

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Canadian Natural is one of the largest independent crude oil and natural gas producers in the world. We have an effective and efficient, diversified combination of assets in North America, the UK portion of the North Sea and Offshore Africa, which enables us to generate significant value.

Our balanced portfolio of light, synthetic, and heavy crude oil and natural gas represents one of the strongest and most diverse asset portfolios of any energy producer in the world. Our financial discipline, commitment to a strong balance sheet, and capacity to internally generate cash flows provide us the means to responsibly and sustainably grow our Company in the long term.

At Canadian Natural, we are committed to conducting our business in a way that embraces the key piece of our mission statement "doing it right". Environmental stewardship is a fundamental value of our company and this is reflected in our approach to energy development. Our goal is to develop resources in a sustainable and responsible way. We are committed to managing and minimizing the environmental impacts of our operations during all phases of our projects. To reach high standards of environmental performance and achieve regulatory compliance, we adhere to the principles of continuous improvement, efficient operations and technological innovation.

Our Environment team works together with management and all our operating divisions to ensure environmental stewardship is factored into our decision-making process. Through our Environmental Excellence program, we work together to proactively reduce greenhouse gas (GHG) emissions, minimize habitat disturbance and advance reclamation, minimize the impact on the landscape to conserve high-value biodiversity and wildlife, and reduce fresh water use. We foster a culture of environmental awareness where everyone has a vital role to play in identifying and mitigating environmental impacts from our operations. We reinforce environmental excellence through employee training, due diligence and the communication of environmental priorities.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1 2019	December 31 2019	No	<Not Applicable>

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

- Canada
- Côte d'Ivoire
- United Kingdom of Great Britain and Northern Ireland

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

CAD

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Other, please specify (Reporting the net Canadian Natural equity share of facilities we have operational control over.)

C-OG0.7

(C-OG0.7) Which part of the oil and gas value chain and other areas does your organization operate in?

Row 1

Oil and gas value chain

Upstream

Other divisions

Carbon capture and storage/utilization

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Director on board	The Board of Directors is responsible for overseeing and ensuring the Management Committee (MC) has appropriate and effective measures in place to create and execute its strategies, including management of climate-related issues. The Board brings a mix of experience and knowledge gained through senior level positions held in the public and private sectors such as oil and natural gas, energy storage solutions, technology, legal, finance, and health, where leadership and governance over sustainability matters have been a longstanding priority. Seven Directors of the Board have relevant experience in climate change, eight Directors have relevant experience in health, safety and environment, and 11 Directors have relevant experience in risk management. The Directors oversee and monitor company-wide efforts to support, manage and improve our performance, and ensure the effectiveness of our sustainability programs, including climate related issues. Specifically, Directors on the Health, Safety, Asset Integrity and Environment (HSAI&E) Committee of the Board receive quarterly updates from the Environment, Social, and Governance (ESG) Committee, a select group of the MC. Directors are part of the reporting process and are responsible for monitoring implementation of our sustainability programs, including review and approval of internal stewardship reports about objectives, performance, key performance indicators, and actions undertaken to mitigate risk. In 2019, detailed presentations to the Board were provided by Management, including a review of the company's: Environmental Stewardship Report and key developments anticipated in 2020; and management of environmental risks including GHG emissions/climate change and the role of innovation to address and continuously improve environmental stewardship and performance. In addition, the Board, through the Directors on the Compensation Committee, focus on aligning executive pay for performance, assessing the Corporation's performance under set categories which includes sustainability metrics related to safety, asset integrity and environmental performance. Performance is evaluated against a specific target performance range and/or a benchmark determined by prior period performance. For example, the corporate GHG emissions intensity annual target range for 2019 is 0.048 – 0.058 tonnes/BOE to drive continuous performance.

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – some meetings	<ul style="list-style-type: none"> Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues 	<Not Applicable>	Canadian Natural's Health, Safety, Asset Integrity and Environmental Committee (HSAI&E) of the Board of Directors meets every quarter to discuss sustainability matters, review internal stewardship reports about objectives, performance and key performance indicators and targets, and actions and initiatives undertaken to mitigate climate related risk. The Directors in the HSAI&E Committee oversee and monitor company-wide efforts to support, manage and improve our performance, and ensure the effectiveness of our sustainability programs, including health, safety, asset integrity, environmental risk and social initiatives. The Health and Safety, Asset Integrity, Environment, Stakeholder Relations and Community Investment groups report on a regular basis to Senior Management in the Environment, Social, and Governance (ESG) Committee, who in turn provide updates to the HSAI&E Committee of the Board. Progress is tracked regularly and shared across all levels of employees, including targets. The Board of Directors has responsibility for overseeing and ensuring that Management Committee has appropriate sustainability programs in place, including the identification of climate-related risks and opportunities, and their implications for our business strategies across Canadian Natural. The Board of Directors provides expertise and oversight on specific ESG factors, through the roles and responsibilities of the following Board committees: <ul style="list-style-type: none"> • Nominating, Governance and Risk Committee – Corporate governance practices and the management of enterprise risk exposure. • Health, Safety, Asset Integrity and Environment Committee – Occupational and process safety, asset integrity, environmental stewardship, regulatory, risk management, sustainability and social initiatives. Processes for identifying, assessing, and managing climate-related issues are integrated into our Enterprise Risk Management (ERM) framework. The Nominating, Governance and Risk Committee of the Board reviews and monitors the status of ERM activities, including climate-related regulatory and operational risks, and the steps Management has taken to implement mitigating actions. Performance results are reported internally through a management review process and externally through the annual sustainability report. Annual performance objectives and targets are tracked and corporate status reports are presented quarterly to senior management and Board of Directors.

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
President	<Not Applicable>	Both assessing and managing climate-related risks and opportunities	<Not Applicable>	Quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Our Corporate Management Committee, a group of Canadian Natural's senior executives who share the responsibilities normally associated with a Chief Executive Officer position, reviews and approves decisions on climate-related issues. Two members of the Management Committee are also Directors of the Company — the Executive Chair and the President. In 2019, the former Executive Vice-Chair was also on the Management Committee and Board of Directors.

The President and our Management Committee (MC) are responsible for the identification, assessment and management of climate change related risks and opportunities material to our industry and company. The President leads our ESG Committee, a sub-group of the Management Committee (MC), and is responsible for providing direction and guidance on climate-related issues. The ESG committee consists of our President, Chief Operating Officers (COOs) and Senior VPs and VPs representing Health, Safety, Asset Integrity, Environment, Operations, Finance, and Technology. Collectively, these individuals have the relevant expertise in their areas and play a critical role in the timely identification, assessment, monitoring and management of climate-related issues across our organization, including setting and reviewing targets. We monitor climate-related issues by tracking government policy development, monitoring peer company activity, reviewing independent external scenario analyses, and through discussions with investors.

The ESG Committee monitors and reports on climate-related issues to the MC and Board of Directors on a quarterly and annual basis, including sustainability performance, key indicators, targets and actions taken to mitigate risks. The Board of Directors is responsible for overseeing and ensuring the President and Management Committee (including the ESG Committee) has appropriate sustainability programs in place, including the identification of climate-related risks and opportunities and their implications for our business strategies across Canadian Natural.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Canadian Natural's Performance Scorecard has 10% of performance measured against Safety, Asset Integrity and Environment KPIs with the goal of continuous improvement over the previous period. Our climate change-related KPIs include GHG Emissions Intensity (tonnes/BOE). Our executive compensation policies and procedures are centered on a pay-for-performance philosophy and aligned with the long term interests of our shareholders. Our compensation program is designed to: • Reward the creation of long-term shareholder value. • Reflect short-, mid- and long-term corporate performance. • Maintain an appropriate balance between base salary and short-term and long-term incentive opportunities, with a distinct emphasis on compensation that is "at risk". • Be competitive, so as to attract and retain talented individuals. • Encourage Common Share ownership by employees. • Align the pay-for-performance approach to executive compensation to the long-term interests of the shareholders.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
President	Monetary reward	Emissions reduction target	With the exception of Canadian Natural's Debt to Book metric, which has been established to reflect all commodity price cycles, we established 2019 performance targets as part of our 2019 budget guidance, which was released on December 5, 2018. The resulting performance measures are assigned weightings as indicated in the Performance Scorecard (available in our 2019 Management Information Circular) and the resulting overall score is utilized by the Compensation Committee to determine the performance bonus for the President. The cash bonus awarded is based on Canadian Natural's and the individual's performance over the year in contributing to the company meeting its yearly operating plans and its operating and financial goals as evidenced by corporate performance. Greenhouse gas emissions intensity (tonnes/BOE) is one metric in the corporate Performance Scorecard on which performance bonuses are based.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	3	
Medium-term	3	7	
Long-term	7	100	

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Given the dynamic nature of risk, Canadian Natural uses a multidisciplinary Enterprise Risk Management (ERM) framework to identify, assess, and mitigate risks that may affect the company and our operations. The ERM framework incorporates a matrix approach to risk assessment that categorizes and aligns risks across operational areas, allowing teams to better understand the identified risks, their impacts on our operations and the mitigation being undertaken to address these risks. This allows management to monitor potential risk exposures and the steps taken to address the identified risks, or otherwise mitigate these exposures by identifying the specific individuals on our Management Committee responsible for each of the identified risks. Reporting on the risks and related mitigating activity throughout Canadian Natural is also part of the ERM framework.

Summaries of corporate risk, including climate-related, regulatory and operational risks, are provided in the corporate enterprise risk register and reported to the Nominating, Governance and Risk Committee (NGRC) twice a year. To ensure proper accountability of risk, this semi-annual report includes an assessment of the inherent risk areas, mitigating action plans and the Board or Management Committees that have oversight and management responsibilities for each risk.

Our risk processes include an assessment of the significance and scope of identified existing and emerging climate-related risks. We use an Enterprise Risk Matrix to determine likelihood (probability) and impact of risks, and classify them as High, Moderate, or Low. A classification of 'High' would be considered a substantive financial or strategic impact to Canadian Natural's business. This process helps us prioritize climate-related risks and determine materiality.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term

