



Suncor Energy Inc. CDP Climate Change Questionnaire 2019

C0. Introduction

C0.1

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

Suncor is an integrated energy company headquartered in Calgary, Alberta, Canada. The company is strategically focused on developing one of the world’s largest petroleum resource basins – Canada’s Athabasca oil sands. In addition, Suncor and its affiliates explore for, acquire, develop, produce and market crude oil in Canada and internationally; the company transports and refines crude oil, and markets petroleum and petrochemical products primarily in Canada. The company also conducts energy trading activities focused principally on the marketing and trading of crude oil, natural gas, power and byproducts. Suncor also operates a renewable energy business as part of its overall portfolio of assets.

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
Row 1	January 1, 2018	December 31, 2018	No

C0.3

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

- Canada
- United States of America

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 consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.

Operational control

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

Downstream

Other divisions

Biofuels

Grid electricity supply from gas

Grid electricity supply from renewables

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
Board-level committee	The Board oversees Suncor’s Enterprise Risk Management Program (the “ERM Program”). In accordance with this program, the CEO and senior management undertake a process to identify, assess and mitigate significant risks. The Board undertakes an annual review of those risks identified by the ERM program as principal risks (exposure that has the potential to impact or impair the ability of the company to meet its strategic objectives) which includes carbon risk. The Board monitors risk management actions for these risks throughout the year. In addition to Board oversight of risk management efforts, each principal risk is mapped to a Board Committee. Carbon risk is mapped to the Environment, Health, Safety and Sustainable Development Committee of the Board.

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	Please explain

<p>Scheduled – some meetings</p>	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Reviewing and guiding annual budgets</p> <p>Reviewing and guiding business plans</p> <p>Setting performance objectives</p> <p>Monitoring implementation and performance of objectives</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>One of the Board’s major duties is to review with management Suncor’s mission, objectives and goals and the strategies and plans for achieving them. The Board also monitors Suncor’s progress toward its strategic goals and plans, and revises Suncor’s direction where warranted.</p> <p>The Board oversees Suncor’s Enterprise Risk Management Program (the “ERM Program”). In accordance with this program, the CEO and senior management undertake an enterprise-wide process to identify, assess and mitigate significant risks. The Board undertakes an annual review of those risks identified by the ERM program as principal risks (exposure that has the potential to impact or impair the ability of the company to meet its strategic objectives) which includes carbon risk. The Board monitors risk management actions for these risks throughout the year. In addition to Board oversight of risk management efforts, each principal risk is mapped to a Board Committee. Carbon risk is mapped to the Environment, Health, Safety and Sustainable Development Committee of the Board, and this committee receives quarterly reports from management.</p> <p>The Board is also responsible for ensuring Suncor has an effective strategic planning process, and on an annual basis reviews Suncor’s annual business plan (including Suncor’s annual capital budget) and in doing so endorses the strategies reflected in Suncor’s long range plan. The Governance Committee provides assistance to the Board by annually assessing Suncor’s planning and budgeting process.</p>
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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)	Responsibility	Frequency of reporting to the board on climate-related issues
Chief Sustainability Officer (CSO)	Both assessing and managing climate-related risks and opportunities	Quarterly
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	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).

The Chief Sustainability Officer (CSO) is a member of the executive leadership team that reports directly to the CEO and President of Suncor. The CSO also has a direct link to the Environment, Health, Safety & Sustainable Development (EHS&SD) Committee of the Board of Directors.

The CSO is the highest-level management position below the board level where the most significant climate-related issues ultimately are managed. The fact that Suncor has created a CSO position demonstrates Suncor's commitment to have significant and dedicated resources responsible for the material sustainability issues facing Suncor, including climate-related issues.

The CSO serves as the bridge between Management and the Board on carbon risk. As such, the CSO has the responsibility of communicating Suncor's carbon risk and mitigation measures to the Board and, conversely, translating the strategic direction from the Board into corporate action. The CSO has a direct link to the Environment, Health, Safety & Sustainable Development (EHS&SD) Committee, which is a committee of to the Board of Directors. The EHS&SD Committee's responsibilities include monitoring the effectiveness and integrity of Suncor's internal controls as they related to operational risks of the corporations physical assets and other matters relating to the environment, health, safety and sustainable development. The Committee is also responsible for the review of the policies and practices of the Corporation respecting operational risks as they relate to climate change.

