

* Other PTs include: ON, NB, QC, NT, YT

Note: Saskatchewan has expressed concerns with the 2024 NIR approach, particularly on measurement of fugitive emissions.

Saskatchewan Oil and Gas Emissions Trends

- Saskatchewan's oil and gas sector has reduced emissions by 31% from 2015-2022 (12.2 $MtCO_2e$), and by **23% from 2019-2022** (8.3 Mt CO2e).

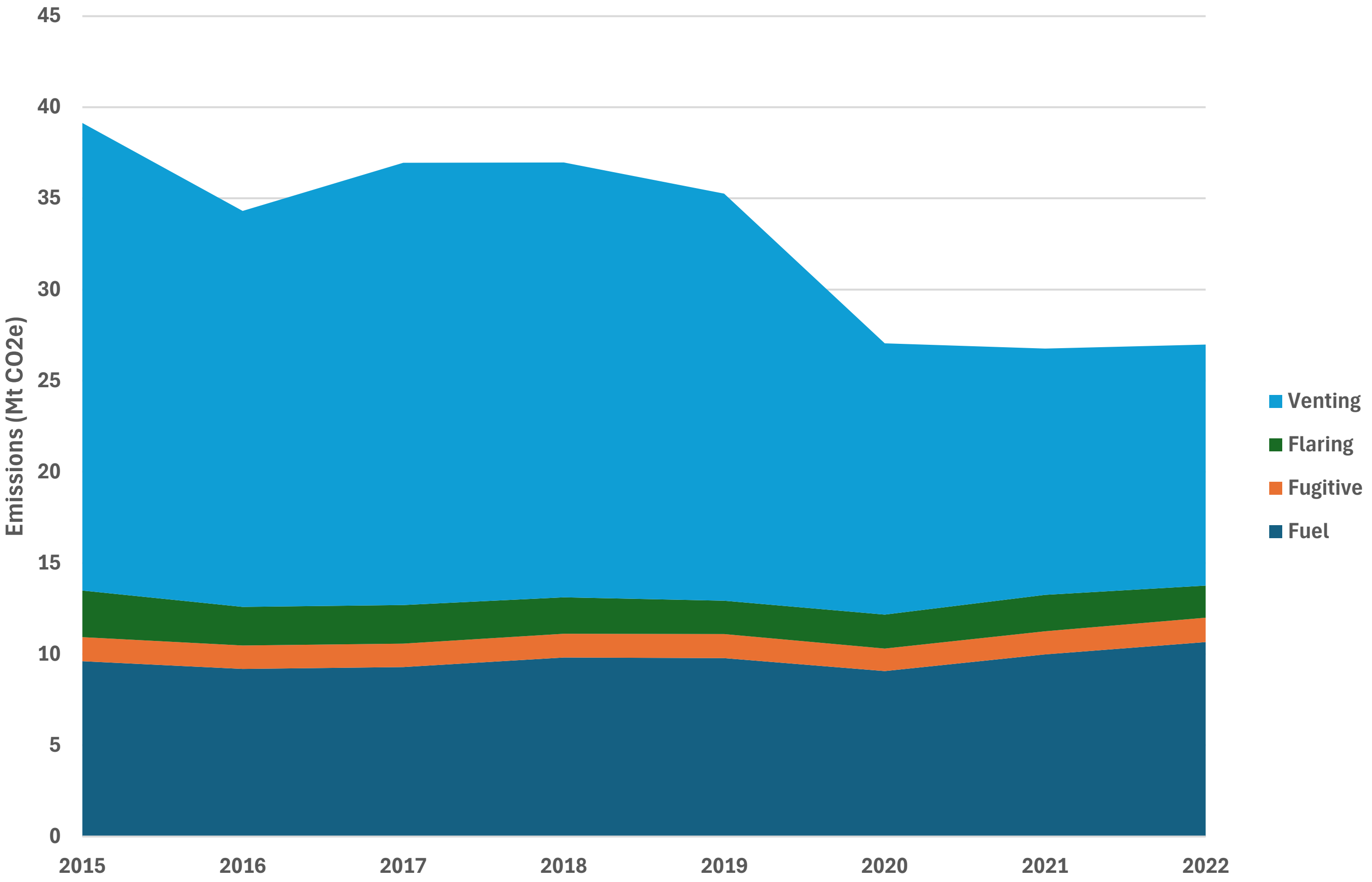


Saskatchewan's Oil and Gas Sector Emissions from 2015 to 2022

Source: National Inventory Report 2024.

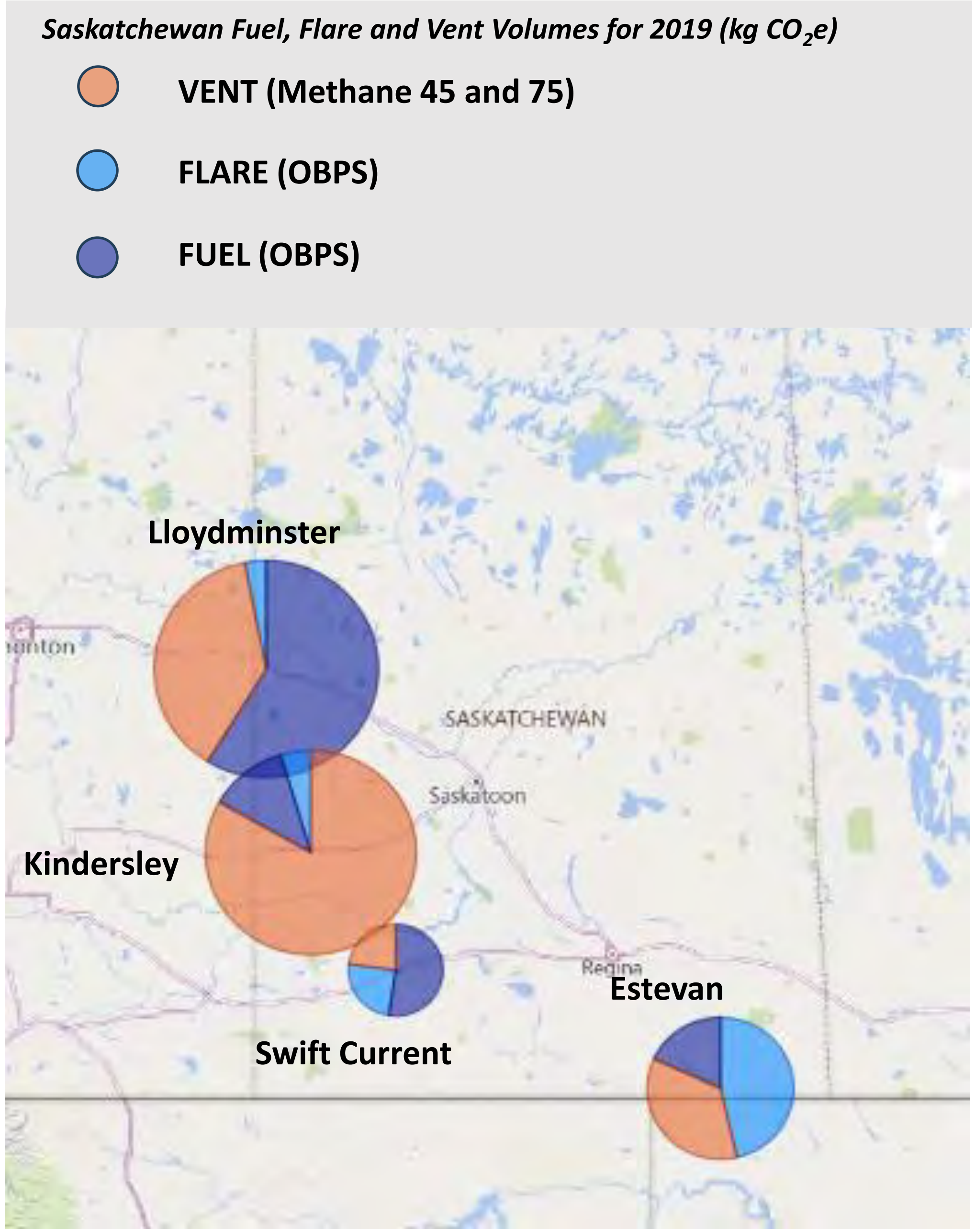
Saskatchewan Oil and Gas Emissions Trends by Type

- The majority of O&G GHG reductions have come from reduced venting of methane.
- Additional reductions via gas gathering are becoming more expensive (infrastructure constraints).
- Other options include combustion (flaring) or stationary fuel combustion on-site.
- Some fuel emissions can be reduced by CCUS and electrification or efficiency gains.
- Differences amongst regions exist.



Source: NIR 1990-2022 (ECCC 2024)

Saskatchewan's O&G Emissions Trend from 2015-2022.

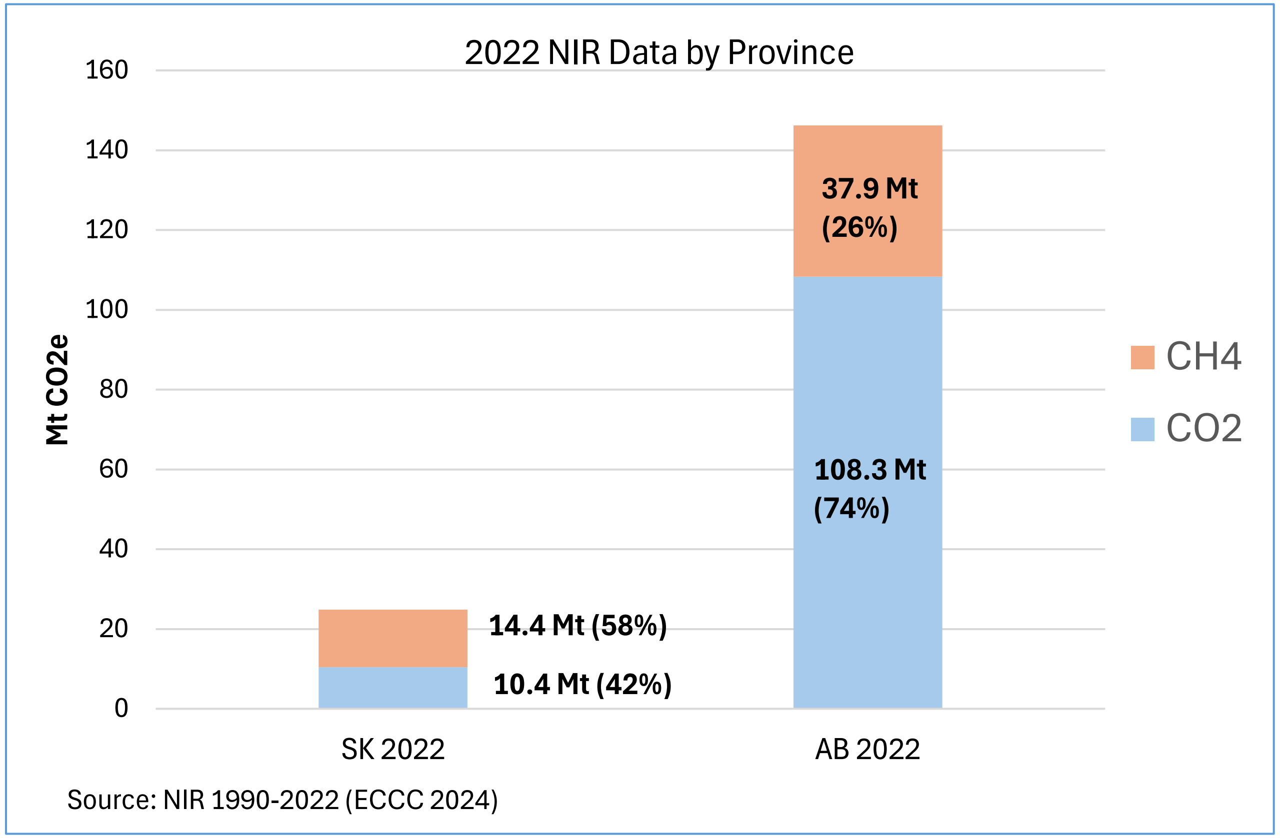


Regional Differences – Within Saskatchewan

- Conventional Heavy Oil - Lloydminster
  - Cold heavy oil production with sand (CHOPS)
    - 7-10 years of production/well
    - Methane emissions with some fuel use emissions (limited methane collection infrastructure)
  - Steam Assisted Gravity Drainage (SAGD)
    - Fuel emissions (natural gas to generate steam)
    - Longer productive life vs CHOPS
- Conventional Light Oil
  - Kindersley Viking (very limited methane gathering infrastructure)
  - Estevan Bakken (some methane gathering infrastructure):
    - Primary production
    - 3-5 years of significant productive life
  - Swift Current, Estevan
    - Primary production, waterflood, CO_2-EOR
    - 10+ years of significant productive life

Regional Differences – Across Jurisdictions

- British Columbia
  - Primarily natural gas production
  - Some conventional oil production
- Alberta
  - Oilsands
  - Significant natural gas production
  - Conventional oil production
  - Oil production and gas production areas are co-located
- Saskatchewan
  - Primarily conventional oil production
  - Some natural gas production
    - Mostly natural gas produced in association with oil production
  - Oil production and gas production areas are not co-located.



Comparison of Upstream SK & AB CO2 & CH4 Emissions from 2024 NIR Data

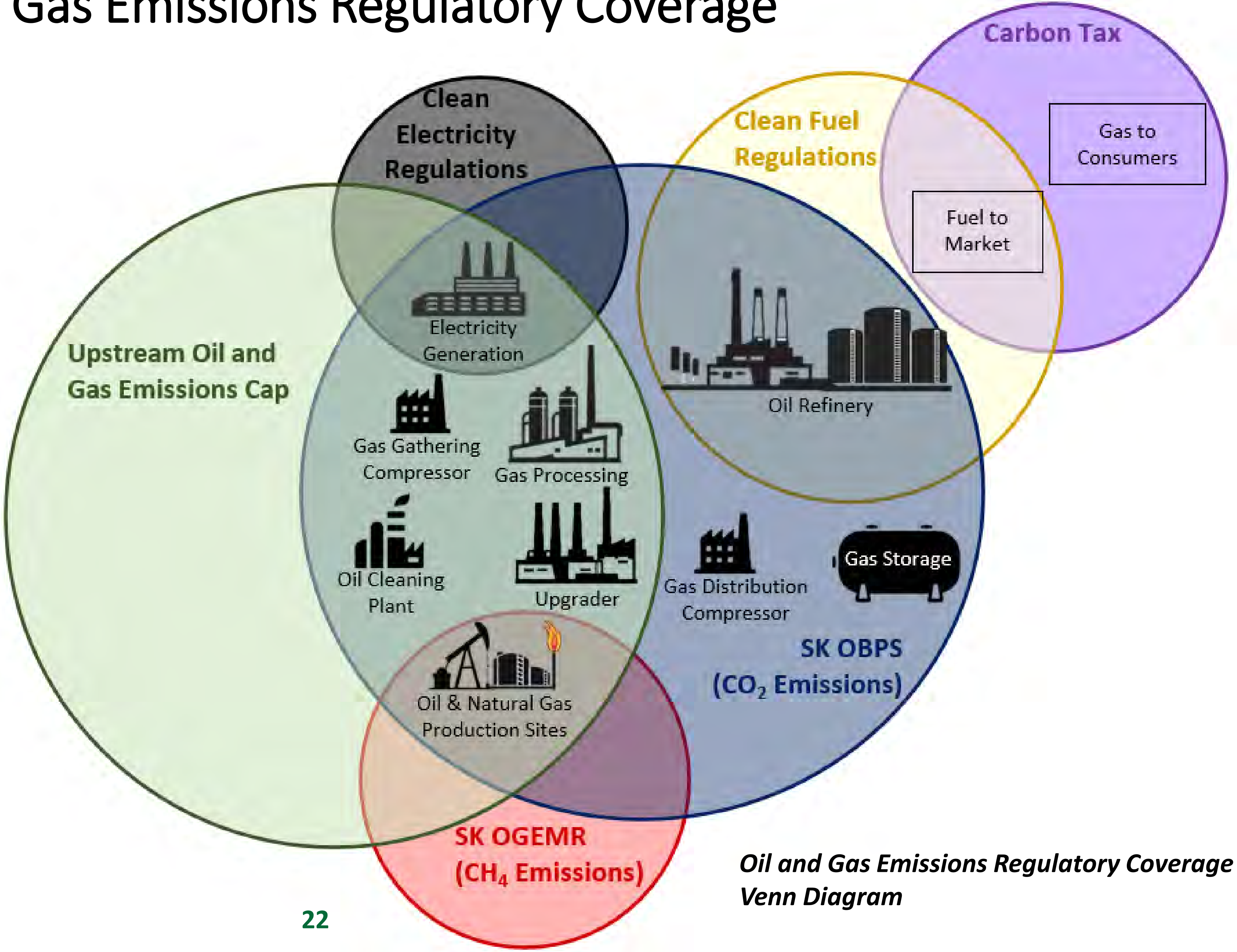
- Comparing Upstream SK & AB Oil and Gas Emissions profiles by gas, methane (CH_4) has a much higher contribution in SK.

Overview: SK Oil and Gas Sector Emissions

- Saskatchewan has full regulatory coverage of oil and gas sector emissions, as well as supporting policies and programs.
  - Provincial Output Based Performance Standard (OBPS): Intensity-based and covers majority of CO_2 emissions from oil and gas sector.
    - Combusted fuel emissions (e.g. SAGD, on-site propane/diesel) and flaring (e.g. CH_4 to CO_2);
    - Supported by the Saskatchewan Technology Fund.
  - Oil and Gas Emissions Management Regulations (OGEMR): Uses results-based approach to mandate a 45% reduction in GHG emissions from upstream oil and gas by 2025 relative to 2015 levels.
    - Flaring and venting emissions in upstream oil and gas sector;
    - Supported by the Methane Action Plan (e.g. SPII, OGPII, and OIIP).