Medium-term

Long-term

Description of process

Canadian Natural identifies, assesses and responds to climate-related risks and opportunities using a multidisciplinary risk management process, which considers climate change risks and opportunities as part of business evaluation. Processes for identifying, assessing, managing and responding to climate-related issues are integrated into our Enterprise Risk Management (ERM) framework. Our business strategy is influenced by incorporating knowledge of climate-related risks and opportunities, including current and potential policies and regulations, into decisions made by our Management Committee (MC) and Board of Directors. Risk is managed at all levels of our company, and several bodies take part in this governance approach: • Management Committee (MC) is responsible for the identification, assessment and management of climate change risks and opportunities. Business units identify and report on significant local risks and opportunities regularly. • MC, including the ESG Committee and the Greenhouse Gas (GHG) Operations Strategy Committee, provides direction and guidance to business units on climate-related risk assessment, carbon emissions management and project implementation. • ESG Committee provides internal stewardship reports to the HSAI&E Committee of the Board, reporting on sustainability performance, key indicators and actions taken to mitigate risks. • GHG Operations Strategy Committee is responsible for climate change strategy and issue prioritization. This Committee oversees our working groups that manage and coordinate GHG reduction and technology projects across the company, such as the cross-functional Methane Steering Committee. The GHG Committee also assesses and provides input on current and developing GHG policy and regulation. • Nominating, Governance and Risk Committee of the Board reviews and monitors the status of ERM activities, including climate-related regulatory and operational risks, and the steps Management has taken to implement mitigating actions. • HSAI&E Committee of the Board is responsible for ensuring that Management has effective design and implementation of sustainability and environmental risk management programs, including controls and reporting systems. • Board of Directors is responsible for overseeing and ensuring the Management Committee has appropriate and effective measures in place to manage climate-related risk. Climate change risk management also occurs at the asset level through recurring projects and reviews, as well as economic evaluations, including forecasting GHG intensity and compliance costs, and reviewing abatement projects. Internal quarterly management reviews are completed to monitor GHG emissions performance. As per regulatory requirements for specific facilities and/or jurisdictions where we operate, GHG emissions reports are submitted annually. Canadian Natural's associated environmental risk management strategies focus on stakeholder engagement and working with legislators and regulators to ensure that any new or revised policies, legislation or regulations properly reflect a balanced approach to sustainable development. Specific measures taken in response to existing or new legislation include focusing on our energy efficiency, air emissions management, released water quality, fresh water use reduction, and the minimization of the impact on the landscape to conserve high-value biodiversity. We have internal procedures designed to ensure that the environmental aspects of new acquisitions and new developments are taken into account prior to proceeding. In addition, Canadian Natural is working with relevant parties to ensure that new policies encourage technological innovation, energy efficiency, and targeted research and development while not impacting competitiveness. Canadian Natural provides ongoing reporting on how we are addressing climate and other environmental related financial and operational risks. Climate-related management of risks and opportunities is monitored every quarter, with risks assessed every six months or more frequently, considering risks that impact our business as far as 6+ years into the future. We review transition risk and physical climate risk. Physical climate change risks are mitigated by a combination of a geographically diverse production base and by our emergency response plans. For example, our Horizon oil sands operation may experience physical climate change risk in the form of more frequent forest fires or reduced ability to withdraw water from the Athabasca River due to low stream flows. The need to manage these risks was identified, with Canadian Natural addressing these risks by constructing a fire break (cleared area) around the Horizon site, and by constructing a water storage pond on site to ensure a supply of fresh water at times of low stream flow. The result is that the Horizon facility has not been damaged by forest fires nor been affected by water shortages. Transitional climate change risks are mitigated by our large, diversified and balanced portfolio which positions us to be resilient in a lower carbon emissions economy, consisting of long life, low decline assets representing a reserve life of 50 years. One specific transition risk is that customers may select against higher GHG intensity crude oils, which could reduce the value of that production. Our management response was to establish a corporate aspiration of net zero on our oil sands operations and a goal to reduce our oil sands GHG intensity by 25% by 2025 (2016 baseline). As part of a transition to lower-carbon emissions intensity production, Canadian Natural has assessed the intensity of current projects, and has developed technology pathways to reduce GHG intensity. For example, we are currently piloting the use of solvents at our Kirby South thermal oil sands operation, as a way to reduce steam use and GHG emissions per barrel of production.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Current and potential climate change policies and regulations are relevant because their impact are considered when making decisions to advance Canadian Natural's business strategy. For example, the new "Management and Reduction of Greenhouse Gases Act" in the province of Saskatchewan will impose a GHG cost on our operations in that province, which will increase our operating expense for assets in Saskatchewan, such as the Steelman conventional oil field.
Emerging regulation	Relevant, always included	An aspect of climate change risk that most influences Canadian Natural's business strategy is future compliance costs/regulatory changes. The costs of complying with environmental legislation in the future may have a material adverse effect on our financial condition. Current and potential climate change policies and regulations are considered when making decisions to advance our business strategy. For example, the development of the proposed federal Clean Fuel Standard may increase the cost of liquid and gaseous fuels, which would increase the operating cost for facilities such as our Oil Sands Mining and Upgrading operations.
Technology	Relevant, sometimes included	Canadian Natural works with relevant parties to ensure new policies encourage technological innovation, energy efficiency, and targeted research and development while not impacting competitiveness. Regulatory and policy changes to address climate change may require the development or adoption of new sustainable technologies to reduce environmental footprint and support the transition to a lower carbon emissions/energy efficient economy at significant cost. The risks to Canadian Natural are that the available technologies may not prove to be economic and there is potential execution risk in implementing new technologies, including when retrofitting into existing facilities. An example would be the deployment of solvent recovery technology at the Kirby South thermal facility. To address this risk, we continue to evaluate new technologies to reduce environmental impacts, including support for Canada's Oil Sands Innovation Alliance (COSIA), and Petroleum Technology Alliance Canada (PTAC).
Legal	Relevant, always included	Canadian Natural strives to carry out its activities in compliance with applicable regional, national and international regulations and industry standards. Environmental specialists in Canada and the UK track numerous environmental performance indicators, review the operations of our worldwide interests and report on a regular basis to senior management, who in turn reports on environmental matters directly to the Health, Safety, Asset Integrity and Environmental Committee of the Board of Directors. Canadian Natural regularly meets with, and submits to inspections by, the various governments in the regions where we operate. Our associated environmental risk management strategies focus on working with legislators and regulators to ensure that any new or revised policies, legislation or regulations properly reflect a balanced approach to sustainable development. For example, failure to meet the reporting requirements under the Alberta Specified Gas Reporting Regulation for facilities such as the Gold Creek Gas Plant would result in enforcement action, up to and including a \$500,000 fine for failure to report.
Market	Relevant, always included	Various jurisdictions have enacted or are evaluating low carbon fuel standards, which may affect access to market for crude oils with higher emissions intensity. Canadian Natural may be exposed to greater market risk for its products associated with the shift to a lower carbon emissions future. These risks may include increases in the demand for renewable energy sources, increases in compliance costs that may not be recoverable in the price of the product, which could delay the development of certain assets, and restricted access to markets for higher carbon intensive energy sources. This could result in a competitive disadvantage if producers in other jurisdictions are not subject to similar regulatory burdens. For example, Canadian Natural is evaluating and monitoring the Government of Canada's development of a proposed Clean Fuel Standard which may affect production and consumption of fuels in Canada. The impact of the proposed Clean Fuel Standard on the Oil Sands Mining and Upgrading Operations is estimated at CAD \$8-16 million dollars per year.
Reputation	Relevant, always included	Aspects of climate change risk that most influence Canadian Natural's business strategy are: future regulatory changes and associated compliance costs, commodity price, access to markets and capital, social preferences and reputational risk, and technology development. Changes in public support for climate action, combined with increased activism and opposition to fossil fuels, particularly to oil sands, may impact the market for our products and securities and impact its ability to obtain approvals for new projects and raise capital. For example, approximately 30% of our asset base in 2019 was in heavy crude oil production and this may limit interest for our shares among investors who are screening for producers who are weighted to light oil or natural gas production.
Acute physical	Relevant, always included	Canadian Natural manages for the risk of extreme weather events in its operations and emergency response plans. For example, the Asset Integrity Management System includes the impact of extreme rainfall or flooding events when assessing the risk and associated mitigation of pipeline river crossings. This is done to reduce the risk of a flooding event or slope failure leading to a pipeline failure and the potential release of product into the environment. Also, a comprehensive corporate Emergency Management program is in place to coordinate Canadian Natural's response to potential incidents (including extreme weather events). This program includes Emergency Response Plans (ERPs) intended to ensure a prompt initial response and efficient management and containment of situations as they arise.
Chronic physical	Relevant, sometimes included	Canadian Natural includes chronic, physical risks in its risk assessment process. For example, Canadian Natural evaluated the risk of reduced water flows in the Athabasca River and constructed additional water storage capacity at its Horizon Oil Sands Mining and Upgrading Operation in order to mitigate this risk. In the absence of a storage facility, the risk is that reduced water flows could result in lower water availability, which could cause reduced production at the Horizon facility.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Current regulation	Carbon pricing mechanisms
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Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Governments in jurisdictions where Canadian Natural operates have developed or are developing GHG regulations as part of their national and international climate change commitments. Canadian Natural considers existing GHG regulations to determine the impact of compliance costs on current and future projects. In 2019, the carbon price in: - British Columbia was \$35/tonne in Q1 and \$40/t for the remainder of 2019. It applied to all fuel gas and flare volumes at our BC facilities, and to gasoline, diesel, propane and other fuels. - Alberta was \$30/tonne and was applied to a portion of emissions from the following facilities: Horizon, Athabasca Oil Sands Project, Primrose/Wolf Lake in situ, Kirby South in situ, Jackfish in situ, Peace River in situ, Hays gas plant, Wapiti gas plant and the Brintnell power generation facility. - Saskatchewan was \$30/tonne and applied to all fuels (liquid and gaseous) from April 1. From September onward, pricing on emissions from gaseous fuels was transferred into the Saskatchewan "large emitter" system. - The UK is variable, since it is the market price of the European Union Allowances (EUA) which is the compliance vehicle for the European Trading System (ETS) which regulates our offshore North Sea oil production platforms. The EUA ranged from -€20 – €29/tonne in 2019 (CAD\$29.80 - \$43.21).

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

30

Potential financial impact figure – maximum (currency)

50

Explanation of financial impact figure

Potential financial impact is represented by the cost per tonne of CO2 applied per the applicable regulation.

Cost of response to risk

750000

Description of response and explanation of cost calculation

In Canada, Canadian Natural participates in both federal and provincially regulated climate and GHG emissions reporting programs and continues to quantify annual GHG emissions for internal reporting purposes to drive continuous improvement and reduction in GHG emissions intensity. We continue to expand our third party verification processes. For example, Canadian Natural has installed improved insulation on the incinerator stack at a natural gas plant in Northeast British Columbia during a 2019 maintenance shutdown. This was part of an overall initiative to reduce operating cost at this facility, including carbon tax expense. We were also able to use a government grant program that provided capital funding for emission reduction projects. This project will improve the energy efficiency of the incinerator and thereby reduce fuel gas use, reducing GHG emissions and carbon compliance costs. The \$750,000 cost to respond to the risk is attributed to the costs of contracting engineering firms for annual third party verification of reported GHG emissions, and internal calculation, reporting, and data record management for facility emissions.

Comment

No comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Acute physical	Increased likelihood and severity of wildfires
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Primary potential financial impact

Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

Many of Canadian Natural's facilities are in forested areas in British Columbia and Alberta where wildfires occur periodically. Examples are the Septimus Gas Plant in British Columbia and the Gold Creek Gas Plant and Brintnell Oil Battery in Alberta. Wildfires in the proximity of our facilities may cause loss of production due to facility shutdown, either directly because of risk to people, the facility, or because of impact to required infrastructure (e.g., pipeline facilities and power lines).

Time horizon

Short-term

Likelihood

Very likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

2400000

Potential financial impact figure – maximum (currency)

24000000

Explanation of financial impact figure

Estimate of lost production, estimated as 0.01% – 0.1% of 2019 revenue. Upper end is estimated as 5% of production being shut in for 7 days/year due to fire. Lower end is estimated as 0.5% of production being shut in for 5 days/year due to fire.

Cost of response to risk

200000

Description of response and explanation of cost calculation

For example, our Horizon oil sands operation may experience physical climate change risk in the form of more frequent forest fires or reduced ability to withdraw water from the Athabasca River due to low stream flows. The need to manage these risks was identified, and Canadian Natural addresses these risks by constructing a fire break (cleared area) around the Horizon site, and by constructing a water storage pond on the site to ensure a supply of fresh water at times of low stream flow. The results of this is that the Horizon facility has not been damaged by forest fires nor been affected by water shortages. \$200,000 are the estimated operational costs to maintain normal fire breaks at Horizon, based on previous activities.