An example of one of the CSO's monitoring processes occurs within the EHS&SD committee at Suncor. This committee is responsible for the review of the policies and practices of Suncor in terms of operational risks, including more related to climate change. This includes assessing the risks and

impacts of climate change issues on the Corporation's current business and growth plans, reviewing the impacts of emerging climate legislation and regulations and reviewing the Company's disclosures on carbon risk.

C1.3

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

Yes

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).

Who is entitled to benefit from these incentives?

Chief Executive Officer (CEO)

Types of incentives

Monetary reward

Activity incentivized

Energy reduction project

Comment

We incentivize GHG performance by progressing projects that get us closer to our GHG goal (e.g. fuel switching, in situ pilots, renewables) and these are reflected in the business unit "growth" component of the AIP.

Who is entitled to benefit from these incentives?

Business unit manager

Types of incentives

Monetary reward

Activity incentivized

Energy reduction project

Comment

We incentivize GHG performance by progressing projects that get us closer to our GHG goal (e.g. fuel switching, in situ pilots, renewables) and these are reflected in the business unit "growth" component of the AIP.

Who is entitled to benefit from these incentives?

Other, please specify

Facility Managers and Business Unit Managers

Types of incentives

Recognition (non-monetary)

Activity incentivized

Other, please specify

Emissions reductions related "growth" project

Comment

The President's Operational Excellence Awards (POEAs) recognize and celebrate employees and contractors who demonstrate high-quality, innovative thinking at Suncor. From managing costs, risks, safety and reliability to minimizing our environmental impacts, nominees demonstrate what can be accomplished when we work together in a disciplined way.

C2. Risks and opportunities

C2.1

(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.

	From (years)	To (years)	Comment
Short-term	0	1	Risk time horizons are consistent with Suncor’s Risk Management Standard.
Medium-term	1	10	Risk time horizons are consistent with Suncor’s Risk Management Standard.
Long-term	10	25	Risk time horizons are consistent with Suncor’s Risk Management Standard.

C2.2

(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

C2.2a

(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	Carbon risk is included as one of the company’s principal risks, an exposure with potential to materially impact Suncor’s ability to meet or support its strategic objectives. Besides undergoing an annual Board review, carbon risk is also mapped to the EHS&SD Board Committee for oversight which meets quarterly to review effectiveness of our EHS policies and oversees management systems that support policy



			<p>compliance. The CEO holds top executive responsibility for sustainability. At an enterprise-wide level, we use scenario planning that extends to 2040 to assess the resilience of our business strategy over the long term (out to 2040). We also test our whole portfolio of businesses against our long-term GHG goal.</p>
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C2.2b

(C2.2b) Provide further details on your organization’s process(es) for identifying and assessing climate-related risks.

Carbon risk is considered one of Suncor’s principal risks. A principal risk is generally considered to be an exposure that has the potential to materially impact Suncor’s ability to meet or support its strategic objectives.

As a principal risk, carbon risk receives oversight from the full Board and executive management and systems are in place to mitigate potential impacts. As such, it undergoes an annual Board of Directors review as a principal risk. Carbon risk is also brought forward to the Environment, Health, Safety and Sustainable Development (EHS &SD) Committee of the Board for oversight. Additional reviews are completed by the executive leadership team through the year.

Each year, as part of our normal business planning process, a base case carbon price outlook is developed, taking into account existing regulations and the expected trajectory of those regulations as they apply to our assets.

The company business plan, investments and all capital decisions are tested against a range of variables, including our base and alternative carbon price outlook, to ensure an expectation of a competitive rate of return over the asset life. In 2018, we also developed an alternative case that takes a much higher view of future carbon prices. This alternative case serves as a “stress test” and adds confidence to capital decisions.

Suncor uses a risk matrix based on likelihood and consequence to identify different types of risk to the organization including environmental and financial impacts. Suncor assumes substantive financial impacts are possible in high risk situations. High risk situations begin when the financial consequences could be \$10 million of impact or greater.