Oil and Gas Emissions Regulatory Coverage

- The overall coverage and regulatory stacking on the energy sector is complex, as is projecting impacts.
- Cap will apply to emissions already fully covered by carbon pricing or legislated reductions.
- A tonne of CO2 emissions can be paid for under the OBPS (carbon price) and the emissions cap (floating price).
- Methane and electricity subject to legislated (or proposed) reductions AND priced under the cap.
- Compliance with methane reductions may trigger obligations under OBPS.



Oil and Gas Emissions Regulatory Coverage Venn Diagram

Oil and Gas Sector Emissions: Key Points

1. Emissions data availability and variability is a major challenge in regulatory and policy design, as well as in the assessment of impacts on the oil and gas sector.

2. Not all emissions are created equal – abatement costs follow a marginal cost curve and Methane 45 has addresses many of the lower abatement cost emissions.

3. There is significant regional variation of the emissions profile of oil and gas production both within Saskatchewan and relative to other oil and gas producing jurisdictions.

Methane 75 Timeline

- November 2021 - at COP26 the federal government joined the Global Methane Pledge including a commitment to reduce methane emissions from the oil and gas industry by at least 75 per cent from 2012 levels by 2030
- March 2022 - Methane 75 Discussion Paper was released
- November 2022 - the federal government released a proposed regulatory framework
- December 2023 - the federal government posted the draft Methane 75 regulations and the regulatory impact assessment statement seeking feedback by February 14, 2024
- April/May 2024 - Industry feedback workshops
- Final regulations are targeted for fall 2024

Methane 75 Overview

- Objective to achieve a 75 per cent reduction in methane emissions from the oil and gas industry by 2030
- Methane 75 addresses venting, flaring and fugitives
- Rules are phased in and apply in 2027 unless existing wells have declining production then rules apply in 2030

Venting – Casing Gas and Storage Tanks

- Prohibited except:
  - For health and safety or maintenance reasons
  - Where heating value is not sufficient to sustain combustion
- All pressurized equipment components must be connected to destruction or conservation equipment
- ISSUE: SK has intermittent and low volume flow rates that are difficult to collect and combust
- ISSUE: SK has wells that will be considered uneconomic with additional investment
- ISSUE: Venting that moves to combustion could be subject to compliance obligations under OBPS

Venting – Pneumatic Devices & Compressors

- No emissions allowed post 2030
- Equipment components must be connected to hydrocarbon gas conservation equipment or destruction equipment
- ISSUE: All high or low bleed gas driven pneumatics will require replacement (air driven or electrification)
- ISSUE: Full tie-in of equipment would be technically challenging and prohibitively expensive on some sites

Flaring

- Prohibited except:
  - Efficiency of 98 per cent with automatic ignition (enclosed combustors)
  - For health and safety reasons
  - Where an engineering study concludes use for heat or energy is not feasible
- ISSUE: SK has intermittent and low volume flow rates that are difficult to collect and combust
- ISSUE: It is unknown, what is required of an 'engineering study'
- ISSUE: Existing flare stacks will need to be replaced with combustors that have auto ignition and 98 per cent efficiency

Fugitive Emissions

- Requirements split between type 1 (high risk) and type 2 (low risk) facilities
  - Type 1 - Inspection programs are required including 4x/year comprehensive inspection
  - Type 2 – Annual comprehensive inspection
- Screening inspections needed once per month and an audit inspection once per year
- Fugitive emission detection and repair program or continuous monitoring must exist
- ISSUE: There is no consideration to reduce inspection frequencies even if data can prove frequency is unnecessary
- ISSUE: A yearly audit should be considered one of the four inspections
- ISSUE: Industry does not consider continuous monitoring to be a cost-effective option
- ISSUE: Repair times are based on flow rates – mass flow rates difficult to obtain
- ISSUE: Inclusion of non-productive sites
- ISSUE: Lack of equipment and resources available

Methane 75 RIAS

- The federal government has published a Methane 75 Regulatory Impact Analysis Statement (RIAS)
- RIAS only considers the direct cost of meeting the regulations and assumes all facilities will comply
  - States incremental costs ‘might lead to some production losses’
- RIAS applies a ‘social cost of carbon’ escalating from $273 in 2022 to $365 in 2040
  - This results in a net benefit to the Methane 75 regulations
- SK compliance cost estimated at $4.2 Billion
  - SK has a similar reduction (90 Mt) to AB (105 Mt) at half the cost

Methane 75 RIAS (continued)

- RIAS only considers incremental cost from the current Federal Methane Regulations to Methane 75
  - Cost of OGEMR is significantly less than the Federal Methane Regulations
- Current venting that moves to combustion could be subject to compliance costs under OBPS – these costs were not included in RIAS
  - This is the most likely compliance path for Saskatchewan facilities (existing and new) since collection of gas is unlikely

Federal Emissions Cap Timeline

- In November 2021, at COP26, Prime Minister Justin Trudeau announced that Canada will be the first country to impose a hard cap on emissions from the oil and gas sector.
- In July 2022, the Federal government released a Discussion Paper proposing two options: cap-and-trade **or** an increased carbon price for the oil and gas sector.
- In December 2023, the Federal government published a Regulatory Framework confirming cap-and-trade as the mechanism.
- Draft regulations expected in mid-2024; Final regulations planned for 2025; Implementation beginning as soon as 2026.

Federal Emissions Cap – What We Know

- A national system that applies to all GHG emissions from upstream oil and gas facilities, including Scope 2 emissions (excludes transportation and refining).

- The level of the emissions cap in 2030 will be set using 2019 production and assumes all "technically achievable" GHG reductions are implemented by 2030.

- The emissions cap requires a 35% to 38% reduction by 2030, to decline post 2030 to meet a net-zero target by 2050 (trajectory TBD).

- Includes "compliance flexibility", termed the legal upper bound, which permits production growth in line with the CER's Canada Net Zero forecast.

Emissions Cap Level and Allowance

- Total 2019 Emissions Cap Coverage is = 171 megatonnes carbon dioxide equivalent ($MtCO_2e$).
- The 2030 Allowance will be set at 106-112 $MtCO_2e$, determined by 2019 production and all 'technologically achievable" GHG emissions reductions by 2030.
- Compliance flexibility of 25 $MtCO_2e$ is included to allow for CER Canada Net Zero forecast production growth to 2030.

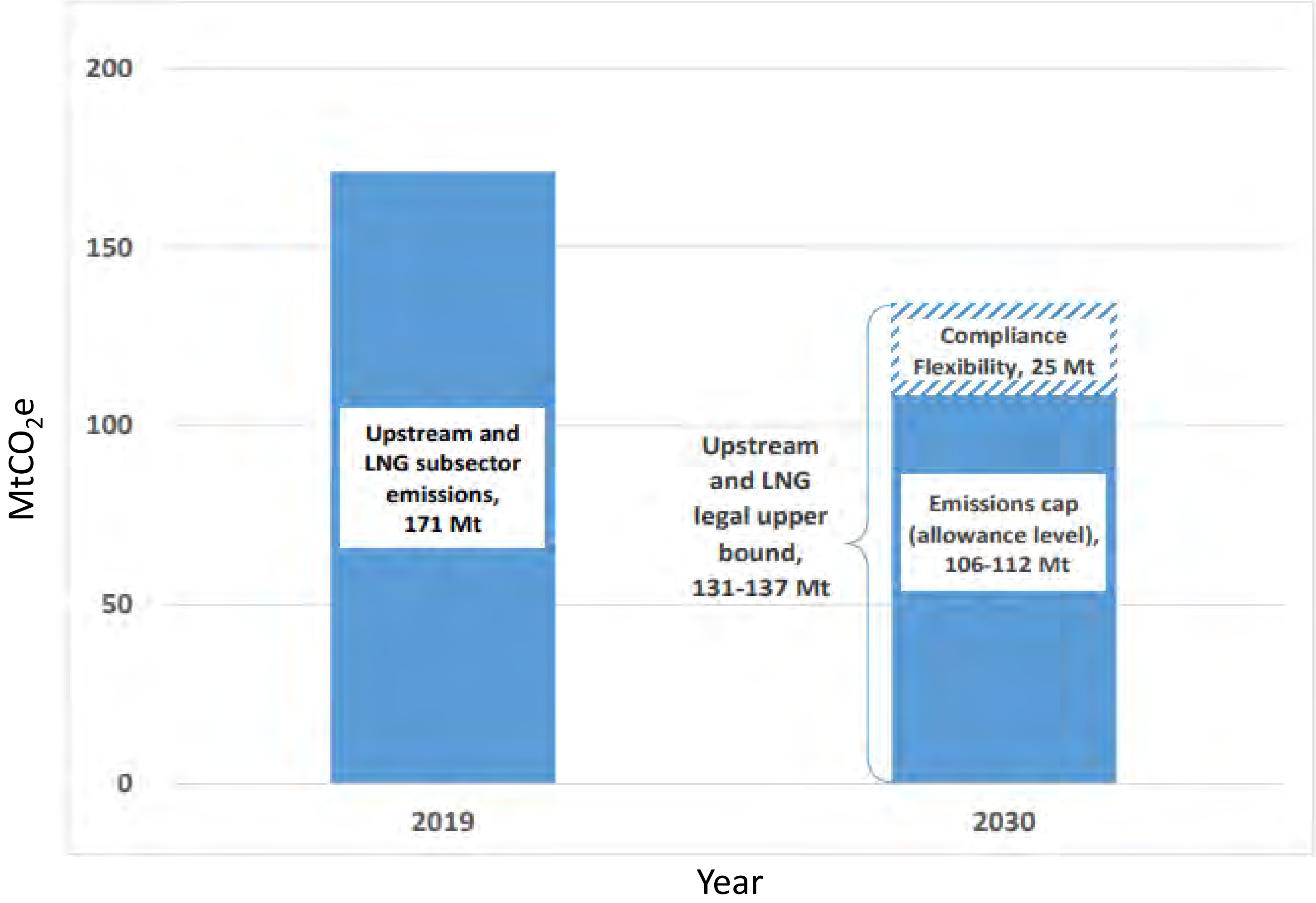
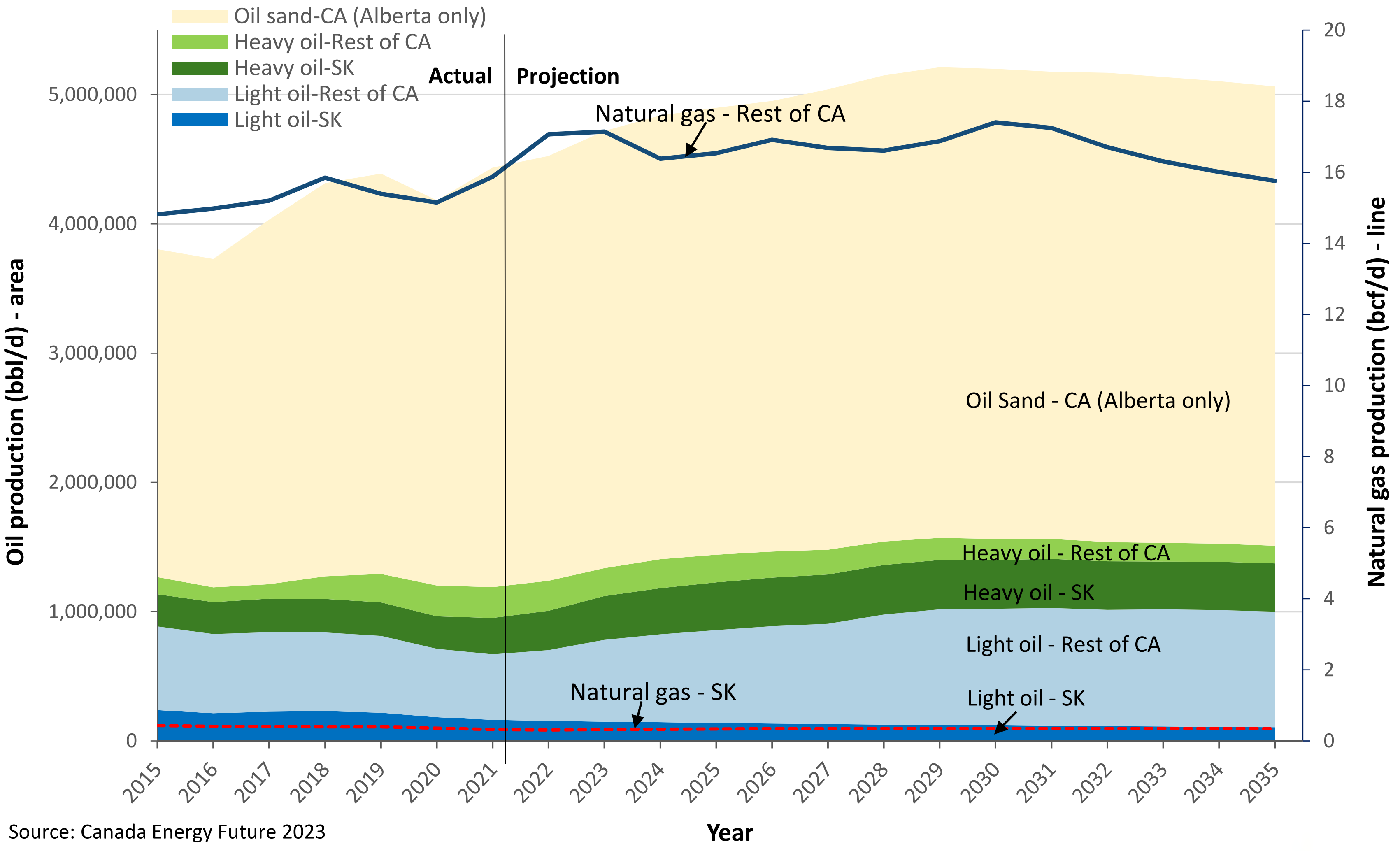


Fig 3: Estimated and projected oil and gas sector emissions (Mt CO_2e) in 2019 and 2030.

Canada Energy Regulator Forecast for Oil and Gas Production

- Cap modelling uses the CER's Canada Net-Zero Scenario (CNZ) forecast; CER's forecast data differs from that of SK.
- It assumes net zero for Paris Accord countries by 2050, and China and India by 2060 and 2070.
- The vast majority of current and projected production is expected to come from the oil sands.
- Saskatchewan contributed 27% of Canada's light oil, 54% of heavy oil, and 2.5% of natural gas in 2019.



Source: Canada Energy Future 2023

Oil and Gas Production Trends and Projections in Saskatchewan (SK) vs Rest of Canada (CA)

Federal Emissions Cap – What We Know

- Regulated facilities will be required to register in a system and be subject to quantification, verification, and annual reporting with third-party verification.

- The regulatory framework suggests all UOG facilities will be covered by the emissions cap and are considering an aggregation approach for small facilities.

- Covered facilities will be prohibited from releasing emissions without remitting the corresponding emissions allowances.

- The allocation of emissions allowances will initially be free, but the regulatory framework signals moving to an auction in future compliance periods.

Federal Emissions Cap – What We Know

- Compliance periods will be 3-years with an ability to bank emissions allowances for 2 compliance periods (6 years).
- Flexible compliance pathways, which permit production growth relative to 2019 levels, include: emissions offsets, ITMOs, and a proposed federal decarbonization fund.
- Facilities can achieve a maximum of 20% of their compliance through these mechanisms (offsets and ITMOs @ 10% and decarbonization fund @10%).
- The emissions cap will account for transfer of thermal energy, hydrogen, CO2, and electricity to ensure all production related emissions are covered.

Federal Emissions Cap – What We Don't Know

- Emissions cap design relied on application of all "technically achievable" emissions reductions by 2030 relative to 2019 production – no details have been shared.
  - Not clear what technologies were applied – no way to examine assumptions;
  - If assumptions are ambitious, meeting reductions targets not feasible;
  - Then, considerations of economic feasibility and timelines have to be layered in.

- It is not clear how the federal government will allocate emissions allowances to light, heavy, and ultra-heavy oil types.
  - Framework suggests the cap will recognize "better performers", pointing to use of average emissions intensities to allocate emissions allowances.
  - This would negatively impact facilities, or regions, with higher emissions intensities.
  - Without this information, cannot estimate pricing signal or costs and impacts.

- Compliance pathway post 2030, to net zero by 2050, unclear.

Implications of Emissions Cap Design

- The emissions cap is a de facto cap on production.