Comment

No comment

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Chronic physical	Changes in precipitation patterns and extreme variability in weather patterns
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Primary potential financial impact

Decreased revenues due to reduced production capacity

Climate risk type mapped to traditional financial services industry risk classification

<Not Applicable>

Company-specific description

For example, Canadian Natural's Horizon oil sands facility relies on water from the Athabasca River as part of the production process. The water is used for extraction of bitumen from oil sands ore and for the production of hydrogen, which is used in the upgrading process. In times of low flows in the Athabasca River, the Horizon facility may be limited in the volume of water it is allowed to withdraw from the Athabasca. We mitigate this risk by having 30 days of water storage on site.

Time horizon

Short-term

Likelihood

Likely

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

<Not Applicable>

Potential financial impact figure – minimum (currency)

409000000

Potential financial impact figure – maximum (currency)

500000000

Explanation of financial impact figure

If Canadian Natural did not have 30 days of water storage on site, there would a potential financial impact on production for 30 days. Potential financial impact is calculated as 30 days production x daily assumed production rate of 200,000 bbl/d x average 2019 sales price (CAD\$75/bbl) with +/-10% for range.

Cost of response to risk

9400000

Description of response and explanation of cost calculation

For example, in times of reduced water flows in the Athabasca River due to weather events, Canadian Natural may be limited in the volume of water it is allowed to withdraw from the Athabasca. This could result in reduced production at the Horizon Oil Sands Mining and Upgrading operations. We evaluated this risk and as a result, built additional 30-day water storage capacity at Horizon to allow for continued operations at normal production rates during periods of reduced flows in the Athabasca River. \$9.4 million represents the capital spent to build water storage capacity at Horizon.

Comment

No comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

Canadian Natural is a leader in the oil and natural gas industry in CCS projects, with a carbon capture capacity of 1.5 million tonnes at our Oil Sands Mining and Upgrading operations – including CO2 capture and sequestration facilities at Horizon and a 70% interest in the Quest CCS facilities at Scotford. These initiatives combined with CO2 capture at our Hays Gas Plant for use in enhanced oil recovery and a 50% stake in the North West Redwater Sturgeon Refinery, have a total capture capacity of 2.7 million tonnes/year of CO2, making Canadian Natural the sixth largest owner of CCS capacity in the global oil and gas sector, based on data from the Global Carbon Capture and Storage Institute.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

32000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

1.19 million tonnes of GHG offset credits earned by the Quest CCS project (net to Canadian Natural) multiplied by offset value of \$27/tonne. Financial impact is calculated as Canadian Natural's share of GHG offset credits earned at Quest, multiplied by the government carbon price.

Cost to realize opportunity

790000000

Strategy to realize opportunity and explanation of cost calculation

Quest Carbon Capture and Storage (CCS) project is part of the Athabasca Oil Sands Project (AOSP), of which, Canadian Natural has 70% ownership interest. CO2 is captured from the hydrogen plant at the Scotford upgrader, and then compressed and transported to an offsite location for long-term sequestration in a deep-saline aquifer. The Quest CCS facility has captured and permanently stored five million tonnes of CO2 as of 2020 – equivalent to the annual emissions from 1.25 million cars. The Quest cost of \$790 million is calculated by the operator as the capital required for the project to reach commercial operation and is reported to the Government of Alberta.

Comment

No comment

Identifier

Opp2

Where in the value chain does the opportunity occur?

Downstream

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Primary potential financial impact

Increased revenues through access to new and emerging markets

Company-specific description

Canadian Natural has a 50% interest in the NorthWest Redwater Partnership ("Redwater Partnership") which has agreements to operate a 50,000 barrel per day bitumen upgrader and refinery. Phase 1 will process 50,000 bbl/d of bitumen to finished products and will incorporate an integrated CO2 management solution that will produce lower-intensity diesel compared to other refineries. CO2 captured from the refinery serves as an anchor supply to the Alberta Carbon Trunk Line (ACTL) where it is used for enhanced oil recovery, permanently keeping CO2 out of the environment, while producing low-carbon energy. This also has the potential to increase revenues due to low-carbon fuel credits in markets such as British Columbia, and in the proposed Canadian Clean Fuel Standards credit market.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

16200000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

Approximate annual value of Canadian Natural's share of GHG offset credits earned by the Redwater project, calculated as 600,000 t/year at a credit value of \$27/tonne.

Cost to realize opportunity

495000000

Strategy to realize opportunity and explanation of cost calculation

Ensure the CO2 value is supported by the Alberta Carbon Trunk Line and the Enhance Energy Enhanced Oil Recovery project. \$495 million is the value of the Alberta government grant money for construction and development of the Alberta Carbon Trunk Line.

Comment

No comment

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resource efficiency

Primary climate-related opportunity driver

Use of more efficient production and distribution processes

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

In 2019, Canadian Natural completed approximately 443 solution gas conservation projects in its primary heavy crude oil operations, resulting in a reduction of approximately 2.3 million tonnes/ year of CO2e. Over the past five years we have spent over \$42 million in its primary heavy crude oil and in situ oil sands operations to conserve the equivalent of over 14.7 million tonnes of CO2e.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact figure

\$7.5 MM gas conserved minus project cost of \$4.3 MM

Cost to realize opportunity

4300000

Strategy to realize opportunity and explanation of cost calculation

Established processes for identifying and implementing solution gas conservation projects in primary heavy oil. 14.7 million tonnes of CO2e conserved through our solution gas conservation projects since 2015, equivalent to removing ~3.2 million passenger vehicles from the road over the same period.

Comment

No comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?

Yes, qualitative and quantitative

C3.1b

(C3.1b) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenarios and models applied	Details
Other, please specify (External climate scenario analysis)	<p>As part of its evaluation of climate change risk, Canadian Natural reviews independent external scenario analyses developed by energy firms and agencies representing a range of hypothetical paths of development through 2040. These external scenario analyses are a tool used to support business planning, identification of risks and opportunities, and include the consideration of a number of variables and assumptions related to markets, commodity prices, policy, regulation, technology, efficiency and reputation and incorporate a range of assumptions for lower carbon emissions environments. Aspects of climate change risk that have the most potential to influence Canadian Natural's business strategy include: future regulatory changes and associated compliance costs, commodity price, access to markets and capital, social preferences and reputational risk, and technology development. The review of external scenario analyses has influenced our investments in carbon capture, sequestration, storage and utilization projects, including reduction and capture of methane; CO2 capture from hydrogen plants; the potential use of molten carbonate fuel cells, and research into the production of biofuel from algae. Across the range of ambitious climate change scenarios, the expectation is that there will be substantial global production and consumption of crude oil and natural gas for decades to come. According to the International Energy Association (IEA) 2019 Sustainable Development (most stringent) climate scenario, crude oil demand would be close to 70 million barrels per day by 2040 from 2019 levels of approximately 100 million barrels per day. Crude oil and natural gas remains an important part of the global energy mix for the foreseeable future. In addition, global demand for natural gas is expected to grow, continuing to be an important source of energy and a way to significantly lower global GHG emissions. Natural gas is an integral part of our plan and the pathway to a lower carbon future. As one of the largest producers of natural gas in Canada, representing 22% of our portfolio in 2019, Canadian Natural's natural gas assets represent a reliable and affordable energy source for power generation, delivering improved environmental performance as the cleanest-burning hydrocarbon, with less than half the carbon footprint of coal. As a result, our reserves face limited risk even under more ambitious climate change scenarios. Our balanced portfolio of light, synthetic, and heavy crude oil and natural gas represents one of the strongest and most diverse asset portfolios of any energy producer in the world. Canadian Natural's GHG management strategy also helps mitigate climate change risks to our reserves.</p>

C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Climate-related risks have influenced our products and services strategy in terms of our evaluation of assets during acquisition assessments. For example, the acquisition of the Athabasca Oil Sands Project assets in 2017 was influenced by the GHG intensity performance of this asset, including the Quest carbon capture and storage project. This evaluation of climate-related risk and opportunities is applied over the planning time horizon of our business. An aspect of climate change risk that most influences Canadian Natural's business strategy is future compliance costs/regulatory changes. The costs of complying with environmental legislation in the future may have a material adverse effect on our financial condition. Current and potential climate change policies and regulations are considered when making decisions to advance the business strategy. We are actively tracking the development of policies and regulations at the international level, and at the national and provincial level in Canada. Canadian Natural's associated environmental risk management strategies focus on working with legislators and regulators to ensure that any new or revised policies, legislation or regulations properly reflect a balanced approach to sustainable development. Climate risk management occurs at the asset level through recurring project and technology reviews, as well as economic evaluations, including forecasting GHG intensity and compliance costs, and reviewing abatement projects. We also use an internal price of carbon to evaluate returns on future projects under different potential carbon regulations and to evaluate emission reduction projects. The internal price varies between \$30/t and \$50/t, depending on the jurisdiction and time-frame.
Supply chain and/or value chain	Yes	Climate-related risks contributed to our decision to partner with a midstream company (Williams Energy) on the investment in the Horizon Liquids Extraction Project (LEP), which reduces emissions at our Horizon facility, and therefore produces a product with lower GHG intensity and reduces the GHG compliance cost at Horizon. This program is expected to last the entire lifetime of the Horizon integrated oil sands operation.
Investment in R&D	Yes	Climate-related risks have substantially influenced our investments in R&D strategy, including the portion of R&D spending for emission mitigation research. We know that the investments we are making now to lower our GHG emissions will create long-term value, all while delivering the safe, secure, reliable and environmentally responsible energy the world needs. Achieving an aspirational target of net zero oil sands emissions and an oil sands emissions intensity target requires leveraging technology and innovation with defined actions in the near-, mid-, and long-term. The priorities for evaluation and investment include: Near-term actions: In-Pit Extraction Process (IPEP), solvent Enhanced Oil Recovery (EOR) pilots, Carbon Capture and Storage (CCS), pneumatic retrofits; Medium-term actions: IPEP commercialization activities, Titanium Corporation, Molten Carbonate Fuel Cells, Cyclic CO2 injection; and Long-term: Carbon capture and conversion, CCS We are working with relevant parties to ensure new policies encourage technological innovation, energy efficiency, and targeted R&D while not impacting competitiveness. Canadian Natural is a founding member and active participant in Canada's Oil Sands Innovation Alliance (COSIA). Through COSIA, Canadian Natural, along with other oil sands operators, is sharing valuable research and development information and technologies. This is an unparalleled collaboration to improve industry's environmental performance in the course of our operations. As one of the largest COSIA contributors, Canadian Natural has an important role in this collaborative effort. Since 2012, COSIA member companies have contributed more than 1,000 technologies at a development cost of \$1.4 billion to improve environmental performance, including for GHG reduction. We are a member of the Petroleum Technology Alliance Canada (PTAC) with 500 R&D projects launched to date, and a realized value of almost \$133 million per year. Canadian Natural is also a founding member of the Clean Resource Innovation Network (CRIN), an industry-led network launched in 2017 to leverage large-scale collaboration and align research and technology priorities. CRIN brings together the sectors necessary to accelerate the commercialization of new technologies with a vision that Canada is a global leader in producing clean hydrocarbon energy from source to end use.
Operations	Yes	Climate-related risks have influenced our operation's strategy by focusing our efforts on actions that deliver both GHG emission reductions and effective and efficient production of oil and gas. As a specific example, beginning in 2018 we have implemented a program to retrofit or remove certain pneumatic control devices. This has provided an environmental benefit of reduced GHG emissions (from reduced methane emissions), increased volumes of gas for sale (i.e., the gas not vented is sold), and improved operability from new control devices. Current plans for this project expect 2,400 pneumatic controllers to be replaced by the end of 2020. Emission reductions from these replacements will be realized throughout the facility lifetime. Typical facility lifetimes are in the 5-20 year timeframe. At facility end of life, equipment can be reused at other facilities and continue to generate GHG reductions.