C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Existing and future laws and regulations can impose significant liabilities on a failure to comply with their requirements. Concerns over climate change and fossil fuel extraction could lead governments to enact additional or more stringent laws and regulations applicable to Suncor and other companies in the energy industry in general. Each year, a carbon price outlook is developed, taking into account existing regulations and the expected trajectory of those regulations as they apply to our assets. Investments and capital decisions are tested against a range of variables, including our carbon price outlook, to ensure an expectation of a competitive rate of return over the asset life. Examples of current legislation imposing a cost on carbon include the Alberta Climate Leadership Act and the Alberta Carbon Competitiveness Incentive Regulation (CCIR). The cost of this legislation is built into Suncor's economic evaluations.
Emerging regulation	Relevant, always included	Future laws and regulations may impose significant liabilities on a failure to comply with their requirements. Concerns over climate change and fossil fuel extraction could lead governments to enact additional or more stringent laws and regulations applicable to Suncor and other companies in the energy industry in general. Each year, a carbon price outlook is developed, taking into account existing regulations and the expected trajectory of those regulations as they apply to our assets. Investments and capital decisions are tested against a range of variables, including our carbon price outlook, to ensure an expectation of a competitive rate of return over the asset life. New carbon pricing and clean fuel regulations are being developed in several jurisdictions in which Suncor operates.
Technology	Relevant, always included	Technology is included in the annual risk assessment process of Suncor. Suncor incorporates technology into scenario planning, and uses three scenarios encompassing different degrees of technological change. A review of the existing portfolio of GHG reduction technologies is also included in the annual risk assessment process. In 2018, Suncor invested approximately \$635 million in technology development and deployment and digital technologies as part of a robust strategy to optimize current assets and develop next-generation facilities.
Legal	Relevant, always included	Suncor undertakes a corporate-wide process to identify, assess and report on significant risks including carbon as a principal risk. Our assessment is supported by a carbon price outlook, which highlights regulations and their expected trajectory, as they apply to our assets. The risk assessment includes a review of financial, reputational, and regulatory

		impacts on Suncor’s business, including the potential implications of climate litigation.
Market	Relevant, always included	As part of its ongoing business planning, Suncor assesses potential future costs associated with CO2 emissions in its operations and the evaluation of future projects, based on the company’s outlook for the carbon price under current and pending GHG regulations. Suncor evaluates the potential impact of future carbon-constrained scenarios on its business strategy. The annual assessment of carbon risk as a principal risk takes into account demand destruction of fossil fuels due to changing societal trends and alternative energy incentives and mandates.
Reputation	Relevant, always included	Suncor undertakes a corporate-wide process to identify, assess and report on significant risks including carbon as a principal risk. The risk assessment includes a review of financial, reputational, and regulatory impacts on Suncor’s business, including increasing public opposition to fossil fuels, and oil sands in particular.
Acute physical	Relevant, always included	In general, Suncor’s operations are subject to operational hazards and risks such as, among other things, icebergs, hurricanes, fires (including forest fires), severe winter climate conditions, prolonged periods of extreme cold or extreme heat, flooding, droughts, and other extreme weather conditions. Operational plans, business continuity plans, and insurance are all tools used to mitigate these risks. As an example, Suncor currently mitigates pack ice and iceberg risk through the design of its facilities and with its emergency response system. A continuous monitoring system tracks iceberg locations and makes projections of the expected course of the icebergs. Where an iceberg cannot be diverted, an emergency response system allows for the floating platform to be disengaged and moved to safer water, protecting the asset but resulting in production disruption. These methods lessen the likelihood and magnitude of the risk. For tropical cyclones, a continuous weather tracking service monitors storm systems in the North Atlantic.
Chronic physical	Not relevant, explanation provided	Chronic risks such as rising sea level and region changes in rainfall and temperature do not pose a risk to Suncor’s operations. The risks of constraints such as water withdrawal restrictions due to drought have been evaluated and not considered to be a risk to operations.
Upstream	Relevant, always included	Suncor undertakes a corporate-wide process to identify, assess and report on significant risks including carbon as a principal risk. Suncor tracks its GHG performance enterprise-wide and applies its carbon price outlook to both upstream and downstream assets.
Downstream	Relevant, always included	Suncor undertakes a corporate-wide process to identify, assess and report on significant risks including carbon as a principal risk. Suncor tracks its GHG performance enterprise-wide and applies its carbon price outlook to both upstream

		and downstream assets.
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C2.2d

(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.

Suncor undertakes a corporate-wide process to identify, assess and report on significant risks including carbon as a principal risk. Carbon risk receives oversight from the full Board and executive management and systems are in place to mitigate potential impacts. Our assessment is supported by a carbon price outlook, which highlights regulations and their expected trajectory, as they apply to our assets.