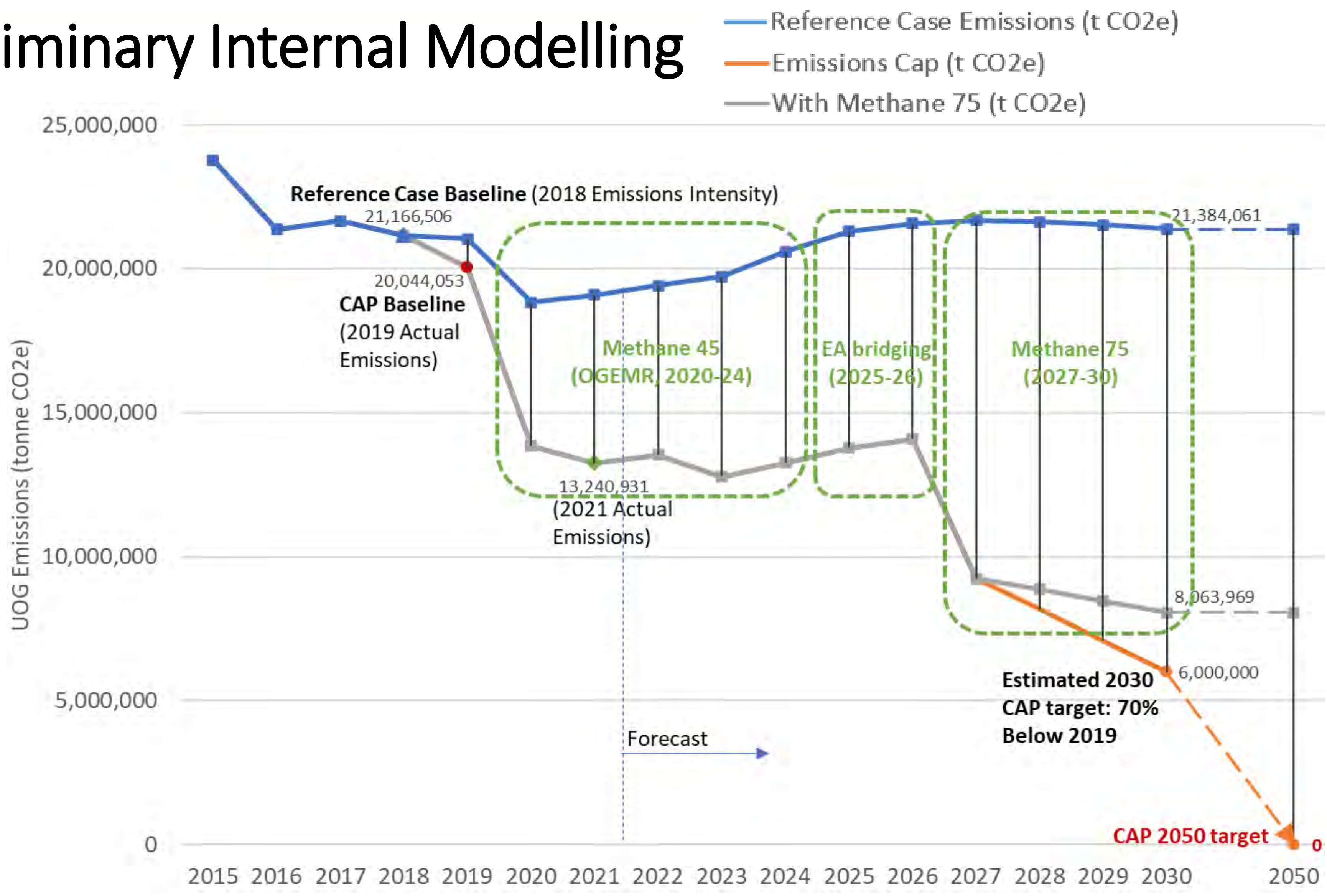
- Demand for emissions allowances likely to exceed supply:
  - Ambitious assumptions about “technically achievable”;
  - No consideration of economic feasibility or deployment timelines;
  - Compliance flexibility pathways not robust;
  - CER Canada Net Zero production forecast accuracy concerns.

- Thus, the price signal under the emissions cap is likely to exceed federal suggestion of $50 per tonne (incremental to carbon pricing).

- Use of NIR emissions intensities to allocate emissions allowances will disproportionately affect Saskatchewan conventional oil production.

Preliminary Internal Modelling

- The baseline (blue line) assumes an emission profile without methane or emissions cap policies applied.
- Emissions reductions under methane regulations are shown by the grey line.
- To meet the Cap (orange line) a reduction of **15.4 Mt in 2030** (70% below baseline) is required.
- Methane policies reduce large percentage of emissions by 2030, yet other reductions will be required.
- Post 2030, additional reductions will be needed from fuel sources or carbon dioxide emissions.



UOG Emissions Under Various Scenarios with Required Emission Reductions

Preliminary Internal Modelling Results

- Two sources of production impacts:
  - Shut-in production where it is uneconomic to comply;
  - Reduced investment in future drilling.

- Prod. at risk (incl. M75): **100,000 to 150,000 barrels per day (20% to 30%)**

- Royalty/Tax revenue at risk: $150M to $250M annually

- Impacts highest in regions that lack gas gathering and collection infrastructure (CHOPS, Viking, etc.).

External Modelling Work To Date

- Have engaged with Navius to build on work already completed by the Government of Saskatchewan to look at sector specific and economy-wide impacts of the Emissions Cap and Methane 75;

- Consideration being given to secure a second third-party modelling tool that could provide more insight into sector-specific impacts and to validate internal modelling results;

- Procuring a third-party study to evaluate costs and barriers to incremental associated gas conservation in Saskatchewan.

Conclusions

- Emissions Cap and Methane 75 likely to have a disproportionate impact on Saskatchewan conventional production.

- Likely to need several tools/methods to assess the economic impacts of the Emissions Cap and Methane 75 – bottom-up vs top-down.

- Open to a more fulsome and dedicated discussion on modelling these policies.

SCHEDULE 8
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

MINISTRY OF ENERGY AND RESOURCES SLIDES
DATED JULY, 2024

Impacts of Federal Draft Methane 75 Regulations and the Oil and Gas Emissions Cap Regulatory Framework on Saskatchewan's Economy

Ministry of Energy and Resources
July 2024

saskatchewan.ca

Saskatchewan

Presentation Overview

- Part 1: Draft Regulations and Impacts of Methane 75
- Part 2: Draft Regulatory Framework – Oil and Gas Emissions Cap
- Part 3: Overview of Modelling Framework
- Part 4: Modelling Results and Extended Analysis
- Part 5: Key Insights
- Supplemental Slides

The Ministry of Energy and Resources

- The Ministry develops, coordinates and implements policies and programs to promote the growth and responsible development of the province's oil and gas industry. The Ministry is the full lifecycle regulator of Saskatchewan's oil and gas sector.

- In 2022-23, the Ministry had 277 full-time employees, with a main office in Regina and regional offices in each oil producing region (Swift Current, Estevan, Kindersley, and Lloydminster.)

- The Ministry's staff has a detailed and local-level understanding of Saskatchewan's oil and gas industry and has been the lead agency in regulating and supporting the sector for over 70 years.

- The Ministry also has deep expertise in emissions policy and regulations. The modelling work contained in this submission reflect that expertise, experience and local knowledge.

Methane 75 – What We Know

- Objective to achieve a 75 per cent reduction in national methane emissions from the oil and gas industry by 2030 *
- Methane 75 addresses almost all methane sources from the upstream oil and gas industry including venting, flaring and fugitive emissions (leaks)
  - Compliance requires investment at every existing well and facility and adds additional costs to future development
- Requirements apply in 2027
  - Existing wells and facilities with a declining production profile have until 2030
- Final regulations are anticipated late in 2024

Methane 75 - Draft Requirements

- Venting – Casing Gas and Storage Tanks
  - Venting is prohibited with minor exceptions (health and safety)
  - All pressurized equipment components must be connected to destruction or conservation equipment
- Venting – Pneumatic Devices & Compressors
  - No emissions allowed post 2030
  - Equipment components must be connected to hydrocarbon gas conservation equipment or destruction equipment
- Flaring
  - Prohibited with minor exceptions (health and safety)
  - Where an engineering study concludes use for heat or energy is not feasible
- Fugitive Emissions
  - Required at every site, combination of screenings, inspections or continuous monitoring *

Methane 75 - Modelling Approach

- Bottom-up approach
  - Applied Methane 75 draft requirements to each existing well and facility to determine provincial impacts
- Utilized current provincial data (2023)
  - 2023 represents the most accurate depiction of active upstream oil and gas infrastructure in Saskatchewan
  - Current Saskatchewan regulations are equivalent to existing federal regulations (Methane 45) *
- Emissions based on 2024 National Inventory Report (NIR) **
- Production and emissions impacts were forecast out to 2050 and serve as a starting point for the emissions cap analysis

Methane 75 - Modelling Approach

- **<u>Step 1</u>:** Methane 75 Compliance Actions and Costs
  - Determined compliance actions and corresponding capital costs (CAPEX) and operating costs (OPEX) for each requirement in the regulation
  - Compliance actions and costs are specific to SK facilities and production types
    - Costs from actual installations in the province
  - Compliance actions consider constraints of existing technologies

Methane 75 - Modelling Approach

- **Step 2**: Total Compliance Costs by Site
  - Applied compliance actions and costs to every well and facility in Saskatchewan to determine their respective CAPEX and OPEX

Emissions Source	Total CAPEX* ($ million)	Total OPEX* ($ million)
Venting	$ 1,128	$ 52
Fugitives	$ 55	$ 17
Flaring	$ 144	$ 8
Pneumatics	$ 90	$ 3
Compressors	$ 84	$ 1
Total	$ 1,501	$ 82

Methane 75 - Modelling Approach

- **Step 3**: Shut-In Analysis
  - Compared total compliance costs to revenue* by site to determine which sites would make investments and which would shut-in production

Production Class	2023 Oil Production (bbl/day)	2023 Shut-In Oil Production** (bbl/day)	2023 Shut-In Oil Production (%)
1 - Lloydminster	188,738	18,084	10%
2A - Kindersley Heavy	32,644	2,298	7%
2B - Kindersley Non-Heavy	55,022	10,546	19%
3 - Swift Current	41,739	1,821	4%
4 - Estevan	135,327	5,281	4%
Total	453,471	38,030	8%

Methane 75 - Modelling Approach

- **Step 4**: Total Cost of Compliance Actions
  - Calculated the investment required by all sites that met the economic threshold

Emissions Source	Total CAPEX ($ million)	Total OPEX ($ million)
Venting	$ 69	$ 3
Fugitives	$ 32	$ 10
Flaring	$ 88	$ 5
Pneumatics	$ 90	$ 3
Compressors	$ 84	$ 1
Total	$ 363	$ 22

Methane 75 - Modelling Approach

- **<u>Step 5</u>**: Emissions Adjustments *
  - Determined emissions reduced through compliance actions (investment) and shut-in production

	2023 Emissions (kilo tonnes CO_2e)		
	CO_2	**CH_4**	**Total**
Total Emissions	9,612	15,020	24,733
Shut-in Emissions Reduction	238	7,319	7,557
Compliance Action Emissions Reduction	-735**	6,517	5,782
Remaining Emissions	10,110	1,183	11,394

Methane 75 - Modelling Approach

- **<u>Step 6</u>**: Provincial Compliance & Abatement Costs
  - Determined abatement costs utilizing compliance costs and emissions adjustments*

	Total CAPEX Abatement Cost ($/tonne CO2e)	Total OPEX Abatement Cost ($/tonne CO2e)	Total Abatement Cost ($/tonne CO2e)
Total Compliance Cost (no shut-in)	$123.10	$6.72	$129.82
Actual Compliance Cost (considers shut-in)	$61.82	$3.76	$65.58

  - Determined the opportunity loss of shut-in production
    - $45/tonne CO_2e

Methane 75 - Modelling Approach

- **<u>Step 7</u>**: Forecasted Impacts
  - Results of the M75 analysis were subsequently applied to forecasted production and emissions to determine impacts out to 2050*
    - % of 2023 shut-in oil production
    - % emissions reductions due to investment (by emissions source)
    - % of emissions reductions due to shut-in (by emissions source)
    - CAPEX and OPEX abatement costs by emissions source ($/tonne CO_2e)
    - Opportunity loss from shut-in production ($/tonne CO_2e)
  - Forecasted emissions levels serve as a starting point to analyze the impacts of the federal emissions cap

Federal Emissions Cap – What We Know

- A national system that applies to all GHG emissions from upstream oil and gas facilities, including Scope 2 emissions (excludes transportation and refining).

- The level of the emissions cap in 2030 will be set using 2019 production and assumes all "technically achievable" GHG reductions are implemented by 2030.

- The emissions cap requires a 35% to 38% reduction by 2030, to decline post 2030 to meet a net-zero target by 2050 (trajectory TBD).*

- Includes "compliance flexibility" (max. 20% facility emissions), termed the legal upper bound, which permits production growth in line with the CER's Canada Net Zero scenario.

Emissions Cap Level and Compliance Flexibility

- Total 2019 Emissions Cap Coverage is = 171 megatonnes carbon dioxide equivalent ($MtCO_2e$).*
- The 2030 Allowance will be set at 106-112 $MtCO_2e$, determined by 2019 production and all 'technologically achievable" GHG emissions reductions by 2030.
- Compliance flexibility of 25 $MtCO_2e$ is included to allow for CER Canada Net Zero scenario production growth to 2030.

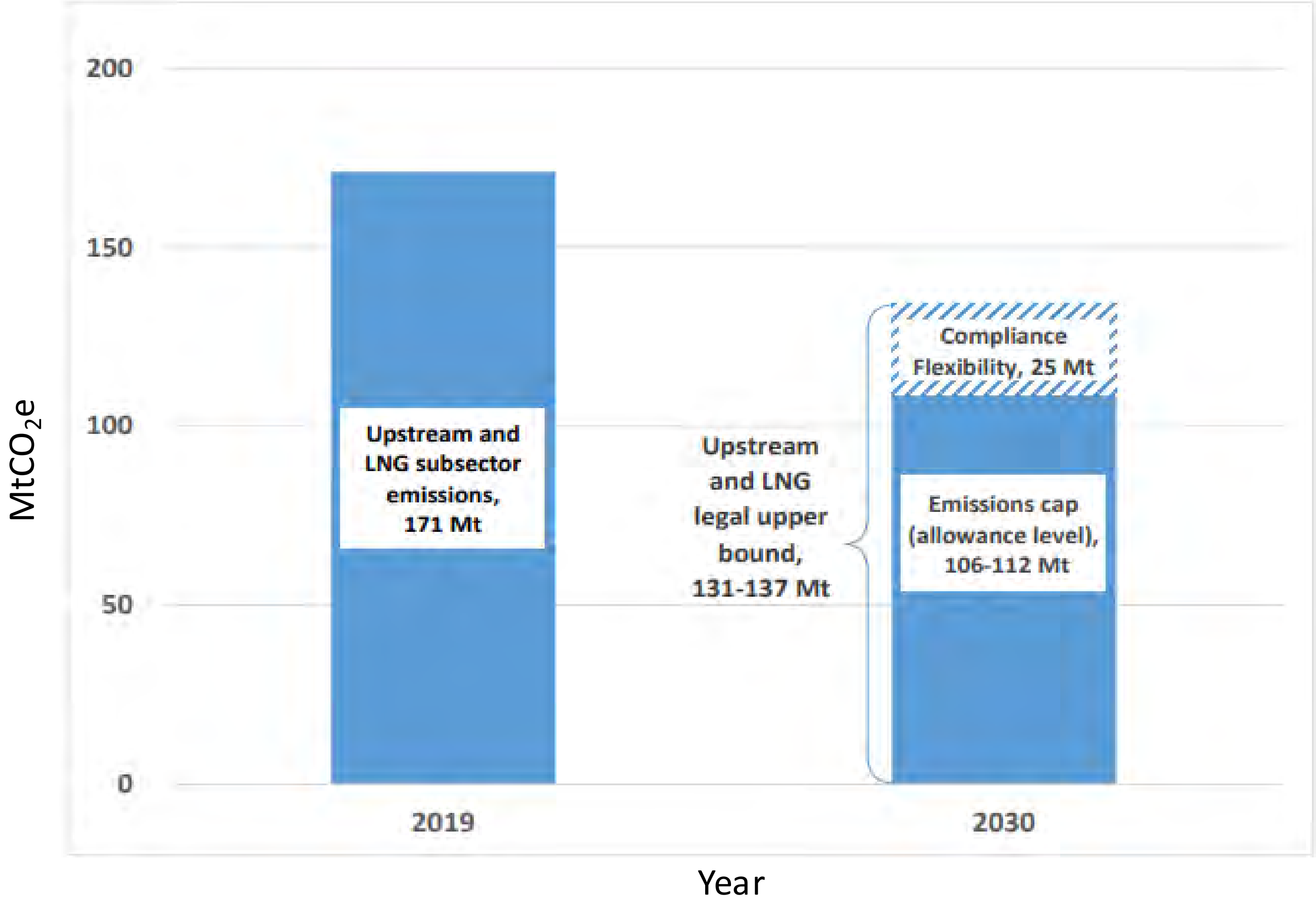


Fig 3: Estimated and projected oil and gas sector emissions (Mt CO_2e) in 2019 and 2030.

Federal Emissions Cap – What We Don't Know

- Federal modelling relied on application of all "technically achievable" emissions reductions by 2030 relative to 2019 production to establish the level of the cap.
  - Not clear what technologies were applied – no way to examine assumptions, no details shared;
  - If assumptions are ambitious, meeting reductions targets not feasible;
  - Then, considerations of economic feasibility and timelines should be assessed.

- It is not clear how the federal government will allocate emissions allowances to light, heavy, and ultra-heavy oil types.
  - Framework suggests the cap will recognize "better performers", pointing to use of average emissions intensities to allocate emissions allowances;
  - This would negatively impact facilities, or regions, with higher emissions intensities;
  - Without this information, cannot estimate pricing signal or costs and impacts.

- Compliance pathway post 2030, to net zero by 2050, unclear.

M75 and Emissions Cap Modelling Approach

ER's model:

- Examines the maximum allowable production, as constrained by the maximum allowable emissions under the Cap;
- Is a blend of bottom-up facility-level analysis of the impact of M75 and top-down sector-level analysis of the Cap;
- Examines *two compliance scenarios* based on varying levels of CCUS deployment and capture efficiency, a key determinant of impacts under the Cap; and
- Examines the impacts of M75 and the Cap on production and estimates compliance costs over the defined periods set out in the O.C.

- Additional analysis is performed off-model using the model outputs, including impacts on GDP, employment, investment, and royalty/taxes.

M75 and Emissions Cap Modelling Approach (cont’d)

- **Step 1:** Baseline Emissions Forecast (production + emissions intensity)
  - Relied on ER internal production forecast to 2050;*
  - Relied on 2024 federal NIR data for emissions intensities.**

- **Step 2:** SK’s Allowable Emissions Under the Cap
  - Relied on Table 2 in federal draft regulatory framework;
  - Determined SK’s share of emissions reductions obligations in 2030 (2024 NIR):
    - SK’s share of total national oil and gas sector emissions by production type; and
    - SK’s share of methane reductions via the federal RIAS for M75.
  - Projected the cap trajectory to net-zero by 2050 on a linear path.