C3.1e

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Capital allocation Access to capital	The additional requirements of enacted or proposed GHG regulations on Canadian Natural's operations may increase capital expenditures and production expenses, including those related to our existing and planned oil sands projects. Climate-related risks and opportunities influence our capital allocation decisions. For example, the decision to acquire the Athabasca Oil Sands Project assets in 2017 was influenced by the GHG intensity performance of this asset, including the Quest carbon capture and storage project. Both existing and proposed climate change policies and regulations are considered when making decisions to advance the business strategy.

C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

Our multidisciplinary risk management process considers climate change opportunities and risks as part of our business evaluation.

As a part of our Environmental Management Plan, we continue to identify opportunities to mitigate our climate change impacts through implementation of various emissions reduction programs and carbon capture projects (including CO2 injection for Enhanced Oil Recovery (EOR), CO2 sequestration in tailings and the Quest carbon capture and storage facility); a methane emissions reduction program, including solution gas conservation to reduce methane venting and an equipment retrofit program to reduce emissions from pneumatic equipment; and optimization of efficiencies at our facilities.

Aspects of climate change risk that most influence Canadian Natural's business strategy are: future regulatory changes and associated compliance costs, commodity price, access to markets and capital, social preferences and reputational risk, and technology development.

Future Regulatory Changes / Compliance Costs – The additional requirements of enacted or proposed GHG regulations on our operations may increase capital expenditures and production expenses, including those related to the company's existing and planned oil sands projects. This may have an adverse effect on Canadian Natural's financial condition. Accordingly, existing and proposed climate change policies and regulations are considered when making decisions to advance our business strategy. We are tracking the development of policies and regulations at the international, national, federal and provincial level. In Canada, the Government of Alberta has proceeded with implementing the measures in the Climate Leadership Plan that were announced in November 2015, including measures to reduce methane emissions, implement an emissions limit for oil sands, introduction of a broad-based carbon price (with phase-in for the upstream industry), and modification of the existing regulatory system for large emitting facilities. Canadian Natural continues to pursue GHG emissions reduction initiatives including: solution gas conservation, compressor optimization to improve fuel gas efficiency, reductions in pneumatic devices, CO2 capture and sequestration in oil sands tailings, CO2 capture and storage in association with EOR, CO2 capture and storage at Quest, and participation in Canada's Oil Sands Innovation Alliance (COSIA). Various jurisdictions have enacted or are evaluating low carbon fuel standards, which may affect access to market for crude oils with higher emissions intensity. The Canadian government and certain provincial governments have published regulations to reduce methane emissions from the oil and natural gas sector, in support of a joint commitment made by the US and Canadian governments to lower emissions from the sector by 2025. Canadian Natural could face additional costs to retrofit certain equipment to meet the requirements of the federal Multi-Sector Air Pollutants Regulations in Canada. Additional costs may be required to retrofit other equipment in specific regions to meet ambient air quality objectives as part of regional air zone management.

Access to Markets – Canadian Natural may be exposed to greater market risk for its products associated with the shift to a lower carbon emissions future. These risks may include increases in the demand for renewable energy sources, increases in compliance costs that may not be recoverable in the price of the product, which could delay the development of certain assets, and restricted access to markets for higher carbon energy sources. This could result in a competitive disadvantage if producers in other jurisdictions are not subject to similar regulatory burdens.

Social Preferences / Reputational Risk – Changes in public support for climate action, combined with increased activism and opposition to fossil fuels, particularly to oil sands, may impact the market for Canadian Natural's products and securities and impact its ability to obtain approvals for new projects and raise capital.

Technology Development – Regulatory and policy changes to address climate change may require Canadian Natural to develop or adopt new sustainable technologies to reduce its environmental footprint and to support the transition to a lower carbon emissions/energy efficient economy at significant cost. In addition, the development and emergence of renewable energy sources could affect the demand for our products thereby affecting its competitiveness and profitability.

Regulatory and Policy Effectiveness – Canadian Natural operates under government regulation and policy for the crude oil and natural gas sector including, land tenure, royalties, taxes, production rates, environmental management, and safety performance. Before proceeding with major projects, we must follow various regulatory processes to obtain project approvals and permits. These processes may include Indigenous and other stakeholder consultation, environmental impact assessments and public hearings. Canadian Natural's project execution and timelines could be impacted by delays experienced through the regulatory process or by conditions placed on its operations through permit approvals. Changes in government policy, such as the Canadian government's Impact Assessment Act, have the potential to impact the certainty and timelines for the regulatory process on large energy projects, including increased requirements for Indigenous consultation.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1

Year target was set

2019

Target coverage

Business activity

Scope(s) (or Scope 3 category)

Scope 1+2 (location-based)

Intensity metric

Metric tons CO2e per barrel of oil equivalent (BOE)

Base year

2016

Intensity figure in base year (metric tons CO2e per unit of activity)

0.1002

% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure

41

Target year

2025

Targeted reduction from base year (%)

25

Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]

0.07515

% change anticipated in absolute Scope 1+2 emissions

0

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year (metric tons CO2e per unit of activity)

0.0635

% of target achieved [auto-calculated]

146.506986027944

Target status in reporting year

Achieved

Is this a science-based target?

No, and we do not anticipate setting one in the next 2 years

Please explain (including target coverage)

We have publicly shared an internal target reduction of oil sands GHG emissions intensity by 25% by 2025, from a 2016 baseline.

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to reduce methane emissions

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2019

Target coverage

Business activity

Target type: absolute or intensity

Absolute

Target type: category & Metric (target numerator if reporting an intensity target)

Methane reduction target	Other, please specify (Total Methane Emissions in tonnes CH4 from North American E&P operations)
--------------------------	--

Target denominator (intensity targets only)

<Not Applicable>

Base year

2016

Figure or percentage in base year

184325

Target year

2025

Figure or percentage in target year

147460

Figure or percentage in reporting year

155492

% of target achieved [auto-calculated]

78.212396582124

Target status in reporting year

New

Is this target part of an emissions target?

Yes

Is this target part of an overarching initiative?

Reduce short-lived climate pollutants

Please explain (including target coverage)

Reduction of methane emissions in its North America E&P operations by 20% by 2025, from a 2016 baseline.

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	24	1236
To be implemented*	1611	671958
Implementation commenced*	0	0
Implemented*	4294	2682640
Not to be implemented	0	0

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Fugitive emissions reductions	Oil/natural gas methane leak capture/prevention
-------------------------------	---

Estimated annual CO2e savings (metric tonnes CO2e)

2682640

Scope(s)

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

7520000

Investment required (unit currency – as specified in C0.4)

4330000

Payback period

<1 year

Estimated lifetime of the initiative

3-5 years

Comment

The 3-5 year time-frame is for the field implementation of the initiative. Reductions achieved will continue over the lifetime of the facilities being retrofitted. Monetary savings is the estimated value of GHG credits earned.

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Canadian Natural has integrated emissions reduction strategies to meet performance goals and comply with requirements for GHG emissions and air pollutants. We participate in both the Canadian federal and provincial regulated GHG emissions reporting programs and quantify annual GHG emissions for internal and external reporting purposes. Canadian Natural recognizes the need to reduce GHG emissions and supports Canada's leadership in the Paris Agreement as a pathway to GHG reduction and driving innovation. We also support the federal and provincial goals to reduce methane emissions by 45% by 2025. Leveraging technology is a key part of our GHG reduction strategy. In 2019, we invested ~\$77 million in GHG emission reduction technologies and projects. Projects span from CCS to enhancing steam efficiencies and conserving solution gas. In addition to our existing projects, we continue to explore emission reduction technologies with the potential to make a significant difference, including: <ul style="list-style-type: none"> Using solvents at our Kirby thermal operation to reduce steam use, and GHG emissions, per barrel of production. Using Cyclic CO2 injection in Cold Heavy Oil Production with Sand (CHOPS) assets. Produced CO2 is captured/re-injected in the production cycle, which improves viscosity and flow rates, while CO2 remains permanently sequestered in the reservoir. Our Technology and Innovation (TI) team supports technology development efforts by managing information to accelerate technology adoption, strengthening our internal expertise through internal/external collaborations, and coordinating resources and investment. They manage external partnerships and technical collaborations to support strategic decisions, maintain transparency, and drive results. For example, senior management and TI support is embedded in our GHG Operations Strategy Committee, which oversees working groups that manage and coordinate GHG reduction and technology projects. The Committee also identifies and manages issues/risks (including regulatory/policy awareness) with a consistent approach toward technology deployment. TI teams provide support to help connect the areas, advance technologies, and assist each business unit in delivering their emissions reductions projects. For example, the Methane Steering Committee coordinates programs and technologies to reduce venting in our Alberta heavy oil operations.
Dedicated budget for other emissions reduction activities	Canadian Natural is committed to doing our part to reduce our emissions. Canadian Natural has been the leading R&D investor for the crude oil and natural gas sector for a number of years - investing \$3.4 billion since 2009. Leveraging technology and innovation is the best way to deliver improved environmental performance, reduced costs, and increased productivity.
Employee engagement	Climate risk management occurs at the asset level through recurring project reviews, technology reviews, and economic evaluations including forecasting GHG intensity and compliance costs, and reviewing abatement projects. Our Field Operations teams provide valuable input on new opportunities.
Internal price on carbon	Canadian Natural uses the current regulated price of carbon to evaluate returns on future projects under different potential carbon regulations and for evaluating emission reduction projects.
Internal incentives/recognition programs	Greenhouse gas emissions intensity (tonnes/BOE) is one measure in the corporate performance scorecard on which performance bonuses are based.
Marginal abatement cost curve	Canadian Natural has developed marginal abatement cost curves that guide our R&D investments.
Partnering with governments on technology development	We are working with the National Research Council of Canada (NRC) and Pond Technologies, a Canadian algae technology company, and St Marys Cement on an Algal Carbon Conversion Project. Testing on this technology began in 2016 at a pilot-scale biorefinery, located at St Marys Cement plant in Ontario. The pilot captures carbon dioxide from cement plant operations by placing them in large tanks with algae to promote photosynthesis with LED lights. Algae are pressed to release bio-oil for potential use in biofuels and biomaterials — and, at an oil sands operation, would be blended into heavy oil or synthetic crude oil. The leftover biomass can then be used to feed livestock and for land reclamation. Canadian Natural is undertaking a field pilot of its In-Pit Extraction Process (IPEP) technology, an alternative to conventional oil sands mining and ore processing. Emissions Reduction Alberta (ERA) is a partner in this project. IPEP technology involves a relocatable, modular extraction plant that moves as the mine face advances. Ore processing and bitumen separation occurs adjacent to mining operations, significantly reducing material transportation. Canadian Natural estimates that the IPEP technology could reduce GHG emissions by up to 40% in bitumen production compared to typical oil sands surface mining and extraction processes. In addition, Canadian Natural is working on another ERA-funded project to enhance the accuracy of GHG emissions measurements from large industrial area sources, typical of the oil sands region of Alberta. This research will help address some challenges faced by industry in quantifying the rates of methane and carbon dioxide (CO2) emissions, and allow the implementation of more effective strategies to reduce GHG emissions. This project deploys different working groups and approaches for measuring emissions using a holistic system of advanced sensors, laser and fiber optic technology, as well as computer models and meteorological data. The groups will deliver commercially proven technologies, guidelines for measurement and more accurate emissions profiles.
Other (Scenario Analysis)	As part of its evaluation of climate change risk, Canadian Natural reviews independent external scenario analyses developed by energy firms and agencies representing a range of hypothetical paths of development through 2040. These external scenario analyses are a tool used to support business planning, identification of risks and opportunities, and include the consideration of a number of variables and assumptions related to markets, commodity prices, policy, regulation, technology, efficiency and reputation and incorporate a range of assumptions for lower carbon emissions environments. Internally, we are pursuing an integrated emissions reduction strategy, to ensure we are able to comply with existing and future emissions reduction requirements, for both GHG and air pollutants (such as sulphur dioxide and oxides of nitrogen). Canadian Natural continues to develop strategies that will enable it to deal with the risks and opportunities associated with new GHG and air emissions policies, such as provincial and federal methane policy development. In addition, we are working with relevant parties to ensure that new policies encourage technological innovation, energy efficiency, and targeted research and development while not impacting competitiveness. The review of external scenario analyses has influenced the Company's investments in carbon capture, sequestration, storage and utilization projects, including reduction and capture of methane; CO2 capture from hydrogen plants; the potential use of molten carbonate fuel cells, and research into the production of biofuel from algae. Across the range of ambitious climate change scenarios, the expectation is that there will be substantial global production and consumption of crude oil and natural gas for decades to come. Canada is well positioned to be a global supplier of a premium, low carbon emissions intensity product to meet this demand. As result of Canadian Natural's GHG management strategy, our reserves face limited risk even under more ambitious climate change scenarios.