Suncor's Enterprise Risk Management (ERM) process employs a corporate risk matrix to assess and prioritize all risks/opportunities using a common measure of impact and consequence; these include reputational, financial and environmental. To prioritize the risks and opportunities, our investments and capital decisions are tested against a range of variables, including alternative future energy scenarios and our carbon price outlook to ensure an expectation of a competitive rate of return over the asset life.

Suncor assesses specific risks to its physical assets in light of various potential operational hazards to which those assets may be subject, including the risk of extreme weather events in the areas where we operate. Suncor manages these risks through facility design and operational procedures. We also maintain insurance, as appropriate, for damage to, or loss of, assets as well as production interruption.

One activity to support the assessment of transitional risks and opportunities is Suncor's use of three long-term energy futures scenarios. Each scenario is plausible and could affect our operating environment and business strategy in markedly different ways. Signposts and milestones are monitored to identify critical shifts in the external context. Signposts include changes in global energy demand and supply mix, political and economic indicators, climate data and policy trends, and also include technology advances and consumer trends.

- Company level: The Enterprise Risk Management (ERM) process assesses key strategic risks/opportunities including carbon risk. The Board conducts an annual review of principal risks and management's mitigation actions. A Strategic Issues Management Process integrates stakeholder, reputational, public policy context to support the ERM program. An annual carbon price outlook incorporates existing regulations and expected cost trajectories into the economic evaluation of projects and assets. An internal process for project and asset development incorporates a review of climate change implications early in the process and prior to a commitment of significant resources. We test our oil sands business and growth strategy against our three long term energy scenarios. An environmental engineering team, corporate technology

development team, corporate strategy team and capital portfolio management team coordinate company-wide strategy for energy efficiency and advancing carbon reduction technology.

- Asset level: Business units annually assess key business risks/opportunities at the facility level, including climate change. The output of this process escalates to the corporate & ERM process. Potential physical risks posed by the effects of climate change are addressed at a facility level. GHG emission forecasts are developed by facilities to understand the potential impact of identified risks allowing them to optimize their planning

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

Transition risk

Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Suncor's operations in British Columbia are subject to a carbon tax which is set at \$35/t for 2018. Suncor's Alberta operations are subject to the Carbon Competitiveness Incentive Regulation (CCIR) in 2018 which imposed a carbon price of \$30/t on emissions beyond an ambitious government-set performance target (called the Output Based Allocation or OBA). Facilities that perform better than the OBA can generate and sell credits within this system. Where physical GHG reductions cannot be made at the facility, compliance may be achieved through a combination of offsets, emission performance credits or payment into a provincial technology innovation fund. Alberta oil sands facilities are also subject to a combined Emissions Limit of 100 Mt, which is driving increased investment in and deployment of new technology to collectively remain under the cap. In 2018 Suncor's refineries in Quebec and Ontario (Ontario cap and trade act was repealed on October 31, 2018) were regulated under a cap and trade program linked to the Western Climate Initiative (WCI) cap and trade program. Regulated refining facilities receive an allowance allocation that aligns with a benchmark performance and takes into account competitiveness in a trade-exposed context. Fuel suppliers are required to purchase allowances to cover the tail pipe emissions of all fuel sold, the cost of which is largely passed through to the consumer, thus acting as a carbon price on fuel consumption. In Newfoundland and Labrador, the provincial government is developing carbon pricing regulations that will apply to Suncor's operated Terra Nova offshore operation. The Canadian federal government developed "backstop" legislation, called the Output Based Pricing System that will take effect in 2019 for any jurisdictions without provincial or territorial carbon pricing mechanisms.

Time horizon

Current

Likelihood

Very 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)**Potential financial impact figure – minimum (currency)**

94,000,000

Potential financial impact figure – maximum (currency)

187,000,000

Explanation of financial impact figure

Based on the outlook for new emissions regulations, we have updated our cost estimates. The production weighted average after-tax cash cost per barrel of global production over the period 2019 to 2028 has increased from 2018 and is now estimated at an average of \$0.70 per barrel.

Management method

Suncor's GHG intensity reduction goal of 30% by 2030 drives energy efficiency, fuel switching opportunities, and technology advancement. Suncor's technology strategy is driving step-change innovation to reduce GHG intensity in bitumen production and processing. COSIA's GHG technology strategy is to accelerate deployment of step-change technology. We continue to generate offset credits from our wind and cogeneration assets to reduce GHG compliance costs at other facilities. Where efficiency improvements and Emission Performance Credits from our other operations do not cover compliance requirements, Suncor purchases compliance instruments at competitive prices.