- **Step 3:** Input bottom-up M75 analysis to account for these impacts.

Emissions Forecast: SK's Share of Required Reductions

- ECCC RIAS for M45 and M75 used to quantify SK's share of methane emissions reductions.
- Other reductions based on SK's emissions share in each reduction category in 2019 using 2024 NIR.
- **Estimated SK reduction obligation is higher than national average: 81% below 2019 by 2030 (vs. 41.5% total).**
- According to 2024 NIR data, SK's emissions intensities are higher than in other jurisdictions.

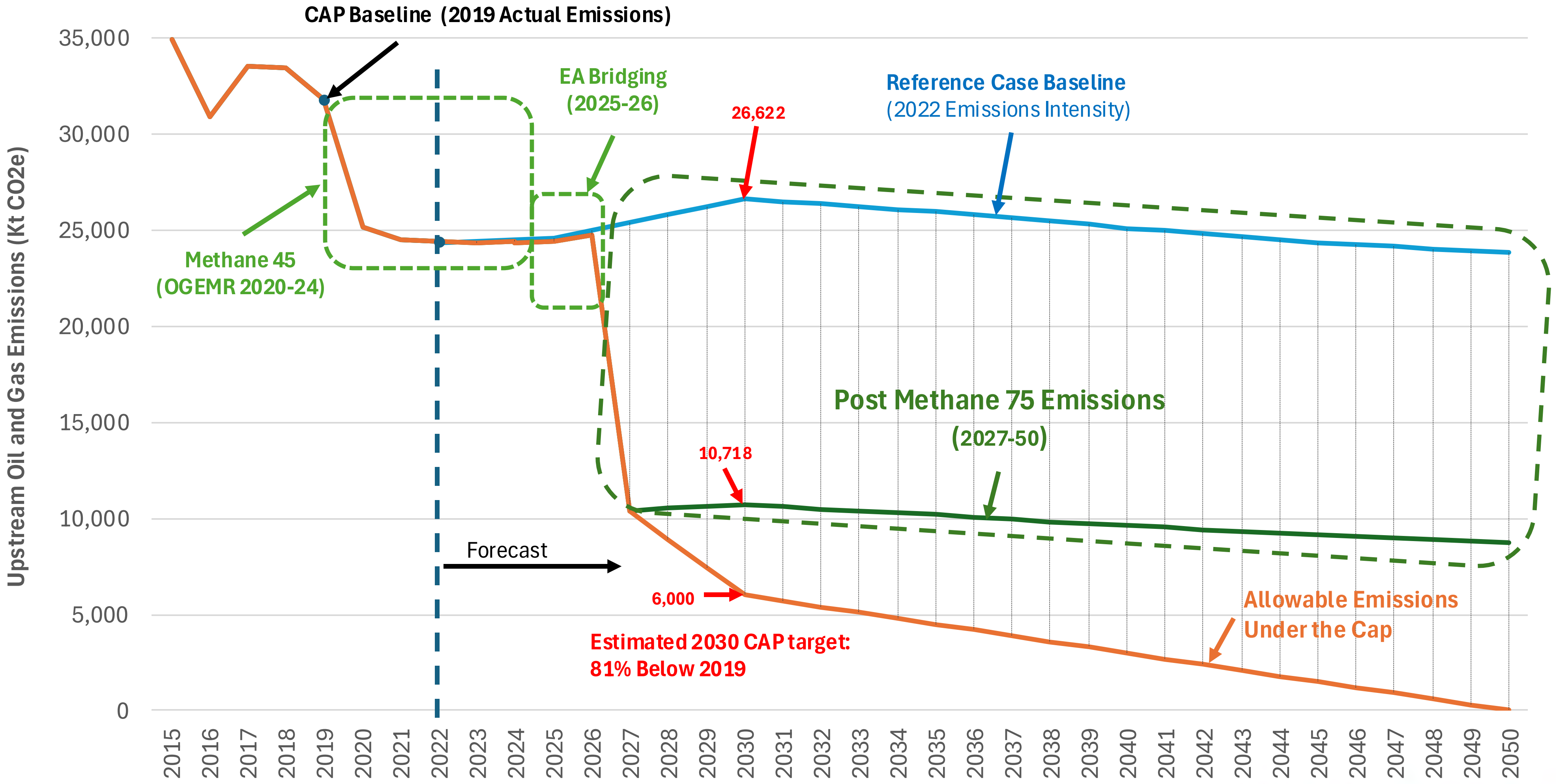
Table 2: Estimates of baseline GHG emissions, technically achievable GHG emissions reductions, 2030 emissions cap and legal upper bound (Mt CO_2e) *

	2019 Production Levels Scenario	
2030 GHG baseline emissions (total emissions without abatement)	195	*SK: 16% (31.8 Mt)* *AB: 76%* *ROC: 8%*
Technically achievable emissions reductions		
Oil Sands *(incl. Upgrading)*	-20	*SK: 2.7%*
Conventional oil	-1	*SK: 58.5%*
Natural Gas Production & Processing	-6	*SK: 3.2%*
LNG	0	
Methane (all sub-sectors)	-54	*SK: 45.3%*
Total estimated 2030 GHG emissions (with abatement)	114	*SK: 5% (6 Mt)*
The 2030 emissions cap and legal upper bound	**The 2030 emissions cap:** in the range of **106 to 112** *	

CA Total: -81 Mt (42% below 2019)

SK share: -25.8 Mt (81% below 2019)

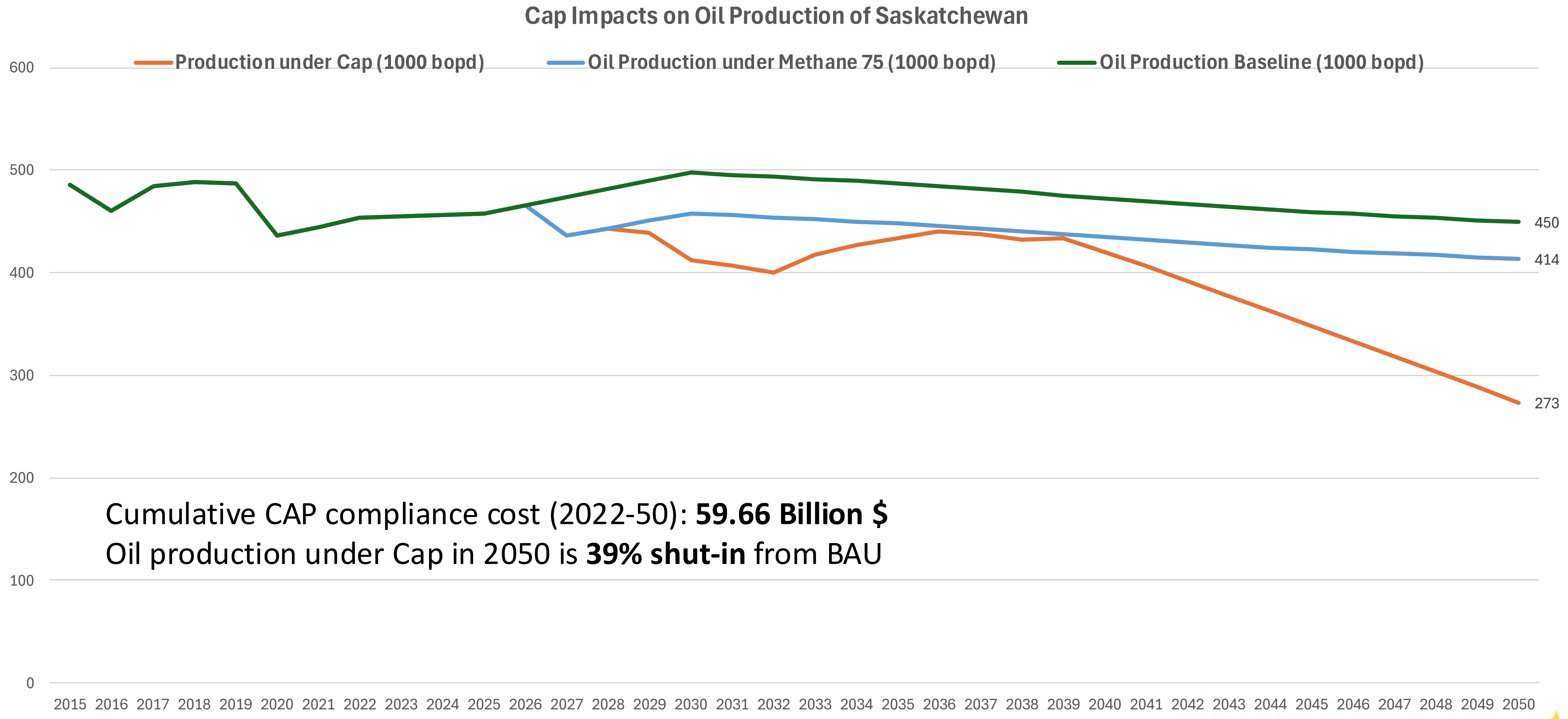
Emissions Forecast: SK's Upstream Oil and Gas Sector



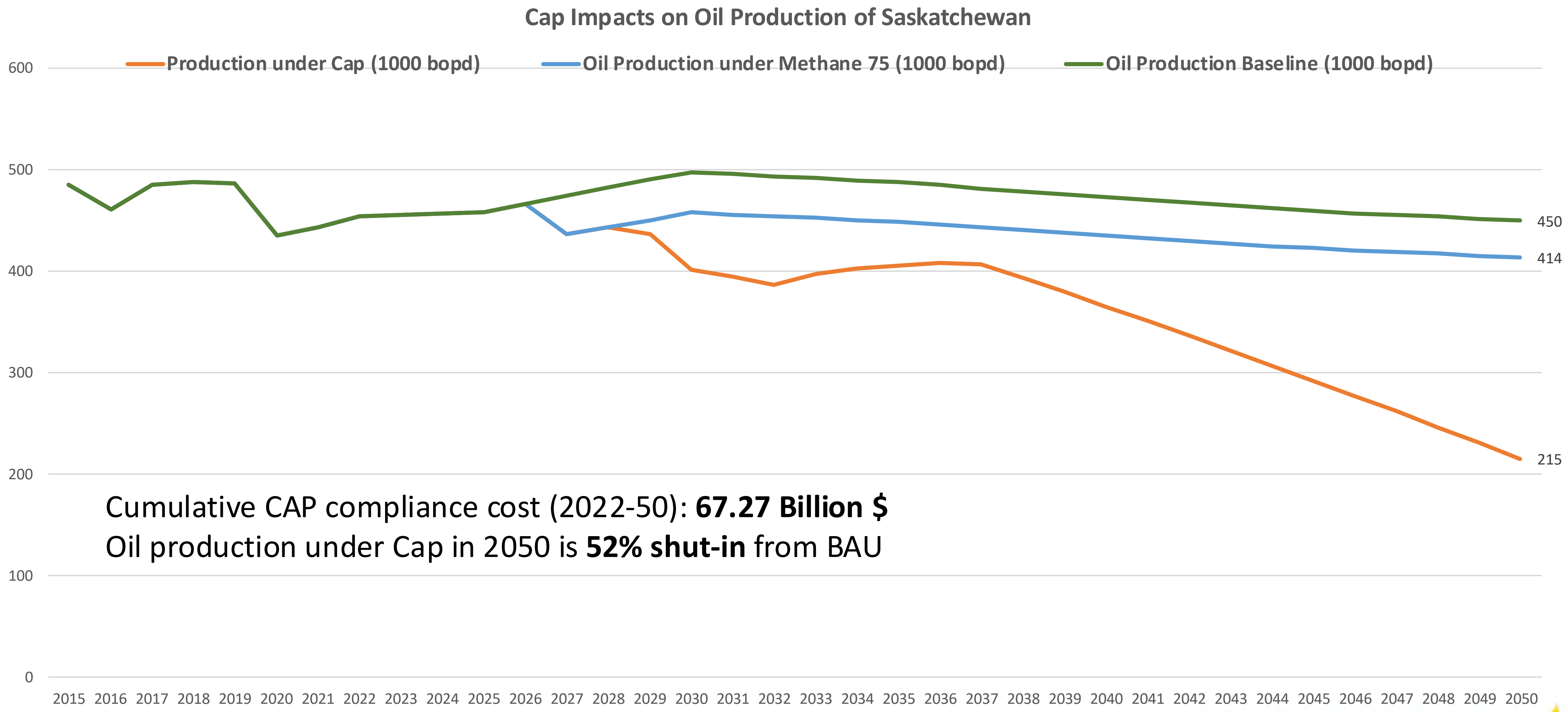
M75 and Emissions Cap Modelling Approach (cont'd)

- **Step 4:** Determined *two compliance scenarios* based on:
  - Varying the application and capture efficiency of CCUS;
  - Fixing purchase of allowances under the cap-and-trade scheme;
  - Fixing access to flexible compliance per the regulatory framework; and
  - Varying shut-in production to achieve remaining emissions reductions.
- **Step 5:** Determined the costs to industry and production impacts under the compliance scenarios, relative to the baseline.*
- **Step 6:** Used outputs of the model to extend the analysis to impacts on GDP, employment, investment, and royalty/tax revenues.

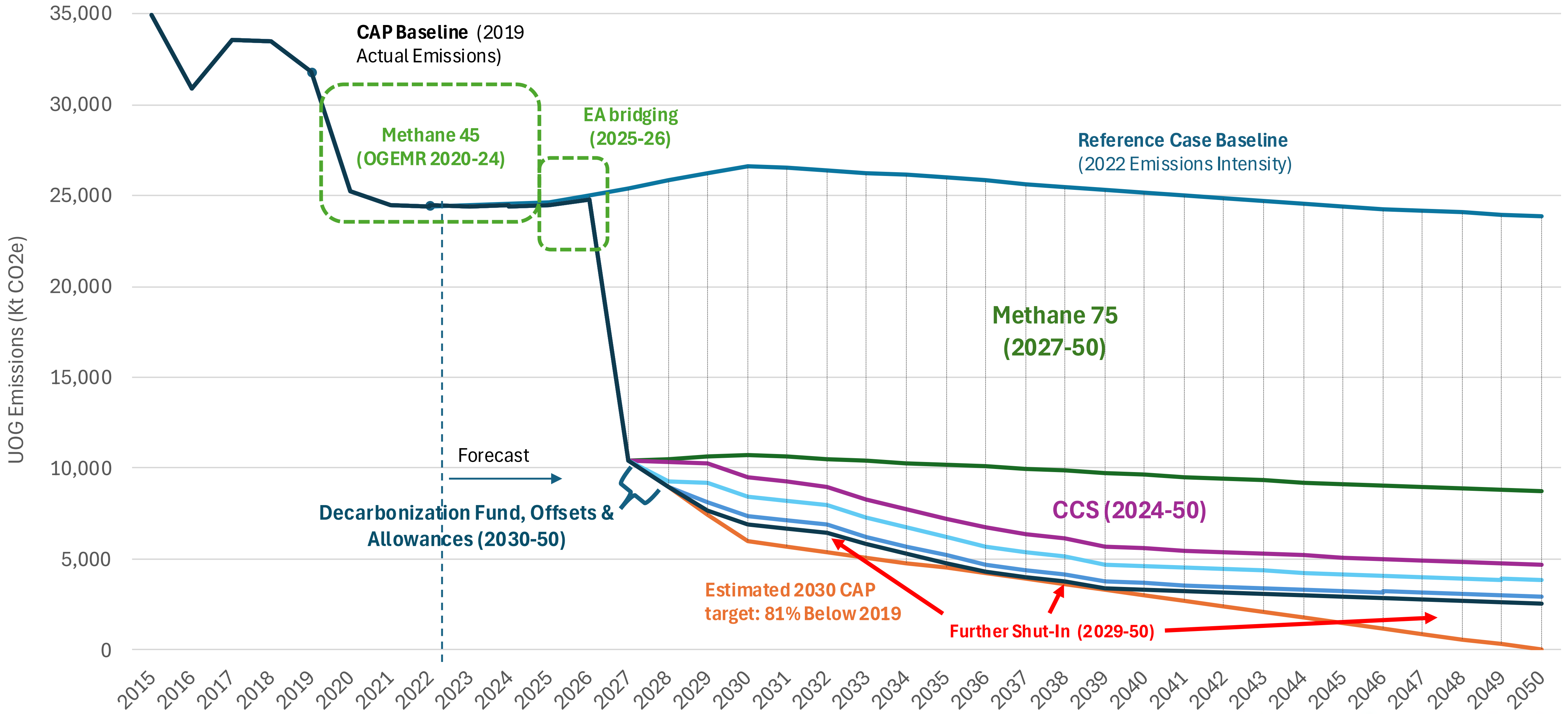
Scenario 1 – High CCUS: 4.0 $MtCO_2$ at 80% Capture Efficiency