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

Level of aggregation

Product

Description of product/Group of products

Natural Gas

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (Natural Gas Identified as a transition fuel toward lower GHG intense fuels)

% revenue from low carbon product(s) in the reporting year

5.2

% of total portfolio value

<Not Applicable>

Asset classes/ product types

<Not Applicable>

Comment

As the world transitions to a lower carbon emissions economy, there will be better, lower carbon ways of producing and consuming oil and natural gas. As global demand for energy continues to grow, oil and natural gas remains an important part of the global energy mix for the foreseeable future.

C-OG4.6

(C-OG4.6) Describe your organization's efforts to reduce methane emissions from your activities.

Providing efficient leak detection and repair (LDAR). In 2019, we enhanced our Fugitive Emissions Management and Control program for natural gas, natural gas liquids, and crude oil operations in North America in compliance with new regulatory requirements in effect at the beginning of 2020. Our program is managed and executed in-house, adding area operational knowledge to our processes to continue to improve fugitive emission detection and expedite repairs. Reductions achieved will continue over the lifetime of the facilities being retrofitted. We have invested in leading Optical Gas Imaging cameras (and associated training) to complete comprehensive surveys at more than 4,000 locations across Alberta, Saskatchewan and British Columbia. Canadian Natural is also working with industry, the Petroleum Technology Alliance Canada (PTAC) and other partners to develop more accurate systems and technologies for quantifying fugitive emissions, accelerating leak detection and repair, and reducing venting to improve operational efficiencies, reduce emissions and support the development of best practices.

C-OG4.7

(C-OG4.7) Does your organization conduct leak detection and repair (LDAR) or use other methods to find and fix fugitive methane emissions from oil and gas production activities?

Yes

C-OG4.7a

(C-OG4.7a) Describe the protocol through which methane leak detection and repair or other leak detection methods, are conducted for oil and gas production activities, including predominant frequency of inspections, estimates of assets covered, and methodologies employed.

The goal of Canadian Natural's Fugitive Emission Management and Control (FEMC) program is to reduce fugitive emissions by providing an efficient means to identify larger gas leaks and prioritize them for repair. In Alberta for 2019, the procedure applies to any location that has more than 1,000 hp (utilized) of reciprocating compression and sweet gas streams (< 1% H₂S). In British Columbia, the procedure applies to any location that has more than 250 hp (rated) of reciprocating compression and streams with gas containing greater than 10% CH₄ plus CO₂ by weight. These thresholds result in more than 200 facilities being addressed by the FEMC. Canadian Natural's FEMC program is comprised of the following strategies: 1. Regular targeted monitoring using handheld gas detectors is performed on components with a medium to high leak potential, on a quarterly or annual basis depending on specific component types; 2. Following maintenance or adjustment, all affected components are leak-checked using handheld gas detectors; and 3. Comprehensive leak surveys of facilities are performed once every three to five years using an infrared leak imaging camera and Hi Flow Sampler to detect and quantify fugitive emissions and provide a check of any components not specifically addressed in steps 1 or 2.

At one specific facility, Kirby South, the 2019 LDAR infrared survey identified 45 separate low volume gas releases. These leaks were entered into Canadian Natural's maintenance and repair schedules to reduce total vented emissions by over 36 tCO₂e in 2019.

C-OG4.8

(C-OG4.8) If flaring is relevant to your oil and gas production activities, describe your organization's efforts to reduce flaring, including any flaring reduction targets.

Canada has the highest flaring emissions management standards in the world. Canadian Natural's strategy for managing GHG emissions focuses on improving energy conservation and efficiency, reducing emissions intensity, supporting associated research and development, and adopting innovative technologies. Canadian Natural meets all compliance obligations and targets.

Canadian Natural's strategy for managing GHG emissions focuses on improving energy conservation and efficiency, reducing emissions intensity, supporting associated research and development, and adopting innovative technologies. To support this strategy, we have flaring, venting, fuel and natural gas conservation programs in place.

Canadian Natural and the entire Canadian oil and gas sector have delivered game-changing environmental performance. Canada's oil and gas sector recognized the need to reduce greenhouse gas emissions and we have leveraged technology and Canadian ingenuity to deliver impressive results. If the rest of the world achieved what the Canadian oil and gas industry has in terms of flaring standards, then GHG emissions would be reduced by 23%, equivalent to taking 110 million cars off the road. For reference, that's more than three times the number of vehicles on the road today in Canada.

C5. Emissions methodology

C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

Scope 1

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

21638540

Comment

Contains all operated facilities minus 30% of Albanian mine Scope 1 emissions to account for Joint Venture ownership.

Scope 2 (location-based)

Base year start

January 1 2019

Base year end

December 31 2019

Base year emissions (metric tons CO2e)

2781314

Comment

Contains all operated facilities minus 30% of Albanian mine Scope 2 emissions to account for Joint Venture ownership.

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009

Canadian Association of Petroleum Producers, Calculating Greenhouse Gas Emissions, 2003

European Union Emission Trading System (EU ETS): The Monitoring and Reporting Regulation (MMR) – General guidance for installations

ISO 14064-1

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)
21638540

Start date
<Not Applicable>

End date
<Not Applicable>

Comment
Contains all operated facilities minus 30% of Albanian mine Scope 1 emissions to account for Joint Venture ownership.

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based
We have operations where we are able to access electricity supplier emission factors or residual emissions factors, but are unable to report a Scope 2, market-based figure

Comment

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
2781314

Scope 2, market-based (if applicable)
<Not Applicable>

Start date
<Not Applicable>

End date
<Not Applicable>

Comment
Contains all operated facilities minus 30% of Albanian mine Scope 2 emissions to account for Joint Venture ownership.

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source

Emissions from fuel consumed in light company vehicles

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)

Please select

Explain why this source is excluded

Estimated to be immaterial (<0.5%). Difficult to track accurately

Source

Propane use for fuel on small sites

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)

Please select

Explain why this source is excluded

Estimated to be immaterial (<0.1%). Difficult to track accurately

Source

Diesel used for backup / emergency generators in conventional operations

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)

Please select

Explain why this source is excluded

Estimated to be immaterial (<0.5%). Difficult to track accurately

Source

Vapour emissions from spills of liquid hydrocarbons and accidental venting incidents

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

No emissions from this source

Relevance of market-based Scope 2 emissions from this source (if applicable)

Please select

Explain why this source is excluded

Estimated to be immaterial (<1%). Difficult to track accurately

Source

Emissions attributed to 30% JV ownership of Albanian Mine

Relevance of Scope 1 emissions from this source

Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source

Emissions are not relevant

Relevance of market-based Scope 2 emissions from this source (if applicable)

Please select

Explain why this source is excluded

Albanian mine (operated by Canadian Natural) is 30% owned by joint venture partners. For purposes of reporting production from this facility, 30% of production is subtracted off total production from the site as it's attributed to the Joint Venture partners. In order to not misrepresent associated emissions and overall GHG intensity of operations, 30% of the emissions from this site are also subtracted off reported values.

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Capital goods

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Upstream transportation and distribution

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Waste generated in operations

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Business travel

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Employee commuting

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Upstream leased assets

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Downstream transportation and distribution

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Processing of sold products

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Use of sold products

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

End of life treatment of sold products

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Downstream leased assets

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Franchises

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Investments

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Other (upstream)

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

Other (downstream)

Evaluation status

Not evaluated

Metric tonnes CO2e

<Not Applicable>

Emissions calculation methodology

<Not Applicable>

Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

Please explain

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

No

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.0010010598

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

24419853.45

Metric denominator

unit total revenue

Metric denominator: Unit total

24394000000

Scope 2 figure used

Location-based

% change from previous year

10.83

Direction of change

Decreased

Reason for change

Change due to emission reduction activities (specifically: expanded pneumatic replacement and retrofit program, and solution gas conservation projects), and due to higher commodity prices.

C-OG6.12

(C-OG6.12) Provide the intensity figures for Scope 1 emissions (metric tons CO2e) per unit of hydrocarbon category.

Unit of hydrocarbon category (denominator)

Other, please specify (thousands of barrels of oil equivalent)

Metric tons CO2e from hydrocarbon category per unit specified

53.95

% change from previous year

3

Direction of change

Decreased

Reason for change

Change due to emission reduction activities (specifically: expanded pneumatic replacement and retrofit program, and solution gas conservation projects)

Comment

C-OG6.13

(C-OG6.13) Report your methane emissions as percentages of natural gas and hydrocarbon production or throughput.

Oil and gas business division

Upstream

Estimated total methane emitted expressed as % of natural gas production or throughput at given division

1.65

Estimated total methane emitted expressed as % of total hydrocarbon production or throughput at given division

0.37

Comment

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	17002735	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	4209443	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	462537	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	3405	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	270	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (CF4)	4	IPCC Fourth Assessment Report (AR4 - 100 year)

C-OG7.1b

(C-OG7.1b) Break down your total gross global Scope 1 emissions from oil and gas value chain production activities by greenhouse gas type.