Cost of management

2,000,000

Comment

Risk Name: Escalating Climate-Related Regulatory Costs and Constraints

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

Type of financial impact

Reduced revenue from decreased production capacity (e.g., delayed planning approvals, supply chain interruptions)

Company- specific description

Changes in public perception of integrated oil and gas companies and their operations may pose issues related to development and operating approvals or market access risk for products, which may have a material adverse effect on Suncor's business, financial condition, results of operations and cash flow. Based on data presented by Environment and Climate Change Canada, notwithstanding that Canada's oil sands proportionate share of global emissions is less than 0.2%, the development of the oil sands has figured prominently in politics, media and activist commentary on the subject of climate change. According to an IHS study, while emissions intensity has decreased over the past decade for oil sands production, oil sands refined products range between 1% - 19% higher carbon intensity on a well-to-wheels basis than products from conventional crudes. Planned growth projects to meet global energy demand may increase Suncor's absolute emissions in the next decade. Reputational damage related to GHG emissions may directly or indirectly affect the profitability of our current oil sands projects and the viability of future oil sands projects in a number of ways, including: a) creating regulatory uncertainty that challenges economic modelling of future projects and potentially delays sanctioning; b) motivating more onerous emissions regulation of those projects that could result in changes to facility design and operating requirements, thereby potentially increasing the cost of construction and operation; and c) legislation or policy that limits the purchase of oil sands crude oil by governments and other institutional consumers that, in turn, limits the market for this crude oil and reduces its price.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

0

Potential financial impact figure – maximum (currency)

8

Explanation of financial impact figure

A potential cost to the oil sands industry associated with climate change reputation risk is the price differential between bitumen & lighter oils caused by delays in approval of new pipelines intended to provide access of oil sands bitumen to tidewater and international markets.

Please note that the range "0 to 8" identified in the potential financial impact is \$0/bbl to \$8/bbl.

Management method

Market access risk is substantially mitigated by Suncor's integrated business model where we process much of our bitumen in our own upgraders & refineries thereby avoiding the bitumen discount. Reputational risk is best managed through improved environmental performance. Our oil sands operation's energy efficiency initiatives have demonstrated tangible reduction in energy intensity since 1990. We continue to make long term tech investments towards step changes in in-situ production emissions intensity. Activities include various efforts to collaborate in industry initiatives (e.g. COSIA); our support of various academic & engineering research organizations to understand the lifecycle emissions of oil sands products; and consistent engagement with media/public to deliver factual and balanced information in a relevant and understandable format. These actions allow us to create a space for balanced dialogue. Studies have demonstrated that oil sands refined products, on a well-to-wheels basis, are on average 1% - 19% higher carbon intensity than average conventional crude-based refined products. Hence, oils sands refined products are on par with the refined products made from many international heavy crude oils including Venezuela and California.

Cost of management

500,000

Comment

Risk Name: Increased Stakeholder Expectations

Cost of Management: Estimated costs associated with studies to ascertain the Life Cycle emissions of oil sands crudes total approximately \$500,000

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Customer

Risk type

Transition risk

Primary climate-related risk driver

Reputation: Shifts in consumer preferences

Type of financial impact

Reduced revenue from decreased demand for goods/services

Company- specific description

Suncor produces refined products, marketed through our Petro-Canada retail network. Potential for consumer behaviour changes, as a result of increasing availability of non-fossil fuel alternatives such as electric vehicles, could reduce the demand for Suncor's fossil fuel based refined products. Additionally, continued efficiency improvements in transportation miles per gallon, consumer preference for improved vehicle efficiency, and increasing public perception of the impacts of climate change and its purported link to fossil fuel products could reduce demand for Suncor refined products. However the low global price of oil created conditions that resulted in record auto sales in N. America with a strong trend towards larger vehicles. These vehicles are expected to remain part of the global fleet for at least a decade. Downstream, we expect to see a modest decline in demand for gasoline in North America over the next 10 years, accelerating towards 2030. Long-term gasoline demand is expected to be moderated by efficiency improvements in internal combustion engines and increased uptake of biofuels as well as hybrid and electric vehicles. However, we believe cost, consumer familiarity and carbon competitiveness mean liquid fuels will remain the primary fuel

source of vehicle mobility for many years to come. Mitigating this trend, we expect that older, inefficient refining capacity will be taken out of commission in the future, somewhat balancing North American supply and demand. Retention of market share in refined product sales will become critical, likely resulting in tight retail margins in North America. However, both refined products and crude oils are easily transported into global markets. We expect the global oil demand will continue to grow to 2040 due to population growth, urbanization and increased living standards, but decline as a percentage of the global energy consumption mix.