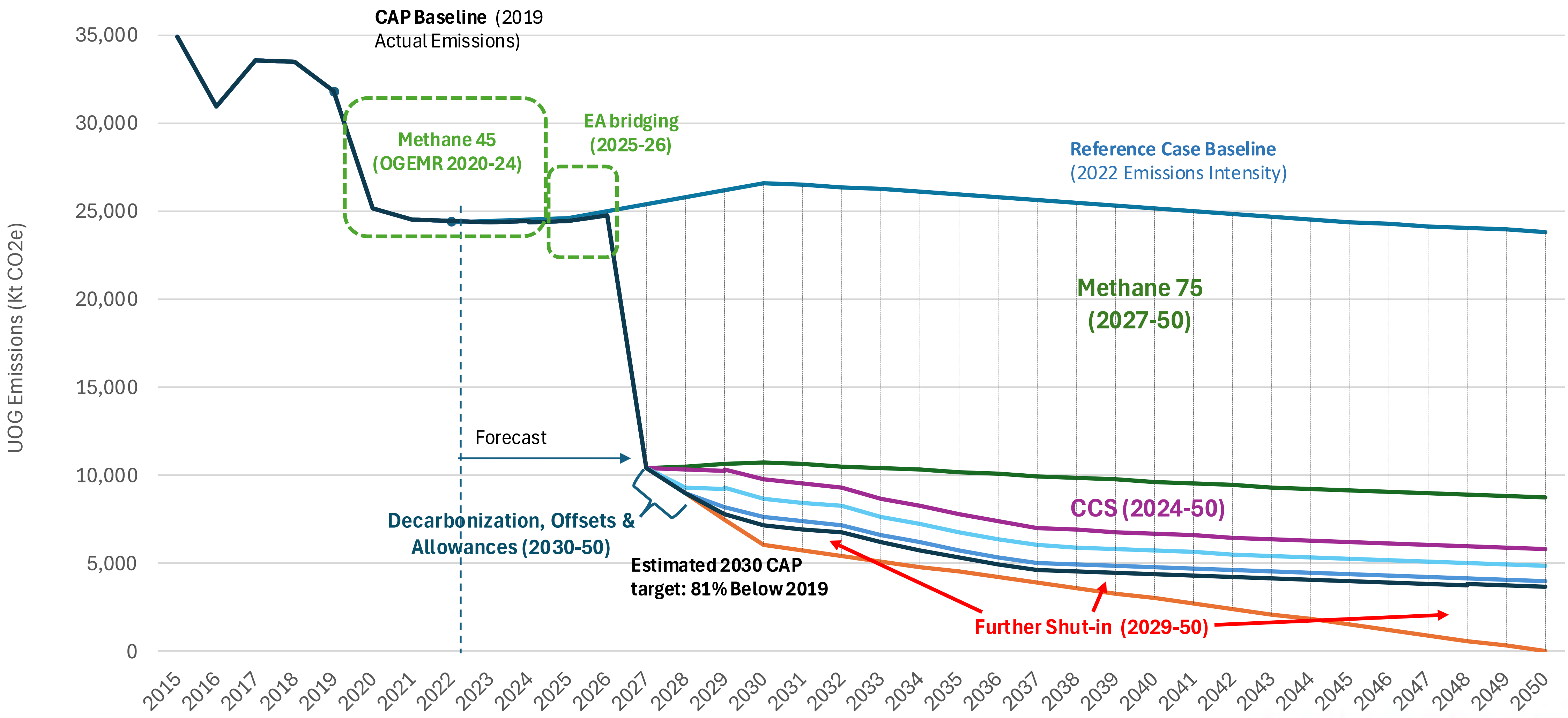
Scenario 2 – Lower CCUS: 3.0 $MtCO_2$ at 65% Capture Efficiency



Scenario 1 – High CCUS: 4.0 $MtCO_2$ at 80% Capture Efficiency



Scenario 2 – Lower CCUS: 3.0 $MtCO_2$ at 65% Capture Efficiency

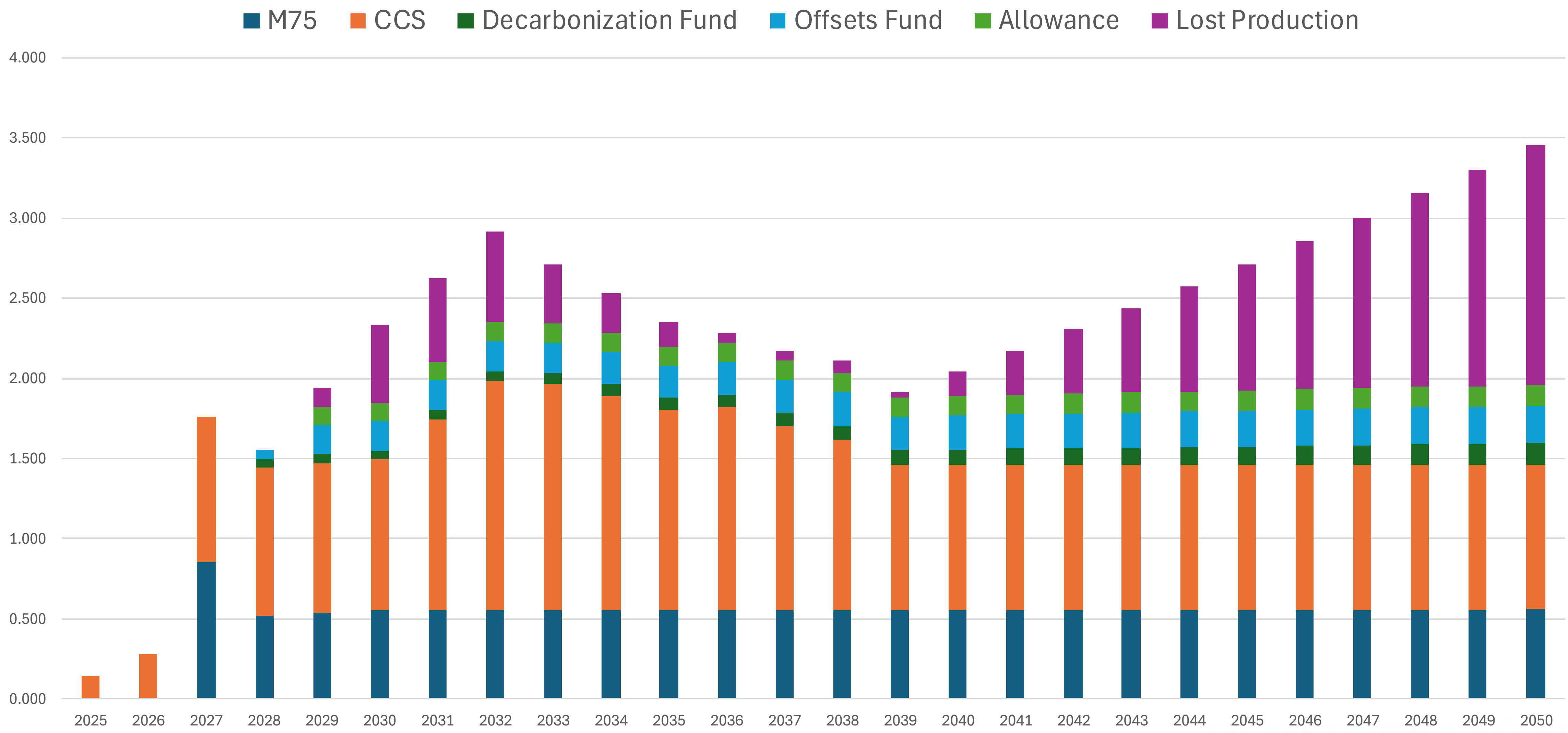


Results: Production Impacts

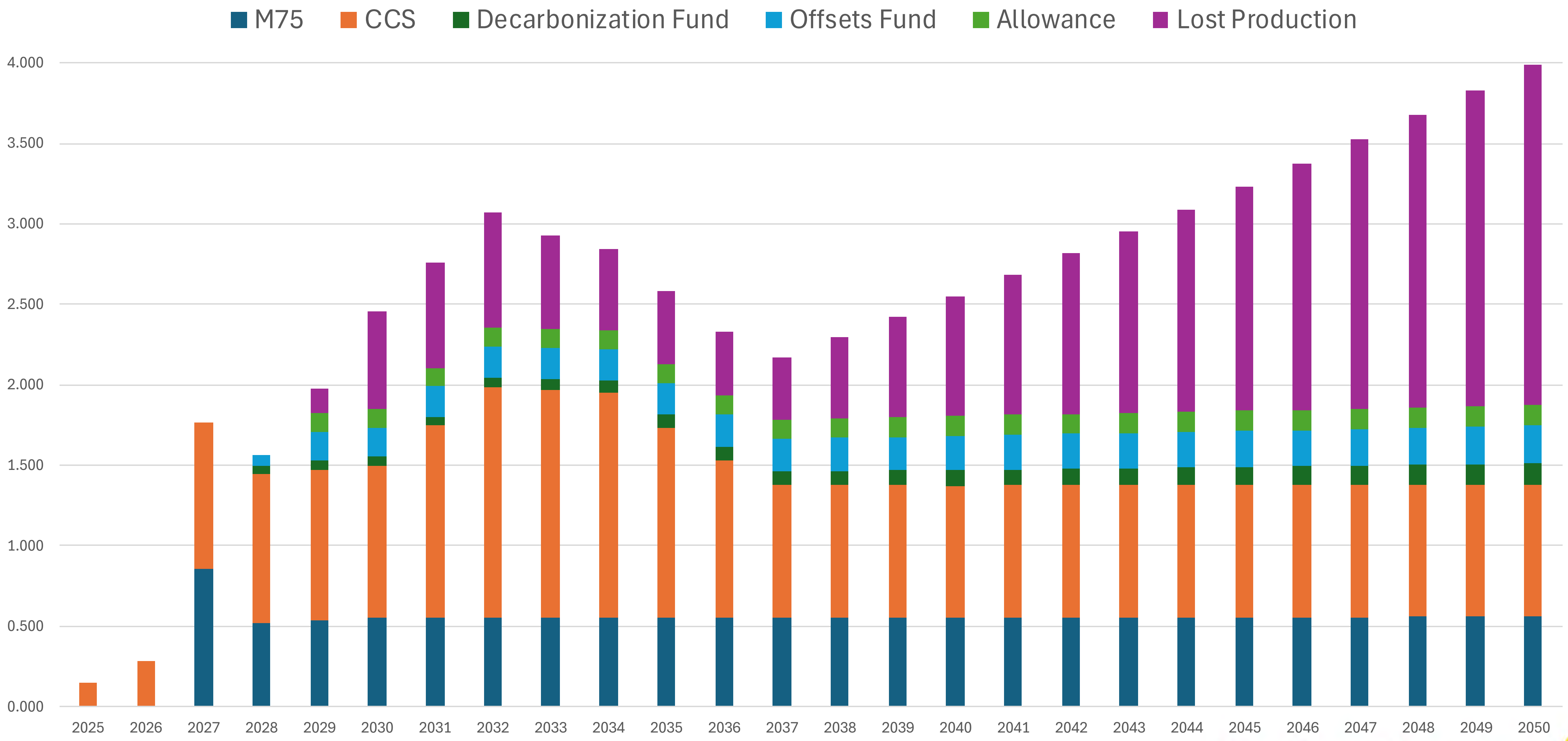
Production impacts of Methane 75 and the Emissions Cap in barrels per day (bpd) under modelled scenarios

	2030		2040		2050	
	High CCUS	Lower CCUS	High CCUS	Lower CCUS	High CCUS	Lower CCUS
Forecast Production (no M75 or Cap)*	498,000		473,000		450,000	
Shut-In Production M75	40,000 (8%)		38,000 (8%)		37,000 (8%)	
Shut-In Production M75 and the Cap	**86,000 (17%)**	**97,000 (19%)**	**53,000 (11%)**	**108,000 (23%)**	**177,000 (39%)**	**235,000 (52%)**

Scenario 1 - High CCUS: Breakdown of Annual Compliance Costs (B$)



Scenario 2 - Lower CCUS: Breakdown of Annual Compliance Costs (B$)



Results: Compliance Costs

Total Compliance Costs of Methane 75 and the Emissions Cap ($Billions, nominal)

	Up to 2030		2031 to 2040		2041 to 2050		Total
	High CCUS	Lower CCUS	High CCUS	Lower CCUS	High CCUS	Lower CCUS	
M75 Compliance Costs	$2.46		$5.52		$5.54		$13.53
Cap Compliance Costs	$5.55	$5.71	$18.14	$20.40	$22.44	$27.62	$46.13 - $53.74
Total Compliance Costs	**$8.02 - $8.18**		**$23.66 - $25.93**		**$27.99 - $33.16**		**$59.66 - $67.27**

Results: Royalties and Taxes

Reduced Royalty and Corporation Capital Tax Resource Surcharge (CCT/RS) Impacts of Methane 75 and the Emissions Cap ($Millions, nominal)*

	Up to 2030		2031 to 2040		2041 to 2050		Total
	High CCUS	Lower CCUS	High CCUS	Lower CCUS	High CCUS	Lower CCUS	
M75 and Cap Royalty Impact	$376	$401	$1,042	$1,586	$2,244	$3,309	$3,663 - $5,297
M75 and Cap CCT/RS Impact	$104	$111	$326	$500	$788	$1,161	$1,218 - $1,772
Total Royalty/Tax Impact**	**$480 - $512 (17% to 19% in 2030)**		**$1,368 - $2,086 (11% to 23% in 2040)**		**$3,032 - $4,470 (39% to 53% in 2050)**		**$4,881 - $7,069 (16% to 23%)**

Results: GDP, Employment, and Investment

Scenario 1: High CCUS: 4.0 $MtCO_2$ at 80% Capture Efficiency

	2030	2040	2050	Total Impact
Oil and Gas Sector Investment (2017 $B)	**-1.7 (-41%)**	**-1.6 (-33%)**	**-2.2 (-41%)**	**-43.3 (-36%)**
Provincial GDP (2017 $B)	**-4.0 (-4.2%)**	**-3.8 (-3.3%)**	**-5.3 (-4.0%)**	**-103.9 (-3.6%)**
Oil and Gas Sector Related Employment	**-14,160 (-19%)**	**-24,480 (-31%)**	**-31,500 (-37%)**	**-**
Direct	-2,360	-4,080	-5,250	-
Indirect	-4,720	-8,160	-10,500	-
Induced	-7,080	-12,240	-15,750	-

Results: GDP, Employment, and Investment

Scenario 2 – Lower CCUS: 3.0 $MtCO_2$ at 65% Capture Efficiency

	2030	2040	2050	Total Impact
Oil and Gas Sector Investment (2017 $B)	**-1.7 (-42%)**	**-1.7 (-37%)**	**-2.4 (-44%)**	**-45.8 (-38%)**
Provincial GDP (2017 $B)	**-4.1 (-4.3%)**	**-4.2 (-3.7%)**	**-5.8 (-4.3%)**	**-109.8 (-3.8%)**
Oil and Gas Sector Related Employment	**-14,400 (-20%)**	**-25,620 (-32%)**	**-33,540 (-40%)**	**-**
Direct	-2,400	-4,270	-5,590	-
Indirect	-4,800	-8,540	-11,180	-
Induced	-7,200	-12,810	-16,770	-

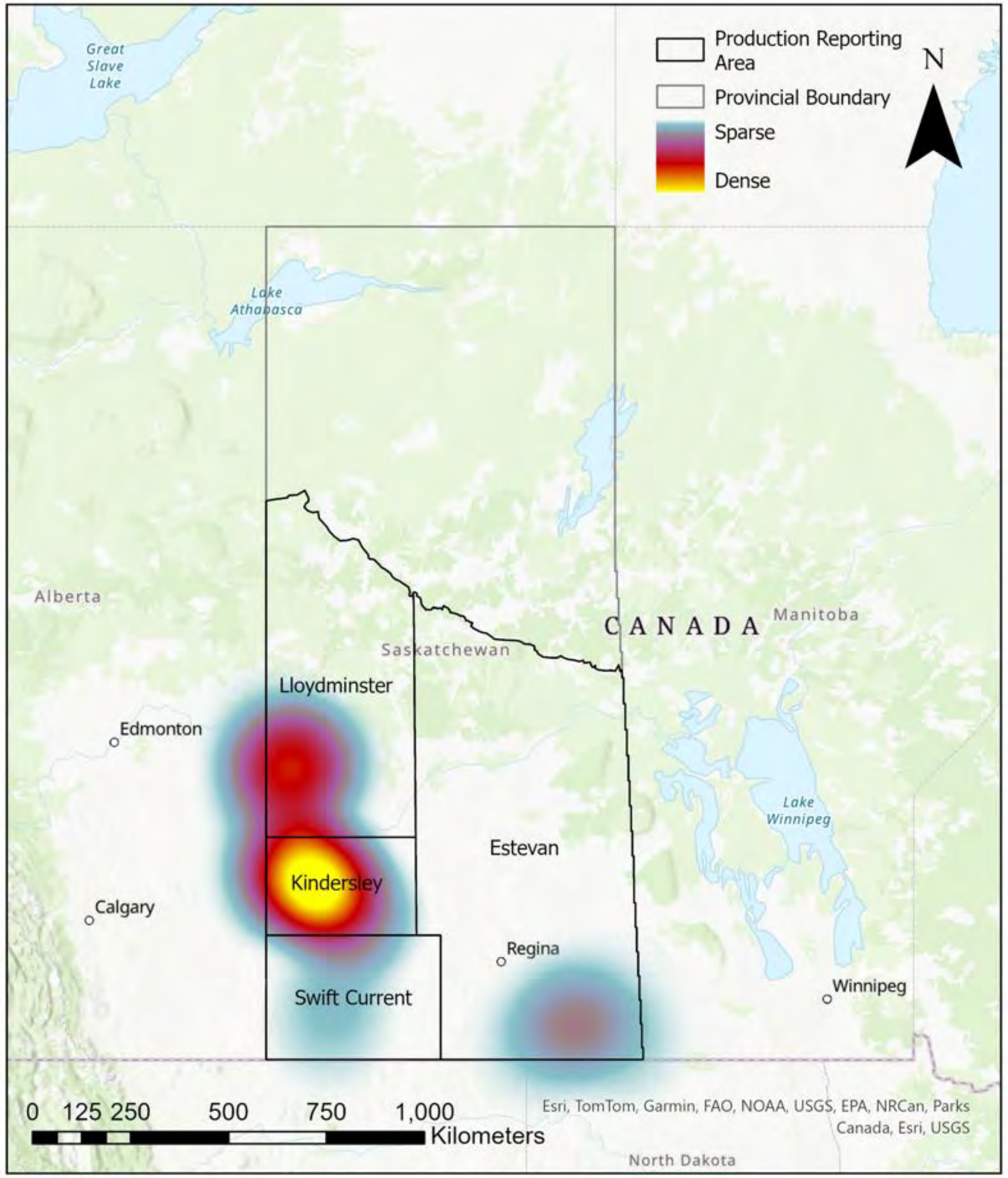
Key Insights – Methane 75

- While Methane 75 sets a national target to reduce overall methane emissions by 75%, it will have disproportionate effects on different oil producing regions and types, requiring a 90% reduction in SK.*

- Methane 75 is prescriptive and reduces industry flexibility to prioritize lower-cost methane abatement, resulting in higher shut-in production than is necessary to achieve the emissions reduction target.