Emissions category

Combustion (excluding flaring)

Value chain

Upstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

15004533

Gross Scope 1 methane emissions (metric tons CH4)

33226

Total gross Scope 1 emissions (metric tons CO2e)

16297213

Comment

Emissions category

Flaring

Value chain

Upstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

863524

Gross Scope 1 methane emissions (metric tons CH4)

1661

Total gross Scope 1 emissions (metric tons CO2e)

905063

Comment

Emissions category

Venting

Value chain

Upstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

30451

Gross Scope 1 methane emissions (metric tons CH4)

68520

Total gross Scope 1 emissions (metric tons CO2e)

1743457

Comment

Emissions category

Fugitives

Value chain

Upstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

196415

Gross Scope 1 methane emissions (metric tons CH4)

64880

Total gross Scope 1 emissions (metric tons CO2e)

1818416

Comment

Emissions category

Process (feedstock) emissions

Value chain

Upstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

906314

Gross Scope 1 methane emissions (metric tons CH4)

0

Total gross Scope 1 emissions (metric tons CO2e)

906314

Comment

Emissions category

Other (please specify) (Waste and Waste Water Emissions)

Value chain

Upstream

Product

Unable to disaggregate

Gross Scope 1 CO2 emissions (metric tons CO2)

1500

Gross Scope 1 methane emissions (metric tons CH4)

90

Total gross Scope 1 emissions (metric tons CO2e)

4253

Comment**C7.2****(C7.2) Break down your total gross global Scope 1 emissions by country/region.**

Country/Region	Scope 1 emissions (metric tons CO2e)
Canada	20192956
United Kingdom of Great Britain and Northern Ireland	972636
Côte d'Ivoire	472948

C7.3**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

By business division

C7.3a**(C7.3a) Break down your total gross global Scope 1 emissions by business division.**

Business division	Scope 1 emissions (metric ton CO2e)
NA Conventional E&P	13760554
Oil Sands Mining	6432402
CNR International	1445584

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4**(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.**

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	21638540	<Not Applicable>	All company Scope 1 emissions attributed to Upstream Oil and Gas activities
Oil and gas production activities (midstream)	0	<Not Applicable>	
Oil and gas production activities (downstream)	0	<Not Applicable>	
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
Canada	2781314	0	8290247	183106

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By activity

C7.6c

(C7.6c) Break down your total gross global Scope 2 emissions by business activity.

Activity	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Oil and Gas Production Activities	2781314	0

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	2781314	0	All company Scope 2 emissions attributed to Upstream Oil and Gas activities
Oil and gas production activities (midstream)	0	0	
Oil and gas production activities (downstream)	0	0	
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption		<Not Applicable >		
Other emissions reduction activities	2682640	Decreased	10.72	We reduced gross global emissions by executing emission reduction activities. The largest contributor being 443 gas conservation projects in primary heavy crude oil operations Canadian Natural completed in 2019. This resulted in the reduction of approximately 2.3 million tonnes/year of CO2e. To calculate the percentage reduction, we summed total reductions attributed to emission reduction activities and divided by the total Scope 1 + Scope 2 emissions from 2018 (25 MtCO2e). This was multiplied by 100 to give the total % reductions. Emission reductions include the following projects and reductions: Gas conservation – 2,343,251 tCO2e Pneumatic controller replacement projects – 175,068 tCO2e CO2 injected into tailings ponds – 16,370 tCO2e Engine fuel management and gas capture projects – 51,583 tCO2e Facility electrification projects – 79,438 tCO2e CO2 injection for enhanced oil recovery – 16,930 tCO2e Final numbers used for calculation are $(2,682,640/25,015,700)*100 = 10.72\%$
Divestment		<Not Applicable >		
Acquisitions		<Not Applicable >		
Mergers		<Not Applicable >		
Change in output		<Not Applicable >		
Change in methodology		<Not Applicable >		
Change in boundary		<Not Applicable >		
Change in physical operating conditions		<Not Applicable >		
Unidentified		<Not Applicable >		
Other		<Not Applicable >		

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 15% but less than or equal to 20%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	80647568	80647568
Consumption of purchased or acquired electricity	<Not Applicable>	183106	4247438	4430544
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	3591224	3591224
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	183106	88486231	88669337

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	Yes
Consumption of fuel for co-generation or tri-generation	Yes

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity				
Heat				
Steam				
Cooling				

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C-OG9.2a

(C-OG9.2a) Disclose your net liquid and gas hydrocarbon production (total of subsidiaries and equity-accounted entities).

	In-year net production	Comment
Crude oil and condensate, million barrels	88.97	2019 production
Natural gas liquids, million barrels	15.9	2019 production
Oil sands, million barrels (includes bitumen and synthetic crude)	205.52	2019 production; includes Bitumen (Thermal Oil) and Oil Sands Mining & Upgrading Synthetic Crude Oil
Natural gas, billion cubic feet	544.22	2019 production

C-OG9.2b

(C-OG9.2b) Explain which listing requirements or other methodologies you use to report reserves data. If your organization cannot provide data due to legal restrictions on reporting reserves figures in certain countries, please explain this.

For the year ended December 31, 2019, Canadian Natural retained Independent Qualified Reserves Evaluators (“IQRE”), Sproule Associates Limited and Sproule International Limited (together as “Sproule”) and GLJ Petroleum Consultants Ltd. (“GLJ”), to evaluate and review all of our proved and proved plus probable reserves with an effective date of December 31, 2019 and a preparation date of February 3, 2020. Sproule evaluated and reviewed the North America and International light and medium crude oil, primary heavy crude oil, Pelican Lake heavy crude oil, bitumen (thermal oil), natural gas and NGLs reserves. GLJ evaluated the Oil Sands Mining and Upgrading SCO reserves. The evaluations and reviews were conducted and prepared in accordance with the standards contained in the Canadian Oil and Gas Evaluation Handbook (“COGE Handbook”) and disclosed in accordance with National Instrument 51-101 – Standards of Disclosure for Oil and Gas Activities (“NI 51-101”) requirements.

C-OG9.2c

(C-OG9.2c) Disclose your estimated total net reserves and resource base (million boe), including the total associated with subsidiaries and equity-accounted entities.

	Estimated total net proved + probable reserves (2P) (million BOE)	Estimated total net proved + probable + possible reserves (3P) (million BOE)	Estimated net total resource base (million BOE)	Comment
Row 1	14252	14252	14252	Company gross (working interest before royalties)

C-OG9.2d

(C-OG9.2d) Provide an indicative percentage split for 2P, 3P reserves, and total resource base by hydrocarbon categories.

	Net proved + probable reserves (2P) (%)	Net proved + probable + possible reserves (3P) (%)	Net total resource base (%)	Comment
Crude oil/ condensate/ natural gas liquids	12	12	12	
Natural gas	11	11	11	
Oil sands (includes bitumen and synthetic crude)	77	77	77	Includes Bitumen (Thermal Oil) and Oil Sands Mining & Upgrading synthetic crude oil

C-OG9.2e

(C-OG9.2e) Provide an indicative percentage split for production, 1P, 2P, 3P reserves, and total resource base by development types.

Development type

Onshore

In-year net production (%)

29

Net proved reserves (1P) (%)

10

Net proved + probable reserves (2P) (%)

11

Net proved + probable + possible reserves (3P) (%)

11

Net total resource base (%)

11

Comment

Development type

Shallow-water

In-year net production (%)

3

Net proved reserves (1P) (%)

1

Net proved + probable reserves (2P) (%)

1

Net proved + probable + possible reserves (3P) (%)

1

Net total resource base (%)

1

Comment

Development type

Deepwater

In-year net production (%)

2

Net proved reserves (1P) (%)

1

Net proved + probable reserves (2P) (%)

1

Net proved + probable + possible reserves (3P) (%)

1

Net total resource base (%)

1

Comment

Development type

Oil sand/extra heavy oil

In-year net production (%)

59

Net proved reserves (1P) (%)

80

Net proved + probable reserves (2P) (%)

77

Net proved + probable + possible reserves (3P) (%)

77

Net total resource base (%)

77

Comment

Includes Bitumen (Thermal Oil) and Oil Sands Mining & Upgrading SCO

Development type

Tight/shale

In-year net production (%)

7

Net proved reserves (1P) (%)

8

Net proved + probable reserves (2P) (%)

10

Net proved + probable + possible reserves (3P) (%)

10

Net total resource base (%)

10

Comment

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	Canadian Natural has a defined pathway to drive long-term reduction in emissions intensity. Leveraging technology is a key part of our GHG emissions reduction strategy. In 2019, we invested \$77.4 million in GHG reduction research, technologies and projects. Over and above the 2019 investment in GHG R&D, we are focused on advancing technologies in carbon capture initiatives to drive further emissions intensity reductions. We currently integrate state-of-the-art carbon capture technologies in our projects – including CO2 capture capacity at our Horizon operations, a 70% interest in the Quest CCS facilities at the Scotford Upgrader, a 50% stake in the North West Redwater Sturgeon Refinery, and CO2 capture at the Hays natural gas plant. These projects combined are capable of capturing 2.7 million tonnes/year of carbon dioxide equivalent (CO2e) – equivalent to taking ~576,000 cars off the road per year. Canadian Natural is actively evaluating and developing a wide range of unique projects with the potential to make a significant difference in emission intensity reduction. These technologies are at different stages of readiness, from discovery to deployment. Collectively, our robust portfolio of technology projects will drive continuous improvement towards our GHG targets. Examples of 2019 technology projects: • Co-injecting solvent with steam to reduce the amount of water needed for improving bitumen viscosity, and help recover more crude oil with less steam. Our Kirby South pilot is testing solvent effectiveness to increase oil recovery in a steam-assisted gravity drainage (SAGD) reservoir with potential emissions intensity reduction of 50%. • Testing Horizon's In-Pit Extraction Process to determine the feasibility of bitumen separation right in the mine pit, resulting in potential GHG emissions reduction by approximately 40% for bitumen production. • Assessing global technologies and solutions to convert natural gas into a hydrogen rich fuel and a valuable co-product, with the goal of reducing carbon content. Hydrogen rich fuel, when burned in the boilers, would produce less CO2 emissions and yield co-products to use in oil sands extraction and production processes, or to sell to offset costs. We also invest in industry research and technology sharing through Canada's Oil Sands Innovation Alliance (COSIA).