- The oil producing regions in SK that will be most impacted are the Kindersley and Lloydminster areas, given the prevalence of Cold-Heavy Oil Production with Sand (CHOPS) and single-well batteries.

Key Insights: Methane 75 Sites Shut In



- **27%** of currently producing wells, almost **6,300** sites, will be shut in
- **85%** are Single Well Batteries
- **83%** of shut in sites are in the Lloydminster and Kindersley areas
  - 30% in Lloydminster
  - 53% in Kindersley
- Each site represents local jobs and benefits to the economy
  - Well operators – check daily
  - Services – well and maintenance
  - Surface Landowners – rental payments
  - Rural Municipalities – taxes

Saskatchewan

Key Insights – Emissions Cap

- The proposed federal Emissions Cap, as set out in the regulatory framework, **relies heavily on CCUS** as a compliance pathway, applied at facility types and scales **not yet demonstrated.**

- Even with optimistic assumptions about CCUS deployment, the Emissions Cap will have **significant production impacts in SK**. Considering the stated goal of the policy to reduce emissions and not production, **the proposed Emissions Cap goes too far too fast.**

- In the outer years, severe impacts can only be avoided by adjusting the level of the cap, increasing access to flexible compliance (at a cost), or relying on technologies not yet commercially available.*

Key Insights – Methane 75 and Emissions Cap

- If global demand deviates from the Canada Energy Regulator's Canada Net Zero scenario, the Emissions Cap will have little, if any, impact on global emissions while creating domestic economic harm.*
- The federal government has signaled that it does not intend to apply these same emissions standards to imported oil and gas products, potentially increasing Canada's reliance on imported energy.
- The oil and gas sector is a major contributor to SK's economy and is highly productive. These policies will result in significant impacts to the overall provincial economy and government revenues.**

Questions and Discussion

Supplemental Slides

Federal Emissions Cap Timeline

- In November 2021, at COP26, Prime Minister Justin Trudeau announced that Canada will be the first country to impose a hard cap on emissions from the oil and gas sector.

- In July 2022, the Federal government released a Discussion Paper proposing two options: cap-and-trade **or** an increased carbon price for the oil and gas sector.

- In December 2023, the Federal government published a Regulatory Framework confirming cap-and-trade as the mechanism.

- Draft regulations expected in mid-2024; Final regulations planned for 2025; Implementation beginning as soon as 2026.

Federal Emissions Cap – What We Know

- Compliance periods will be 3-years with an ability to bank emissions allowances for 2 compliance periods (6 years).

- Flexible compliance pathways, which permit production growth relative to 2019 levels, include: emissions offsets, ITMOs, and a proposed federal decarbonization fund.

- Facilities can achieve a maximum of 20% of their compliance through these mechanisms (offsets and ITMOs @ 10% and decarbonization fund @10%).

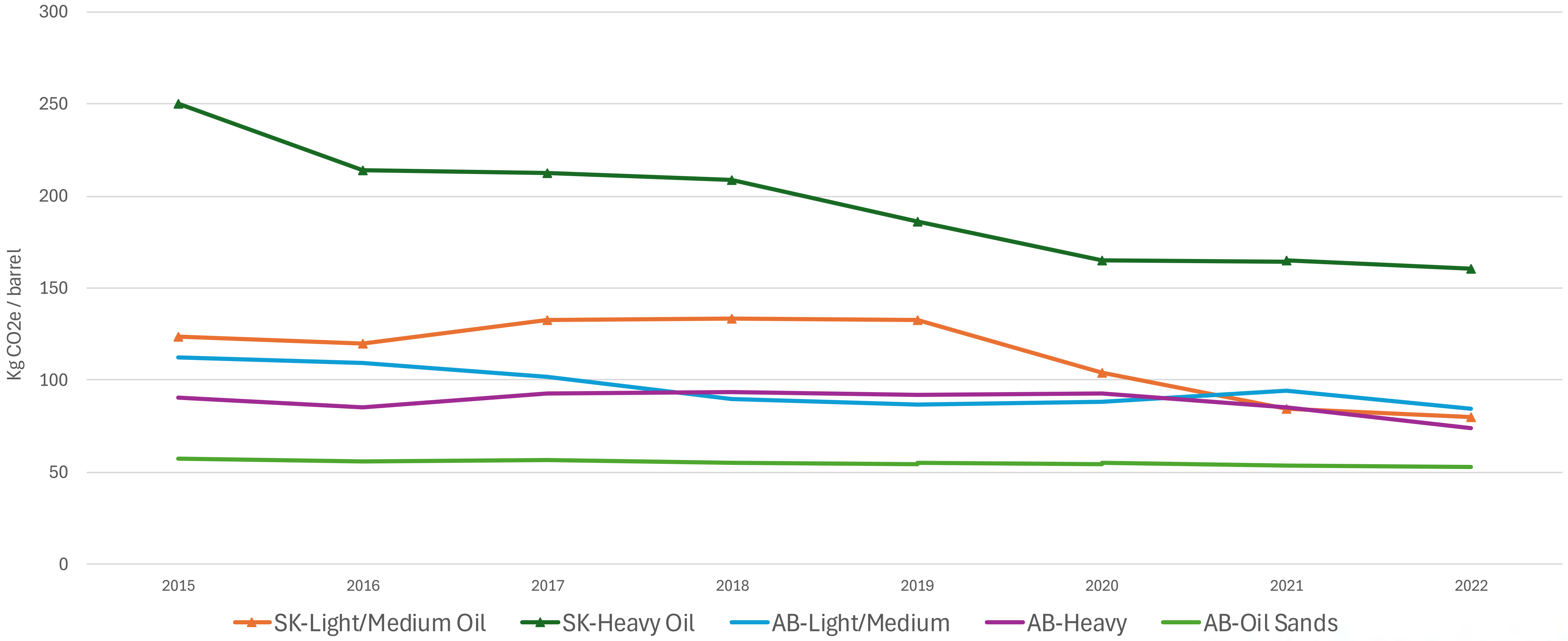
- The emissions cap will account for transfer of thermal energy, hydrogen, CO_2, and electricity to ensure all production related emissions are covered (i.e. Scope 2).*

Federal Emissions Cap – What We Know

- Regulated facilities will be required to register in a system and be subject to quantification, verification, and annual reporting with third-party verification.
- The regulatory framework suggests all UOG facilities will be covered by the emissions cap and are considering an aggregation approach for small facilities.
- Covered facilities will be prohibited from releasing emissions without remitting the corresponding emissions allowances.
- The allocation of emissions allowances will initially be free, but the regulatory framework signals potential to move to an auction in future compliance periods.

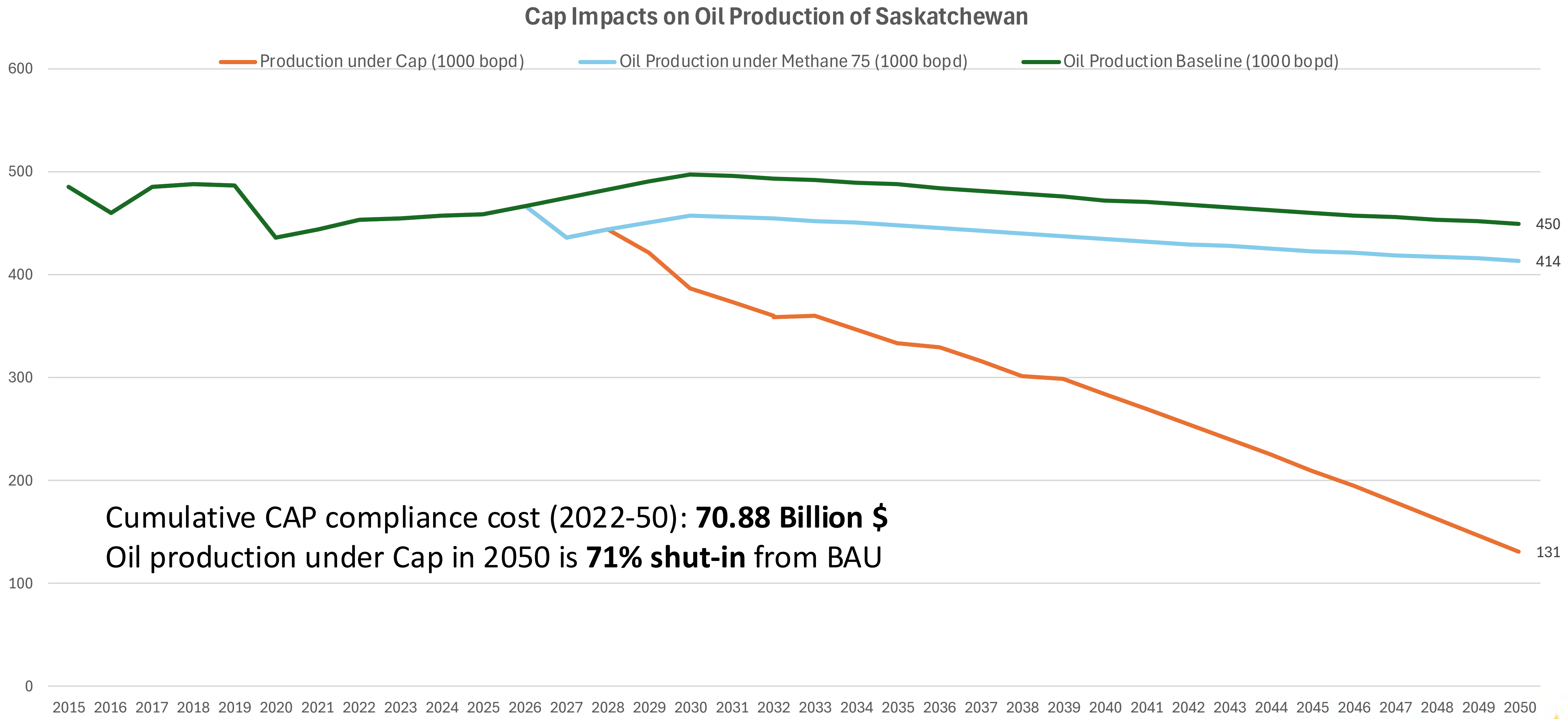
Oil Production Emissions Intensity: SK vs. AB

- According to the 2024 federal National Inventory Report on emissions, Saskatchewan's heavy oil production has a much higher emissions intensity than Alberta.



Comparison of Oil Production Emissions Intensity from 2015 to 2022 *Source: National Inventory Report 2024.*

Alternative Scenario – Low CCS: 1.4 $MtCO_2$ at 65% Capture Efficiency



M75 and Emissions Cap Modelling Key Assumptions (Structure)

- The level of the Emissions Cap will decline on a linear trajectory to net-zero for the upstream oil and gas sector by 2050;*
- For forecasting purposes, it was assumed that the structure of the industry remains similar into the future (ex: facility types);
- An efficiency improvement factor of 0.7% per year is applied to all stationary combustion emissions, reflecting historical trends in the NIR;
- Flexible compliance options will remain fixed at a maximum of 20% of a facility's emissions (offsets, ITMOs, and Decarbonization Fund);
- Emissions allowances will be allocated based on average emissions intensities of the oil types identified in the Regulatory Framework;**
- While the Regulatory Framework contemplates auctioning of allowances in the future, this analysis assumes free allocation.

M75 and Emissions Cap Modelling Assumptions (Pricing)

- The carbon price will rise to $170 per tonne in 2030, as scheduled, and increase by $5/tonne/year to maintain real price in future years;*

- The price of offsets will track the carbon price, given the scale of provincial carbon pricing programs;

- Payments into the decarbonization fund will start at $50/tonne**, and rise by $5/tonne/year to maintain real price in future years;

- The price of traded allowances under the Cap will track the levelized cost of CCUS, the primary alternative abatement opportunity.

M75 and Emissions Cap Modelling Assumptions (Compliance)

- Methane 75 compliance costs and production impacts were analyzed separate from the model and treated as a one-time shock;

- Costs of shut-in production derived from average netback per barrel ($29.22);*

- SK facilities will maximize their use of flexible compliance, which will be applied at the sector level (10% for offsets and ITMOs and 10% for Decarbonization Fund contributions);

- The volume of traded allowances under the cap is fixed at 4%** of total SK upstream oil and gas emissions. This reflects the view that:
  - The trajectory of the cap, and lack of consideration of economic feasibility, will limit the availability of traded allowances; and
  - Producers will take advantage of allowance banking to preserve their opportunity to grow production in the future.

M75 and Emissions Cap Modelling Assumptions (Technology)

Scenario 1: High CCUS Deployment/Efficiency

- All Upstream Oil and Gas facilities under the Cap **>100,000 tCO_2/yr** leverage CO_2 capture technology (18 facilities);
- **80%** of emissions from each facility is captured (high);
- CO_2 capture technology is installed on **ideal timelines;**
- Capital costs: **$25.13B**
- Approximate total CO_2 captured: **4.0 MtCO_2**

Scenario 2: Low CCUS Deployment/Efficiency

- All Upstream Oil and Gas facilities under the Cap **>150,000 tCO_2/yr** leverage CO_2 capture technology (14 facilities);
- **65%** of CO_2 emissions from each facility is captured (reasonable);
- CO_2 capture technology is installed on more **extended timelines;**
- Capital costs: **$23.21B**
- Approximate total CO_2 capture: **3.0 MtCO_2**

M75 and Emissions Cap Modelling Assumptions (Technology)

- The levelized cost (Capex and Opex) of CCUS over a 20-year project life-span is $270/tonne.
  - This estimate is derived from known cost estimates of projects in SK and is consistent with the range of costs identified in literature.*

Capture Facility Type	**Reference Cost (US$/annual tonne)**	
(Source: Gaffney Cline, 2020)	**Low**	**High**
Coal Power Plant	245.12	408.54
Natural Gas Processing	59.74	99.56
Natural Gas Power Plant	265.49	442.49
Hydrogen Production	147.27	245.45
Cement Plant	149.55	249.24
Ammonia Production	53.46	89.10
Ethanol Production	53.46	89.10
Refinery Fluidized Catalytic Cracker	308.90	514.83
Steel/Iron Plant	205.90	343.17
Industrial furnaces	354.28	590.47

M75 and Emissions Cap Modelling: What Was Not Considered

- **Scope 2 Emissions:** ER's modelling did not account for Scope 2 emissions. The federal government has signaled that it may reconsider the inclusion of Scope 2 emissions under the Cap.

- **CCUS Incentives:** ER's modelling did not account for CCUS incentives, like the federal CCUS Investment Tax Credit.*

- **Methane 45 and Provincial OBPS:** ER's analysis focused on the incremental effects of Methane 75 and the Emissions Cap. Consideration of carbon pricing was only given under the OBPS where compliance with Methane 75 resulted in an increase in CO_2 emissions.**

- **Provincial OBPS Credit Generation:** ER's modelling did not account for CCUS credit generation under the provincial OBPS program, which allows emitters that reduce their emissions below their OBPS obligations to monetize excess credits.

- **New Technologies:** ER's modelling did not account for deployment of new technologies that have not been proven at scale. The analysis does consider access to offset credits, which could be generated from a variety of sources.***

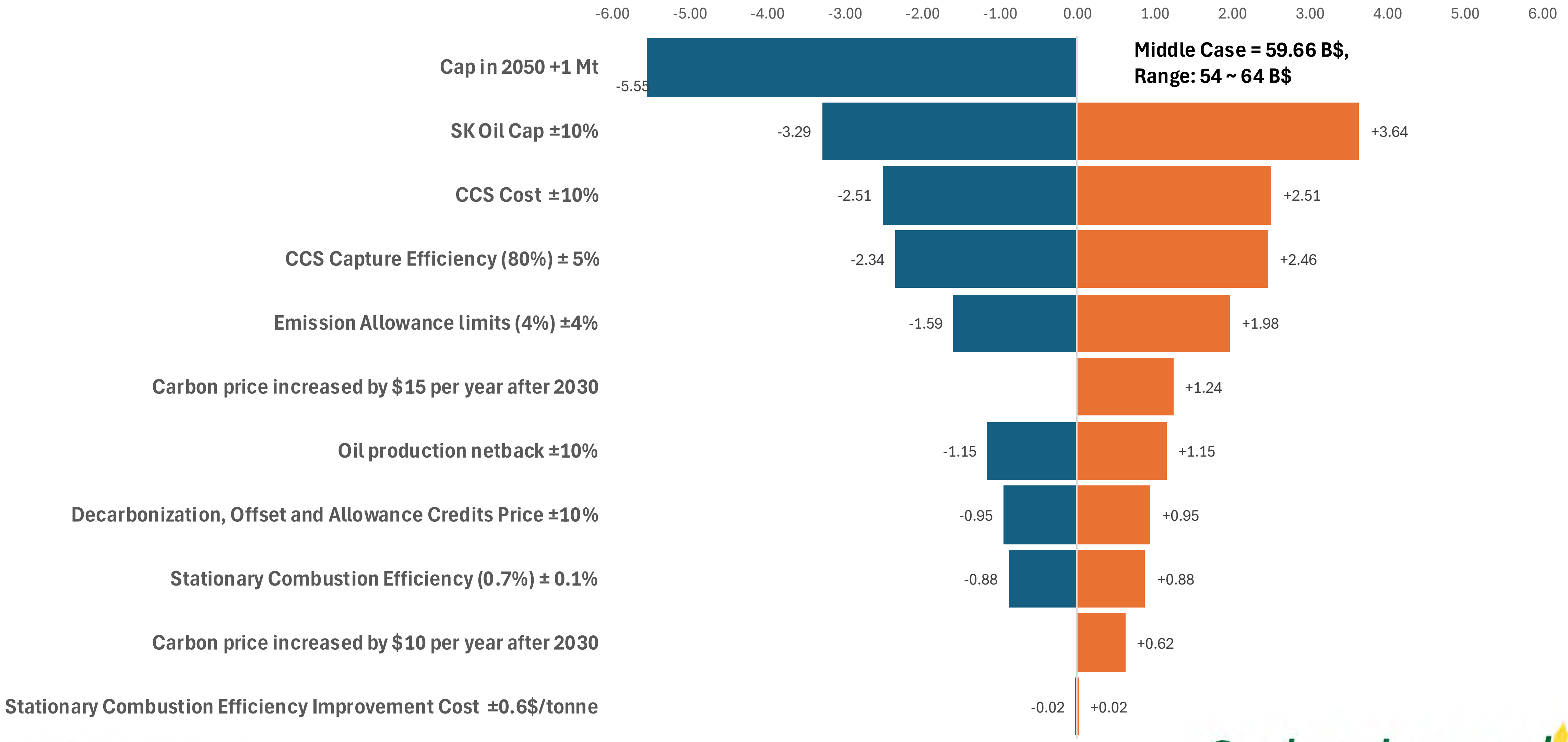
M75 and Emissions Cap Modelling: What Was Not Considered

- **Auctioning of Emissions Allowances:** The federal Regulatory Framework contemplates auctioning emissions allowances in future compliance periods. This would increase the compliance costs of the Emissions Cap overall.

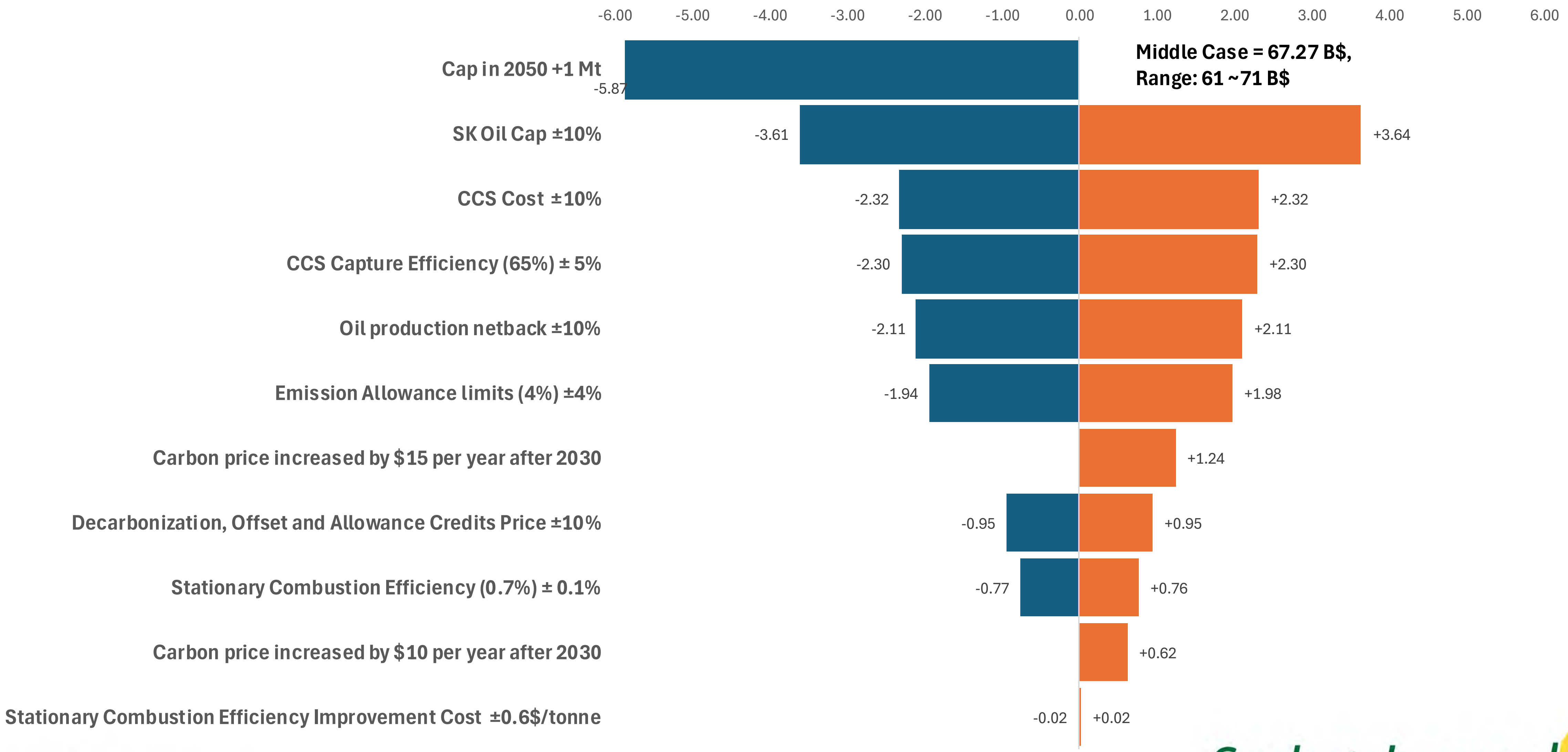
- **Economic Impacts of Investment in Emissions Abatement:** ER's analysis did not directly consider the economic benefits associated with investment in emissions abatement. This includes:
  - Investment and associated economic activity with installation of methane abatement solutions; and
  - Investment and associated economic activity with construction and operation of CCUS facilities.

- **Broader Government Revenues:** ER's analysis focused on direct government revenues of the oil and gas sector. Other significant sources include:
  - Land sale revenues and surface lease rentals;
  - Provincial Sales Tax and corporate/personal income taxes that rely on the oil and gas sector;
  - Crown Corporation dividends, for which the oil and gas sector is a major customer base.

Sensitivity under Scenario 1 – High CCUS



Sensitivity under Scenario 2 – Lower CCUS



SCHEDULE 9
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

MINISTRY OF ENERGY AND RESOURCES SLIDES
DATED AUGUST, 2024

Supplemental Slides: Economic Impact Assessment Tribunal Submission

Ministry of Energy and Resources
August 2024

Impacts to Freehold Mineral Owners

- Saskatchewan’s oil producing regions host significant freehold, or privately owned, mineral rights;

- Currently, roughly 35% of Saskatchewan’s oil production occurs on freehold mineral lands, providing significant benefits to mineral owners;

- Assuming a flat 15% royalty rate for freehold mineral owners, and using the same methodology that was used to estimate Crown royalty/tax impacts, the analysis suggests the following impacts to revenues for freehold mineral owners:*

- **In 2030: $136M (17%) - $154M (20%);**
- **In 2040: $102M (11%) - $210M (23%); and**
- **In 2050: $410M (39%) - $543M (52%).**

Impacts to Rural Municipalities

- 153 RMs generate property tax revenues from oil and gas properties (over 50% of all RMs);

- 62 RMs report that oil and gas properties represent over 10% of taxable assessments. The impact on total property tax revenues in these RMs is greater than 10% because higher mill rates are typically assigned to the industrial/resource property class;*

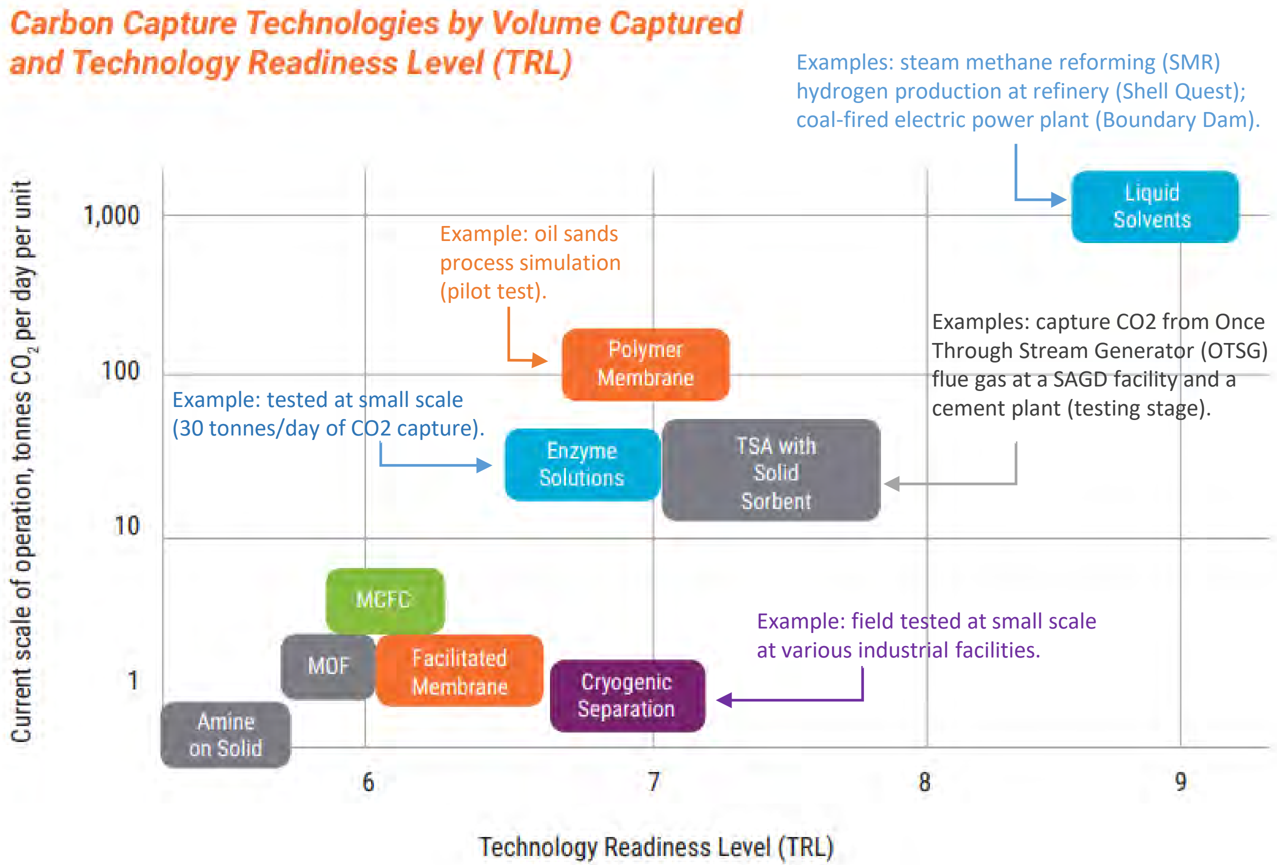
- It is estimated that 34 RMs receive more than 33% of total property tax revenues from the oil and gas industry, with some greater than 70%;

- It is estimated that in 2023, between $50M and $60M in Education Property Tax (EPT), and an additional $80M to $90M in municipal tax, was collected by RMs from the oil and gas sector;**

- Production impacts on the scale identified in the analysis would have significant impacts on RM property tax revenues, particularly in those RMs with concentrated levels of oil and gas activity.

Technology Readiness Level (TRL) of CCUS Application

- CCUS deployment in Saskatchewan under the emissions cap would occur at high CO2 concentration flue gas upgrading facilities (successful commercial scale demonstration) and at low CO2 concentration flue gas SAGD facilities (no successful commercial scale demonstration).*



Source: [Alberta Innovates (2022)]

- While CCUS application to upgrading facilities is technically mature (e.g., [Shell Quest project] to Scotford Upgrader), economic feasibility is determined on a facility-by-facility basis (incentives and subsidies are required).**
- [Alberta Innovates] funded a demonstration CCUS project on a large-scale SAGD facility. The operation was deemed unreliable due to process and mechanical issues but was deemed close to TRL 9 (i.e. “close to extensive implementation”).***
- To date, only Strathcona is doing front end engineering and design (FEED) studies for CCS on SAGD facilities in AB and SK at a commercial scale (not in operational stage yet).****

Impacts to Indigenous Communities

- The Ministry of Energy and Resources estimates in 2023, 14,250 barrels of oil per day were produced on First Nations’ mineral lands owned and administered by the federal government;*

- The value of production on these First Nations’ mineral lands in 2023 totaled $330 million;

- As of June 2024, 13% (2,900) of people employed directly in the oil, gas, and mining sectors in Saskatchewan identified as Indigenous;**

- Production impacts at the scale identified in the analysis would have significant impacts on Indigenous communities and peoples.

SCHEDULE 10
TO THE REPORT OF THE ECONOMIC IMPACT ASSESSMENT TRIBUNAL ON THE METHANE 75 AND GAS CAP

SEPTEMBER 03, 2024

A NOTE ON THE ECONOMIC IMPACT OF THE FEDERAL OIL AND GAS CAP AND METHANE REGULATIONS ON THE SASKATCHEWAN ECONOMY, DATED AUGUST 27, 2024

A Note on the Economic Impact of the Federal Oil and Gas Cap and Methane Regulations on the Saskatchewan Economy

by

Jack M. Mintz
School of Public Policy
University of Calgary

August 27, 2024

I have been asked to provide an assessment of the impact of the federal oil and gas GHG emissions cap and methane regulations on the Saskatchewan economy based on a review of two studies by Navius Research (hereafter "Navius") and the Conference Board of Canada (hereafter "Conference Board") undertaken for this purpose.[1] The assessment is based on the results derived from two models characterizing the Saskatchewan economy from 2025 to 2050. This is not an easy task. Making predictions over a rather long period is nearly impossible when many economic and geo-political factors change, thereby having a large impact on predictions.[2] One can only do their best allowing for sophisticated sensitivity analysis.

The main point of my analysis is that the Conference Board of Canada and Navius studies, both competently done in their frameworks, likely underestimate the impact of the oil and gas cap and methane regulations on the Saskatchewan economy for reasons I state below. This economic loss is unwarranted. While oil and gas production will fall sharply in Saskatchewan, it will shift to other parts of the world. Should that happen, global emissions will be unaffected (or even higher if production shifts to locations where environmental standards are lax). The result is pain for Saskatchewan with little benefit to the world in reducing emissions.

In this note, I will provide an overview and general assessment of the main conclusions derived by the models with regard to economic impacts on oil and gas production, GDP, investment, employment and government revenues by the Conference Board and Navius models. I will also provide some reflections on some issues that go beyond the studies themselves.

Primary Economic Conclusions of the Two Studies

The Conference Board uses a macro-economic model to assess the impact of the two regulations on Saskatchewan's economy in terms of GDP, investment, employment and government revenues. Similarly, the Navius study focuses on these same economic variables using a General Equilibrium model by specifying household preferences for consumption goods and services and firm production technologies using labour, capital, and energy to produce goods and service for domestic and export consumption. These are two quite different modelling approaches in assessing economic impacts.

---

[1] These two studies include Navius Research, "A Study to Review the Economic Impact of the Oil and GAS Sector Greenhouse Gas Emissions Cap and Enhance Oil and Gas Methane Regulations on Saskatchewan, August 8, 2024, and Conference Board of Canada, "Economic Impact of a Greenhouse Gas Emissions Cap and Methane 75 on the Saskatchewan Economy" August, 2024.

[2] My favourite example is thinking about 1913. At that time, no one would have predicted two world wars and major depression in the next 30 years. Forecasters are therefore humble about their predictions since so many economic and geo-political factors can significantly impact developments. For this reason, I tend to focus more on nearer term impacts such as those in 2030 rather than 2050.

The macro-economic model, typically used for short term forecasting, is a workhorse to understand the evolution of the economy that typically characterized by some unemployment in labour markets. It is based on a Keynsian approach with frictional and structural unemployment in labour markets that do not clear at the prevailing wage. The GE model assumes that relative prices are determined at which demand for a good or service equals its supply. GE models allow for the substitution of goods and services and inputs in production, which is important in deriving price effects on demand and supplies. Typically, the economy's resources are fully used and markets clear. [3]

After reviewing the papers, the most interesting question that strikes me are the size and differences in economic impacts specifically related to Saskatchewan's oil and gas production, GDP, investment, employment and government revenues. For comparison purposes, I use the Conference Board declining oil and gas emissions cap with Navius' model. This comparison is provided in the Table I below.

Table 1: Impact of Methane and Oil and Gas Emissions Cap on the Saskatchewan Economy

	Navius Report	**Conference Board of Canada**
	Impact in 2030	***Impact in 2030****
Oil and Gas Production	-3%	-232 bpd (-41%)
Investment	+0.4B	-$1.7B
Employment	-100	-17k (-2.6%)
GDP	-0.1%	-$8.9B (-6.7%)
Government Revenues	-$1.3B	-$1.4B (-5.4%)
	Impact in 2050	***Impact in 2050***
Oil and Gas Production	-38%	-244 bpd (-44%)
Investment	-$3.6B	-$2.2B (-8.8%)
Employment	-3k	-29k (-3.9%)
GDP	-3.1%	-$10.9B (-7.0%)
Government Revenues	-$1.3B	-$2.0B (-6.3%)

*Assumes the Conference Board scenario that fthe federal regulation requires a declining cap after 2030 for oil and gas emissions to fall to net zero. This is more comparable with Navius that assumes emissions under the cap fall by 91% by 2050. Conference Board estimates based on 2023 dollars. Navius estimates are based on 2023 dollars except for GDP impacts which are measured in 2015 dollars.