(C-CO9.6a/C-EU9.6a/C-OG9.6a) Provide details of your organization's investments in low-carbon R&D for your sector activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Carbon capture and storage/utilisation	Large scale commercial deployment	0%		At Horizon, 259,814 tonnes of CO ₂ has been injected from 2010 through 2019. Our CO ₂ recovery plant captures up to 50 tonnes/hour of CO ₂ from the hydrogen plant, where it is then injected into the tailings. Our Quest Carbon Capture and Storage (CCS) facility is located at the Scotford Upgrader and is part of the Athabasca Oil Sands Project (AOSP), of which Canadian Natural has a 70% ownership interest. The Quest CCS facility reached five million tonnes of CO ₂ permanently captured and stored from 2015 to 2020.
Enhanced Oil Recovery (EOR) techniques	Large scale commercial deployment	≤20%		At our Hays Gas Plant in Taber, Alberta, we capture up to 12,000 tonnes of CO ₂ per year for re-use/sequestration in our nearby Enchant Enhanced Oil Recovery (EOR) operations. Canadian Natural is a 50% partner in the North West Redwater (NWR) Sturgeon Refinery, targeted to capture 1.2 million tonnes of CO ₂ annually for EOR.
Methane detection and reduction	Large scale commercial deployment	≤20%		Canadian Natural is removing or converting high-emitting pneumatic controllers to low-emitting ones. Together with partners, we are also investing in the development of more accurate systems and technologies for quantifying fugitive emissions, accelerating leak detection and repair, and reducing venting. Through these programs, we are targeting a GHG reduction of up to 400,000 tonnes of CO ₂ equivalent per year.
Hydrogen	Applied research and development	≤20%		The Canadian Natural-led study, 'Natural Gas Decarbonization Global Technology Scan and Evaluation', looked at technologies and solutions available around the world to convert natural gas into a hydrogen rich fuel and a valuable co-product, with the ultimate goal of reducing carbon content. This hydrogen rich fuel, when burned in the boilers, would produce less carbon dioxide (CO ₂) emissions and yield co-products to use in the oil sands extraction and production processes, or to sell to offset costs.
Smart systems	Small scale commercial deployment	≤20%		The Steam Analyzer project uses automated steam allocation technology, maximizing steam production while optimizing the allocation of steam to the best performing wells in priority. It also stabilizes steam production resulting in higher steam quality, targeting a GHG reduction of 5,200 tCO ₂ /yr with more efficient steam generation.
Other, please specify (Boiler efficiency upgrades)	Large scale commercial deployment	≤20%		Canadian Natural is investing in control system upgrades that will enable tighter firing control of boilers and facilitate an increase in steam quality. The resulting increase in boiler efficiency and production results in a GHG reduction of 36,000 t/yr CO ₂ e.
Advanced fluids	Pilot demonstration	≤20%		We are co-injecting solvent with steam to reduce the amount of water needed for improving bitumen viscosity, and help recover more crude oil with less steam. Our pilot at Kirby South is testing solvent effectiveness to increase oil recovery in a steam-assisted gravity drainage (SAGD) reservoir. This project aims to increase efficiencies to reduce steam, translating into up to 50% reduced GHG emissions intensity.
Other, please specify (In-Pit Extraction Process)	Pilot demonstration	≤20%		At Horizon, a field pilot is underway on an alternative bitumen extraction method — the In-Pit Extraction Process (IPEP). This involves a relocatable, modular extraction plant that processes ore and separates bitumen right in the mine pit. IPEP reduces materials transportation by truck, pipeline length and the energy needed to pump material. This process also produces stackable dry tailings, eliminating tailings ponds. IPEP could potentially reduce our bitumen production GHG emissions by approximately 40% if successful.

C-OG9.7

(C-OG9.7) Disclose the breakeven price (US\$/BOE) required for cash neutrality during the reporting year, i.e. where cash flow from operations covers CAPEX and dividends paid/ share buybacks.

C-OG9.8

(C-OG9.8) Is your organization involved in the sequestration of CO₂?

Yes

C-OG9.8a

(C-OG9.8a) Provide, in metric tons CO₂, gross masses of CO₂ transferred in and out of the reporting organization (as defined by the consolidation basis).

	CO ₂ transferred – reporting year (metric tons CO ₂)
CO ₂ transferred in	0
CO ₂ transferred out	0

C-OG9.8b

(C-OG9.8b) Provide gross masses of CO₂ injected and stored for the purposes of CCS during the reporting year according to the injection and storage pathway.

Injection and storage pathway	Injected CO ₂ (metric tons CO ₂)	Percentage of injected CO ₂ intended for long-term (>100 year) storage	Year in which injection began	Cumulative CO ₂ injected and stored (metric tons CO ₂)
CO ₂ used for enhanced oil recovery (EOR) or enhanced gas recovery (EGR)	16930	100	January 1 2004	337848
Other, please specify (CO ₂ sequestration in tailings)	16370	100	January 1 2009	259814

C-OG9.8c

(C-OG9.8c) Provide clarification on any other relevant information pertaining to your activities related to transfer and sequestration of CO2.

CO2 has been injected into wells in the Hays field to stimulate increased production and maintain reservoir pressure since 2004. Since 2009, CO2 sourced from hydrogen production industrial process emissions has been injected into the tailings line at the Horizon mine and upgrader site. This improves tailings settling properties, and a portion of the injected CO2 remains in solution, or precipitates to the bed of the pond as carbonate solids.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	No emissions data provided

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

Y

11149420-RPT9-Verification Report for Primrose and Wolf Lake.pdf

11149425-RPT-10-FINAL-Peace River Verification Report.pdf

11155493-RPT-4-Wapiti Gas Plant 2019 Verification Report.pdf

11114722-RPT-12-Horizon 2019 Verification Report (Final).pdf

05 GcBC51_MRM and JPM 2019 Verification Report.pdf

11187407-RPT-4- FINAL-Brintnell 2019 Verification Report_.pdf

11149421-RPT-12-2019 Final ERP Verification Report(LF).pdf

11204699-RPT-2-CNRL Jackfish Verification Report.pdf

03 2019 Kirby South-GHG Verification Report.pdf

Page/ section reference

Entire final verification reports have been provided for facilities that underwent verification (9 total). Depending on the facility, final statement of verification are on various pages.

Relevant standard

Alberta Carbon Competitiveness Incentive Regulation (CCIR)

Proportion of reported emissions verified (%)

57

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

Y

Banff AEM Report 2019 FINAL.pdf

NCP AEM Report 2019 FINAL.pdf

NSP AEM Report 2019 FINAL.pdf

TIF AEM Report 2019 FINAL.pdf

Page/ section reference

Entire final verification reports have been provided for facilities that underwent verification. 4 facilities total.

Relevant standard

European Union Emissions Trading System (EU ETS)

Proportion of reported emissions verified (%)

4

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Underway but not complete for reporting year – previous statement of process attached

Type of verification or assurance

Reasonable assurance

Attach the statement

2018 Final Verification Report GHD.pdf

Page/ section reference

All Canadian (Alberta, British Columbia, Saskatchewan, and Manitoba) third party verification's have been (or are being) conducted to adhere to ISO 14064-3 standards. Also attached is the 2018 verification report for facilities located in British Columbia. Facilities located in British Columbia made up 5.01% of total company Scope 1 emissions in 2019.

Relevant standard

ISO14064-3

Proportion of reported emissions verified (%)

65

C10.1b

(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach

Scope 2 location-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Reasonable assurance

Attach the statement

Page/ section reference

As per Alberta CCIR regulations (replaced SGER in 2018) Scope 2 emissions are held to the same verification standards as Scope 1 emissions. See Alberta facility verification reports attached to this submission.

Relevant standard

Alberta Carbon Competitiveness Incentive Regulation (CCIR)

Proportion of reported emissions verified (%)

54

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

Yes

C11.1a

(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.

Alberta Carbon Competitive Incentive Regulation (CCIR) – ETS

BC carbon tax

Canada federal fuel charge

EU ETS

C11.1b

(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.

Alberta Carbon Competitive Incentive Regulation (CCIR) – ETS

% of Scope 1 emissions covered by the ETS

57.09

% of Scope 2 emissions covered by the ETS

53.63

Period start date

January 1 2019

Period end date

December 31 2019

Allowances allocated

10619530

Allowances purchased

2145843

Verified Scope 1 emissions in metric tons CO2e

12354328

Verified Scope 2 emissions in metric tons CO2e

1491734

Details of ownership

Facilities we own and operate

Comment

Excludes 30% of Albian mine emissions to account for ownership by third parties (Joint venture partners own 30% operation).

EU ETS

% of Scope 1 emissions covered by the ETS

4.49

% of Scope 2 emissions covered by the ETS

0

Period start date

January 1 2019

Period end date

December 31 2019

Allowances allocated

265238

Allowances purchased

766374

Verified Scope 1 emissions in metric tons CO2e

972636

Verified Scope 2 emissions in metric tons CO2e

0

Details of ownership

Facilities we own and operate

Comment

C11.1c

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

BC carbon tax

Period start date

January 1 2019

Period end date

December 31 2019

% of total Scope 1 emissions covered by tax

3.16

Total cost of tax paid

23100000

Comment

Canada federal fuel charge

Period start date

January 1 2019

Period end date

December 31 2019

% of total Scope 1 emissions covered by tax

0.62

Total cost of tax paid

2701675

Comment

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

For the GHG regulations in Alberta, Saskatchewan, Manitoba, and the UK, we comply with the regulations in the following manner:

- We calculate facility-level GHG emissions, according to the applicable regulatory requirements for quantification
- We calculate the amount of free emissions allocation, according to the regulatory requirements for the relevant jurisdiction
- We calculate the compliance obligation, as the difference between the facility-level GHG emissions and the compliance obligation
- All of the above information is then third party verified.

We meet the compliance obligation through retiring GHG credits, paying cash for government-issued GHG credits or a combination of both, depending on the regulatory requirements for the relevant jurisdiction. GHG credits may have been elsewhere within the company's operations, at a lower cost than the payments to government for GHG credits.

For the BC carbon tax, we comply by remitting monthly payments to the BC government, based on the volume of fuel gas and flare gas used by our BC operations.

As a specific example, for the Primrose in situ oil sands operation, we calculated the emissions as per the Alberta government's quantification standard, we calculated the amount of free emissions allocation based on the facility production, made the required deduction to account for imported electricity, and then calculated the compliance obligation (as tonnes owed). All of this data was third party verified. We then met the compliance obligation under the regulation by surrendering some GHG credits held by Canadian Natural, and by purchasing additional GHG credits from the Alberta government.

Canadian Natural supports GHG crediting programs in provinces such as the Alberta and British Columbia offsets systems, and similar systems being developed in Saskatchewan as well as with the federal government. We believe these help accelerate GHG reduction opportunities in the broader economy and help spur innovation by giving a financial value to emissions reductions. Canadian Natural has been generating GHG offset credits from the Quest Carbon Capture and Storage project, for use of CO2 in enhanced oil recovery, for methane reductions from pneumatic device retrofits, for facility electrification in BC, and for engine fuel efficiency at compressor engines at sites in Alberta and British Columbia.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

C11.2a

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.

Credit origination or credit purchase

Credit origination

Project type

CO2 usage

Project identification

Enhanced Oil Recovery (EOR) using CO2 injection technology at Hays gas plant / field

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

0

Number of credits (metric tonnes CO2e): Risk adjusted volume

13390

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit origination

Project type

Methane avoidance

Project identification

Pneumatic controller retrofit and replacement projects

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

0

Number of credits (metric tonnes CO2e): Risk adjusted volume

246823

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit origination

Project type

Methane avoidance

Project identification

Instrument air conversion projects

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

206

Number of credits (metric tonnes CO2e): Risk adjusted volume

206

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit origination

Project type

Other, please specify (Carbon Capture and Storage)

Project identification

Quest Carbon Capture and Storage Project

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

1186486

Number of credits (metric tonnes CO2e): Risk adjusted volume

1186486

Credits cancelled

No

Purpose, e.g. compliance

Credit origination or credit purchase

Credit origination

Project type

Other, please specify (Liquids extraction project)

Project identification

Horizon Oil Sands production facility operates with a Liquids Extraction Plant which recovers liquid product from Refinery Fuel Gas and reduced site GHG emissions

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

0

Number of credits (metric tonnes CO2e): Risk adjusted volume

64239

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit purchase

Project type

Other, please specify (Carbon Capture and Storage)

Project identification

Quest Carbon capture and Storage Project

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

384540

Number of credits (metric tonnes CO2e): Risk adjusted volume

384540

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit purchase

Project type

Wind

Project identification

Blue Trail Wind Farms

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

1190

Number of credits (metric tonnes CO2e): Risk adjusted volume

1190

Credits cancelled

No

Purpose, e.g. compliance

Compliance

Credit origination or credit purchase

Credit purchase

Project type

Agriculture

Project identification

Tillage project #27, for no till agriculture

Verified to which standard

Other, please specify (Alberta Offset System)

Number of credits (metric tonnes CO2e)

75000

Number of credits (metric tonnes CO2e): Risk adjusted volume

75000

Credits cancelled

No

Purpose, e.g. compliance

Compliance

C11.3

(C11.3) Does your organization use an internal price on carbon?

Yes

C11.3a

(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price

Stress test investments

GHG Scope

Scope 1

Application

Corporate structure that price is applied to (i.e. business units, corporate divisions, facilities)

Actual price(s) used (Currency /metric ton)

30

Variance of price(s) used

BC: \$40/t in 2020, increasing to \$50/t in 2021. AB/SK/MB: \$30/t in 2020, increasing to \$40/t in 2021 and \$50/2022. Price vary between \$30/t and \$50/t, depending on the jurisdiction and time-frame.

Type of internal carbon price

Shadow price

Offsets

Impact & implication

In our NA E&P Alberta operations, we have used the carbon price for GHG offsets credits earned from pneumatic controller retrofits to enhance the project economics and increase the amount of controllers retrofit or removed. This reduced emissions by an estimated at 246,823 tonnes in 2019.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, other partners in the value chain

C12.1d

(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.

At our Horizon Oil Sands project, we earlier entered into discussions with Williams Energy (a midstream company) on an opportunity for a Liquids Extraction Project (LEP). Williams had previously developed a similar project at a similar oil sands mining and upgrading facility. Discussions resulted in a commercial agreement on implementation of the LEP at Horizon, with operation of the LEP beginning in 2016. It is currently owned and operated by Inter Pipeline Limited. The LEP processes off-gas from Horizon's upgrading process to recover hydrocarbon liquids (such as ethane and propane). These liquids are then transported off site for use by Inter Pipeline in their midstream business. Prior to the LEP, the off-gas stream had been used as a source of fuel gas by Horizon operations. With the LEP in operation, Horizon no longer uses the off-gas stream for fuel, and has replaced it with pipeline-quality fuel gas, which has a lower GHG intensity per gigajoule than the off-gas stream. The operation of the LEP reduced GHG emissions at Horizon by approximately 128,000 t CO2e in 2019.

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers

Trade associations

Funding research organizations

C12.3a

(C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Carbon tax	Support with minor exceptions	Working with the Canadian Association of Petroleum Producers and directly with policy makers and regulators to provide advice and analysis on potential regulations. We work with governments to ensure that new and leading climate policy encourages technological innovation and deployment to achieve cost-effective GHG emissions reductions and energy efficiency while maintaining competitiveness of Canada's upstream oil and gas industry.	Support carbon pricing programs (which may or may not include a carbon tax), if there is allowance for competitiveness impacts on energy-intensive trade-exposed (EITE) sectors, and if a significant portion of revenue is used for developing technologies that will reduce carbon emissions. Propose measures for EITE sectors to minimize competitiveness impact and reduce carbon leakage (e.g., performance standards based on benchmarking; offsetting fiscal measures). For example, we provided input on: the new Alberta Technology Innovation Emissions Reduction (TIER) system to ensure provision for small facilities; the proposed Federal Government Clean Fuel Standards; and advocated with provincial and federal governments for equivalency agreements to recognize provincial methane regulations for federal requirements.
Regulation of methane emissions	Support with minor exceptions	Support overall focus on methane emission reductions. Working with the Canadian Association of Petroleum Producers and directly with policy makers and regulators to provide advice and analysis on potential regulations.	Support an outcome based approach to methane regulation and advocate for an incentive-based period for reducing methane emissions prior to regulations coming into effect. Methane regulations should be implemented in a staged approach to reflect the reductions that are delivered through the incentive-based portion of the hybrid approach.
Other, please specify (Article 6 of Paris Agreement)	Support with minor exceptions	Working with the Canadian Association of Petroleum Producers and directly with Canadian policy makers and regulators to provide advice on the importance of ITMOs to achieving global GHG reductions.	Enable Internationally Transferred Mitigation Outcomes (ITMOs) under the Paris Agreement. Production of many Canadian products, including oil and natural gas, are at a lower GHG intensity than many competing suppliers globally, meaning that increased Canadian production would help lower global GHG emissions by displacing higher-intensity production.

C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

Yes

C12.3c

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

Trade association

Canadian Association of Petroleum Producers (CAPP)

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

CAPP's Climate Change Policy Principles which CAPP believes should guide Canada's climate change policies: 1) Collaborative and solutions-oriented. Given Canada's climate goals and industry impacts, CAPP will proactively collaborate with governments and stakeholders towards appropriate policy solutions. Policy solutions need to be adaptive and carefully consider environmental, economic, and social outcomes. 2) Efficient, effective and predictable. Climate policy should target reductions where they are most efficient and effective across the entire energy value chain from production to end use, and should fairly consider all sectors and jurisdictions. Climate change policies should achieve emissions reduction at the least cost to Canadians, the economy and industry. Revenues from climate policy should be fully recycled back into the economy to enable innovation, assist transition or reduce other taxes and levies. 3) Technology and innovation focused. Policy should spur technology and innovation to address climate change and capture the opportunity to export solutions to the world. Considerable future emissions reduction will stem from improving the hydrocarbon energy sector, requiring continuing strong innovation and policy effort. 4) Globally competitive. Canada's climate policies must ensure our resource development is cost and carbon competitive with other jurisdictions, especially the U.S. as our largest trading partner. Canada's climate policy leadership should bring proportionate benefits to Canada, including ensuring we receive full value for Canadian energy products through effective access to global markets. Canada is highly dependent on the development and trade of our natural resources, and on our ability to attract foreign investment. Canada's climate policies must be designed to maintain our ability to raise global investment capital.

How have you influenced, or are you attempting to influence their position?

Canadian Natural is working with relevant parties, such as CAPP and Oil & Gas UK, to ensure that new policies encourage technological innovation, energy efficiency, and targeted research and development.

Trade association

Oil & Gas UK.

Is your position on climate change consistent with theirs?

Consistent

Please explain the trade association's position

Efficiency - Policy should be designed to drive efficient actions required to achieve emission objectives. Technology - Policy should stimulate investment in the technologies necessary for significant reductions in GHG emissions. Predictability and stability - Predictable policy built on stable principles should support long term capital investments in the upstream oil and gas sector and create jobs. Distributional fairness - Policy should distribute cost burden equitably among sectors and jurisdictions across the economy. Administrative simplicity - Policy should be simple and minimize the administrative burden on industry to the greatest extent possible.

How have you influenced, or are you attempting to influence their position?

Canadian Natural is working with relevant parties, such as CAPP and Oil & Gas UK, to ensure that new policies encourage technological innovation, energy efficiency, and targeted research and development.

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?

No

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Canadian Natural uses a multidisciplinary risk management process that incorporates climate change risks, including current and potential policies and regulations. We ensure consistency between our climate change strategy/positions and our engagement activities through the following process:

- Management Committee is responsible for the identification, assessment and management of climate change risks.
- GHG Operations Strategy Committee, that is responsible for climate change strategy and issue prioritization, as well as overseeing our working groups that manage and coordinate GHG reduction and technology projects across the company, also assesses and provides input on current and developing GHG policy and regulation.
- Management Committee and the GHG Operations Strategy Committee provide direction and guidance to business units on climate-related risk assessment and project implementation
- Business units conduct reviews to assess any material changes, identify risks and opportunities and to ensure alignment on issues, including climate policy, and reports are shared with Management Committee (and the Board as appropriate). All changes/updates are approved by our President.
- Company representatives from the business units, including the Public Affairs, Government Relations department, take the direction and guidance from Management Committee to ensure consistency in policy advocacy with our climate change strategy. This direction is reflected in our public policy engagement activities, which include company representatives providing input, advice and analysis on potential regulations to policy makers and regulators directly and through participation on industry association working groups/committees.
- Industry associations (e.g. the Canadian Association of Petroleum Producers (CAPP), and Oil & Gas UK) represent the interests of both the energy industry and the broader business community, promoting public policy objectives important to us, our shareholders, Indigenous Peoples and other stakeholders. Our participation as a member of these organizations comes with the understanding that we may not always support every position taken by these organizations or their members. In these situations, we work together to establish common ground.

At Canadian Natural, we believe that strong environmental policy, regulation and performance standards, together with innovation and technology, are necessary for an effective approach to GHG emissions management. We continue to work with industry, government and other stakeholders to maintain a cost and carbon competitive oil and natural gas sector, and we engage proactively in policy and regulation to effectively manage climate risks and opportunities.

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication

In mainstream reports

Status

Complete

Attach the document

Y
w_2019-annual-report_teams.pdf

Page/Section reference

3-4, 39-42

Content elements

Strategy
Risks & opportunities
Emissions figures
Emission targets
Other metrics

Comment

Annual Report, available online at https://www.cnrl.com/upload/report/127/03/w_2019-annual-report_teams.pdf

Publication

In other regulatory filings

Status

Complete

Attach the document

Y
aif-march-27-2019.pdf

Page/Section reference

5-6, 12-19, 36

Content elements

Strategy

Risks & opportunities
Emissions figures
Emission targets

Comment

Annual Information Form available online at <https://www.cnrl.com/upload/report/128/02/aif-march-27-2019.pdf>

Publication

In other regulatory filings

Status

Complete

Attach the document

Y
2019-management_info_circular.pdf

Page/Section reference

A-1, A-5, A-6, A-8, A-9, B-4, 6-12, 26, 33, 34

Content elements

Governance
Emission targets

Comment

Management Information Circular available online at https://www.cnrl.com/upload/report/129/02/2019-management_info_circular.pdf

Publication

In voluntary sustainability report

Status

Underway – previous year attached

Attach the document

Y
2018-stewardship-report-to-stakeholders_small.pdf

Page/Section reference

• 3, 5-9, 11-22, 27-30

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures
Other metrics

Comment

Report to Stakeholders available online at https://www.cnrl.com/upload/media_element/1250/03/2018-stewardship-report-to-stakeholders_small.pdf

Publication

Other, please specify (Corporate website, TCFD Climate Disclosure)

Status

Complete

Attach the document

Y
final---2018-tcf-climate-disclosure-index.pdf

Page/Section reference

All

Content elements

Governance
Strategy
Risks & opportunities
Emissions figures

Comment

Corporate website available at http://webadmin.cnrl.com/upload/media_element/1283/01/final---2018-tcf-climate-disclosure-index.pdf

Publication

Other, please specify (Technology and Innovation Case Studies)

Status

Complete

Attach the document

Y
technology-and-innovation-case-studies-web.pdf

Page/Section reference

All

Content elements

Strategy

Emissions figures
Other metrics

Comment

Corporate website available at https://www.cnrl.com/upload/media_element/1279/05/technology-and-innovation-case-studies-web.pdf

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	President	President

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission
I am submitting my response	Investors	Non-public

Please confirm below

I have read and accept the applicable Terms

RELEASE OF ADDITIONAL DOCUMENTS

After submitting this 2020 Climate Change Questionnaire, Canadian Natural published additional documents that also include responses to climate change and GHG emissions performance for the 2019 reporting year. We are providing here the links to those most current publications:

Publication: 2019 sustainability report

Link to document: <https://www.cnrl.com/report-to-stakeholders>

Publication: 2019 TCFD Climate Disclosure

Link to document: <https://www.cnrl.com/TCFD-index>

Publication: 2019 GRI, SASB and SDG Disclosure Index

Link to document: <https://www.cnrl.com/GRI-SASB-SDG>