[3] If there is unemployment or underconsumption of goods and services, markets do not clear at a price or wage (both may hold). This requires a "general disequilibrium" model for analysis. See, for example, Jacques H. Drèze. 1987. "Underemployment Equilibria: From Theory to Econometrics and Policy" [First Congress of the European Economics Association Presidential Address] *European Economic Review*, 31: 9—34. Navius uses a wage/unemployment tradeoff equation in their model, but it is not the same as a general disequilibrium model which is more complicated.

Most striking, the Navius predictions on economic impacts are considerably lower than the Conference Board's in 2030 as the latter assumes a more immediate impact of the oil and gas cap on production, investment and employment. The Conference Board estimates GDP declines by $8.9 billon in 2030 (all values in 2023 dollars). Each year afterwards, GDP falls by 7% ($10.9 billion) as shown for 2050 (the cumulative decline in real GDP from 2030 to 2050 is $230 billion Navius (using 2015 values for GDP and 2023 dollars for other variables) predicts virtually no change in GDP for 2030 and 3.1% decline in GDP for 2050 with a cumulative decline of $35.8 billion. There are many factors that would explain these differences given the modelling approaches. Here, I will specifically focus on compliance costs associated with the methane and oil and gas emissions regulations.

The Conference Board argues that the methane regulation and oil and gas emissions cap will require production to decline by 41% under the declining cap scenario (232 kbd). Underlying their model are the assumptions that carbon emission-reducing technologies are unknown in application and therefore do not affect compliance costs.

Similar to the Conference Board, Navius models compliance with a reduction of 60 percent in Saskatchewan methane under a declining cap scenario. Navius, on the other hand, assumes a faster adoption profile for CCUS. In fact, methane compliance and CCUS adoption will be sufficient to avoid any meaningful oil and gas production cuts in 2030. Therefore, GDP and employment hardly changes, and investment slightly increases. After 2030, CCUS opportunities become less important resulting in a much bigger impact on production due to the oil and gas emission cut. By 2050, the impacts become more similar to those predicted by the Conference Board although noticeably smaller.

The major difference between the two reports is the path taken to comply with the regulations, which is reflected in compliance costs. From 2027 to 2030, the Conference Board estimates[4] cumulative compliance costs to be $2.3 billion (2023 dollars) under the methane regulation and $162 million in relation to oil and gas emission cap (largely satisfied by purchasing 3.25 Mt carbon credits at $50 per tonne). From 2031-50, cumulative direct compliance costs are $10.7 billion with a constant level of credits purchased at a constant cost of $50 per tonne each year.

The approach used by Navius to determine compliance costs is much more detailed. Navius' estimate of compliance costs is lower under the assumption that emission-reduction technologies and energy efficiency is implementable in various years. By 2030, most of the emission reduction will be satisfied by 60 percent compliance with the methane regulation and

[4] See Conference Board of Canada report, p. 10.

CCUS adoption. CCUS by 2030 is predicted to reduce Saskatchewan's emissions by a further 1.7 Mt, over four times more than current policy (0.4 Mt).[5] In 2023 dollars, compliance costs average $30.6 per tonne from 2026 to 2030 ($356 million per year) for a total cost $1.8 billion by 2030 (compared to $2.5 billion by the Conference Board).

After 2030, Navius assumes that the real marginal abatement cost rises from $148 in 2030 to $693 per tonne by 2050. The carbon price rises sufficiently to make CCUS commercially viable (reducing an additional 5 Mt in emissions over the 20-year period). Overall, compliance costs depend on the viability of different technologies like CCUS and direct air capture as well as the price of oil (a lower price results in lower production and lower compliance cost).[6] For example, in 2030, without CCUS, the Navius estimates the abatement cost at $559 per tonne that is more than three times the reference case of $170 per tonne. Between 2031 and 2051, compliance costs total $7.2 billion[7], two-thirds of compliance costs estimated by the Conference Board.

Given this background, it clear that the impacts depend crucially on several assumptions influencing compliance costs:

- Neither the Conference Board nor Navius are able to assess compliance costs on a site-by-site basis. A more detailed bottom-up approach would be warranted to determine the feasibility of technologies and the credits that might need to be purchased.

- The Conference Board assumes a $50 per tonne credit price in 2030 and thereafter. It is not clear where this value is obtained and why it is constant over time. For example, under Alberta's current TIER program, the current credit price is already $50 with an $80 carbon price.[8] Although it is a different market, it provides a floor to consider if an interprovincial trading scheme were to be implemented. As in Navius models, one would expect carbon and credit prices to rise as emission caps become more stringent. Thus, the Conference Board is likely underestimating compliance costs throughout the period.

- The adoption of CCUS depends on three factors: the carbon or abatement price, the value of carbon credits and any other income derived from using sequestered carbon (such as enhanced oil recovery). CCUS also depends on regulatory approvals, First Nation approval (and perhaps participation), operation and capital costs (including

[5] Navius report, p. 42.
[6] Ibid. p. 45.
[7] This estimate was provided by Saskatchewan Energy and Resources.
[8] See Carbon Price, https://carbon-pulse.com/256872/

construction costs and interest rates). These regulatory processes have been slow so far. For example, Alberta's Pathways carbon project has only recently applied for regulatory approval after two years since it was announced June 15, 2022. The investment decision still has not been approved by the participants given regulatory and some remaining federal and Alberta tax uncertainties. Alberta's Capital Power[9] decided to scrap its CCUS project altogether in part because of uncertainties over future carbon prices. Thus, CCUS may not be quickly adopted due to its expense. If so, as modelled by the Conference Board, the lack of CCUS deployment would result in larger losses in production, investment and employment.

Overall, I believe that compliance costs have been underestimated by both models but for different reasons. The Conference Board assumes too low of a credit price that is central to its forecasted compliance costs. Navius is too optimistic with CCUS adoption. Both did not have access to site-by-site data that would enable a bottoms-up approach to determining compliance costs.

Other Factors Suggesting Higher Economic Costs

Going beyond the models themselves, several other factors might suggest that the economic impacts of the methane regulation and the cap on oil and gas emissions would be larger than the two models show. Below, I will specifically discuss the openness of Saskatchewan's economy, dynamic modelling and expectations, and competitiveness.

Saskatchewan as Small Open Economy

Saskatchewan with GDP of $77 billion in 2023 accounts for less than 0.1 percent of the world economy. While it has some market power in product markets (uranium and potash), Saskatchewan is by and large a price taker in oil and gas markets, agriculture commodities (except perhaps canola – 23% of world production) and other commodities. Both reports assume that Saskatchewan is a price take in oil markets -- thus, oil prices are therefore unaffected by Saskatchewan production levels. Further, Saskatchewan's population of 1.2 million is roughly 2.5 percent of Canada's population, which implications for wage setting in Saskatchewan.

For this reason, a model based on the national or global economy is quite inappropriate to use for small open region such as Saskatchewan. Capital is highly mobile internationally –

[9] See https://globalnews.ca/news/10463652/capital-power-genesee-carbon-capture/.

investment and saving decisions in Saskatchewan would have no precipitable impact on the interest rate or the cost of equity and debt finance for investment. Thus, a regional model should assume that interest rates and the cost of financing will be unaffected by the methane and oil and gas emissions cap. If the regulations or taxes result in a reduction in the demand for capital or an increase in supply in Saskatchewan, capital exports will increase, and imports would fall at the prevailing international price.

As for labour, people are less mobile internationally due to immigration laws but are willing to move to other parts of Canada (any stickiness in labour mobility is due to culture, community and family ties). Thus, a regional model should include a migration constraint whereby the population moves if Saskatchewan's wage or per capita income falls relative to other provinces.

Why does this matter? In the extreme case, suppose capital is fixed in supply in a closed economy (an assumption often used in U.S. studies). If the methane and oil and gas emissions cap are implemented, it increases the cost of energy. This will drive down the demand for capital resulting in a decline in the interest rate. While the cap will hurt oil and gas production, it will be offset by increased in production in agriculture, manufacturing and service sectors that benefit from a lower cost of capital.

Since Saskatchewan is a small open economy, a much different scenario evolves. The increase in energy costs will cause capital demand to fall as in the previous case. However, instead of the interest rate falling the fall, capital imports will decline or more capital will be exported abroad. Other industries in Saskatchewan will not benefit from a lower cost of capital. Therefore, a policy that raises energy costs will have a more negative impact on Saskatchewan's economy as a small open economy compared to one that is not as open.

A similar point can be made about labour markets in a small open economy. If a policy shock results in lower demand for labour in oil and gas, employees will move to other provinces (or perhaps the United States if they are able to migrate). The wage rate will not adjust downwards (or much less than in an economy with no interprovincial labour flows). Other businesses will not benefit from lower wages. The impact on employment will be much greater as Saskatchewan would depopulate.

Assuming a small open economy, I would expect that the methane regulation and oil and gas emission cap would have a much larger impact compared to models which assume no interprovincial labour flows and international capital flows at an international determined cost of capital.

Dynamic Effects

Investment decisions clearly depend on expected demand for products, prices, interest rates, the cost of capital and government tax and regulatory policies. In a myopic model, investors only focus on current or near-term economic conditions. In a dynamic model, "rational" investors are concerned not just about near-term considerations but future ones for an extended period of time especially in capital-intensive industries like oil and gas. The dynamic model is typically more difficult to develop since it requires a formulation of expectations over prices and policies over the relevant time period.

A policy shock has quite different implications depending on whether expectations are myopic or rational. For example, oil and gas emissions cap that eventually falls to zero net emissions in 2050 may have little effect on investment in 2030 if investors discount policies in the future. However, rational investors may decide not to invest in long-term projects in 2030 if they are no longer viable after a short period. To the degree that future polices are believed to highly stringent in later years, it will have a larger impact on investment before 2030 than would be modelled with myopic expectations.

As the Navius report points out, future oil prices are highly relevant in assessing the effects of the methane and oil and gas emissions cap. In the next twenty-five years, a major shift to decarbonize the world economy could lead to a substantial decline in demand for oil and gas. This would mean sharply lower oil prices and much less production (the oil and gas emissions cap would be less important and perhaps redundant altogether). However, with rational investors, anticipated sharp declines in future oil prices will not only reduce future production but also investment in years before 2030. The Conference Board has a pretty hefty impact of oil and gas emission caps in 2030. That might be realistic if it is result of companies reducing investment in earlier years because of the declining cap. We have already seen this in the oil patch. Investment has declined to sustaining levels with few new greenfield investments especially in the oil sands.

Of course, this is one prediction. The other is that demand for oil and gas products may hold its own as populations and incomes continue to grow especially in non-OECD economies. If investment in new oil and gas greenfield projects fail to keep up with demand, prices might even strengthen. If so, oil prices will be higher and Saskatchewan production may continue to grow. The cap will therefore have a stronger impact under this scenario. These uncertainties in predicting both economic and policy decisions are typically left to scenario modelling using an assessment of probabilities applied to each scenario.

Carbon Policies and Competitiveness

Tax and regulations can hurt the competitiveness of companies and their willing to invest, hire workers and contractors. In economic terms, businesses expand production so long as the price (or incremental revenue) is at least as great the incremental cost incurred by adding on more unit of output.[10] The same applies to investment where investment is undertaken until the return on capital is equal to the cost of capital. Labour and other inputs are hired so long as the return generated on the last unit is equal to the input cost.

Governments impose taxes on capital (i.e. corporate income taxes, capital and property taxes, sales taxes on capital purchases), payroll taxes on employee compensation, fuel and carbon taxes on energy use and production taxes like royalties. Fuel excise and carbon taxes increase the cost of using energy in production just like corporate income taxes and sales taxes on capital purchases increase the cost of using capital. Aggregating these taxes, one can calculate an effective tax rate on the cost of doing business. For example, if it the annualized cost of producing a barrel of oil is $30 without taxes and $40 with taxes, the effective tax rate on costs is 33 percent ($10/$30).

In some recent work[11], I have been analyzing the impact of carbon and fuel taxes on the cost of doing business that affects all industries that use energy as an input. This work has not yet incorporated regulations like the low-carbon fuel regulation and oil and gas emission cap. As Navius points out, oil and gas emission cap adds to the cost of doing business (they use a Canada Climate Change and Environment estimate of $50 a tonne that is assumed constant over the two decades).[12] Given producers would not be able to shift forward the cost to consumers due to import competition, one would expect companies would have to reduce their production, investment and employment instead.

Most models including that of the Conference Board and Navius are based on the characterization of output, investment, employment and energy input decisions made by profit-maximizing firms. Some explicitly include some but not all tax variables that affect input costs like the corporate income tax. Some do not include taxes at all because of the complexities involved (such as the Navius model).

---

[10] The higher the effective tax, the less output produced by firm (and less investment and employment). This discussion is based on K. McKenzie, J. Mintz and K. Scharf, "The Measuring Effective Tax Rate in the Presence of Multiple Inputs: A Production-Based Approach", *International Tax and Public Finance*, Vol 4 (3), 1997, 337 - 360.

[11] This discussion is based P. Bazel and J. Mintz, 'Impact of Carbon Policies on Competitiveness in Oil and Gas: An Alberta-U.S. Comparison", February 2024.

[12] Navius Report, p. 42.

But what about the decision to employ capital, labour and energy in technologies that reduce emissions like CCUS. How should these decisions be modelled? CCUS investments should be modelled like other investments as a profit-maximizing decision. The income earned by reducing emissions are savings in carbon tax payments, income from selling credits and other income resulting from sequestered carbon. Under the corporate income tax, the carbon tax payments are deductible from profits and the carbon credit sales and are income are taxable. Costs are deductible and CCUS investment tax credits and accelerated depreciation reduce the cost of capital.

Companies will invest in CCUS if the returns cover the cost of capital adjusted for taxes. Otherwise, they will not invest as we have seen with Capital Power in Alberta. The cost of employing CCUS includes not just capital and operating costs but also taxes. If the carbon tax rate is rising over time, energy costs will rise as an operating cost. Higher carbon tax payments will also increase the benefits from investing in CCUS. On the other hand, the oil and gas cap reduces production that will also result in lower carbon tax payments, thereby reducing the incentive to employ CCUS.

The upshot is that a more precise modelling of emission-reducing activities by companies is required to understand CCUS policy impacts on the economy and government revenues. Carbon taxes and regulations increase production costs while CCUS subsidies lower them. The net effect is to raise costs and reduce production and investment. Without explicit modelling of CCUS investment, one cannot determine whether it would be undertaken or not.

Leakage of Production to Other Countries

Competitiveness raises other issues particularly the shift of production in Saskatchewan to other jurisdictions, particularly the United States, Latin America and OPEC countries. There are good reasons to believe that many Saskatchewan businesses may lose competitiveness to the U.S. because of the overall impact of carbon policies including the methane and oil and gas emission cap regulations.

Currently, Canada and the United States are out of sync with respect to carbon policies. Canada relies on both carrots and sticks to incent the adoption of clean energy technologies. Carbon prices are rising to $170 per tonne by 2030. The clean fuel standard, various mandates, methane regulation, and oil and gas emissions cap have added costs in the policy mix. Both tax and regulatory costs are offset by significant subsidies and tax credits for clean energy and emission-reducing technologies.

Unlike Canada, the U.S. is avoiding carbon pricing sticks and using subsidy carrots to decarbonize the economy. Excluding California and few states, the U.S. does not have carbon taxes or emission trading systems. However, with the Inflation Reduction Act, the U.S. is heavily subsidizing clean energy and emission-reducing technologies like CCUS and direct air capture. Environment Protection Agency regulations and various mandates also add to the costs of doing business in the United States.

In terms of competitiveness, Canada's carbon pricing and regulations are raising energy costs while both Canada and U.S. are using subsidies to support technologies including CCUS. Even if Canada matches U.S. subsidies for clean energy technologies, carbon pricing and regulations make production less competitive with higher energy costs. If this divergence in policies remain, the effect will be to shift not just oil and gas production to the U.S. market but, through higher energy costs, manufacturing and service sectors as well. Even if Canada imposed carbon tariffs on U.S. goods entering Canada, it will not help Canadians and Saskatchewan exports to compete in the United States.

As part of the assessment of the methane and oil and gas emission cap regulations, Saskatchewan's trade balance with U.S. and other countries should be considered in more detail. Leakage of production to other parts of the world should also be a concern to the Tribunal. If production moves to other jurisdictions, Saskatchewan's economy would be hurt without leading to a fall in worldwide emissions. If countries do successfully reduce emissions worldwide, global oil prices would fall, potentially having a much greater impact on emissions in Saskatchewan than the cap, which could become redundant in the long run.

Conclusions

The two reports prepared for the Tribunal are important in assessing the impact of the methane and emission cap regulations on the oil and gas sector and the Saskatchewan economy. They use quite different models. The Conference Board report is a Keynesian-based macro-economic model with excess supply of labour (unemployment). The Navius report uses a General Equilibrium model with markets clearing at relative prices. The Navius reports suggests that the methane regulation and oil and gas emission cap will have little impact on the Saskatchewan economy in 2030 and a more significant impact by 2050. On the other hand, the Conference Board of Canada suggests a much larger effect on Saskatchewan's economy by 2030 as well as a bigger impact by 2050 under a similar declining cap scenario that was assumed in the Navius report.

In my view, both reports may underestimate the long run impacts for the following reasons:

- Compliance costs are underestimated due to a low credit rate used by the Conference Board and optimistic adoption of CCUS in the Navius report.
- Neither Navius nor the Conference Board had access to site-by-site data, which would be better to use to evaluate compliance costs.
- A regional model with an internationally determined interest rate for the cost of capital and migration flows with other provinces would yield larger impacts.
- Dynamic modelling with rational investors anticipating the decline in caps would have a larger impact on investment by 2030.
- Investments in production-related capital and emission-reducing technologies should be modelled explicitly taking into account interactions with carbon taxes, corporate taxes and incentives. Once doing so, the emissions cap would not only affect production-related investment but also deter CCUS investment.
- The differences in carbon policy approaches between Canada and the United States would result in potentially larger shifts in production to the United States for competitiveness reasons.