Time horizon

Medium-term

Likelihood

More likely than not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

0

Potential financial impact figure – maximum (currency)

1,000,000,000

Explanation of financial impact figure

In 2018, our refining and marketing business contributed net earnings of \$3.153 bln, making it a significant contributor to the company's profitability. Some of this margin would be at risk if demand for refined product decreases.

Management method

Suncor has a diversified portfolio which includes a renewable energy business. Suncor supports initiatives to gain access to new international markets in the next 5-10 yrs for our crude oil and refined products. We operate Canada's largest ethanol plant by volume & as of the end of 2018 are involved in 4 wind projects (111MW capacity). Our renewables business provides first-mover advantage as consumer behaviour changes increases demand for renewable energy. We monitor alternative transportation technology and are well-positioned to invest in the provision of low carbon transportation fuels once reliability, value and environmental attributes support consumer preference shift. Suncor has supported the development of pipeline infrastructure that would improve market access & operations flexibility for our oil sands bitumen. Suncor & other oil sands companies have implemented rail as a bridging solution. The large-scale movement of oil by rail is more costly & more carbon intensive and less safe than pipeline. Expanded pipeline links are the most efficient way to transport oil sands crude to market, given the sizable capacity advantage of pipelines, & their overall safety & reliability record. Notwithstanding the forecast for a robust hydrocarbon fuels market, Suncor has begun offering electric vehicle charging at some Petro-Canada stations to provide a retail offering to electric vehicle owners.

Cost of management

0

Comment

Risk Name: Changing Consumer Behaviour

Cost of Management (\$0): Suncor does not incur direct costs associated with increasing market access for our products. Costs associated with supporting market access and monitoring transportation fuel developments and demand are integral to our business and not material. Our renewables business is operated as a revenue-generating business.

Identifier

Risk 4

Where in the value chain does the risk driver occur?

Direct operations

Risk type

Physical risk

Primary climate-related risk driver

Chronic: Changes in precipitation patterns and extreme variability in weather patterns

Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

Company- specific description

Suncor's upgrader facility in the Athabasca region of Northern Alberta and Suncor's refineries in Montreal, Sarnia, Edmonton and Commerce City sometimes operate in harsh weather environments, subject to expected periods of extreme cold in the winter, heat waves in the summer, and increased fire risk. The risk to Suncor is that prolonged periods of extreme cold could force these facilities to shut down for periods of time to ensure worker safety and prevent undue stress on equipment. Prolonged periods of extreme heat may lead to production cuts if adequate supply of cooling water is not available. Suncor's refineries at Montreal and Sarnia have access to extremely large bodies of cooling water, so are far less exposed. This risk exists now and into the very long term > 50 yrs. Terra Nova, Suncor's only operated offshore installation, off the coast of Newfoundland, operates on the edge of the Atlantic Windstorm Zone, an area that is subject to icebergs. There is a risk in the region of floating icebergs causing damage to our installations. This area is also subject to hurricanes. In the winter these events can create conditions that require production equipment and personnel to be moved onshore and production to be shut-in for a period of time. These known risks exist now and for the expected life of the field.

Time horizon

Current

Likelihood

About as likely as not

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

0

Potential financial impact figure – maximum (currency)

6,057,000

Explanation of financial impact figure

Prolonged periods of extreme weather have the potential of disrupting production, costing millions of dollars in lost revenue. The likelihood of extreme weather events remains unknown, but through our risk management processes, we expect the magnitude of impact to remain low-medium for the foreseeable future, even if increases in extreme temperature or weather variations occur.

Management method

Many of Suncor's facilities routinely operate in an annual temp range of -40 to +40 degrees C and facilities are built to withstand extreme weather events. However, in the event of more frequent or prolonged temp extremes, additional capital expenditure may be required to install more robust equipment, warming sheds, or water cooling processes. Suncor currently mitigates pack ice and iceberg risk through the design of its facilities and with its emergency response system. Activities: A continuous monitoring system tracks iceberg locations and makes projections of the expected course of the icebergs. Where an iceberg cannot be diverted, an emergency response system allows for the floating platform to be disengaged and moved to safer water, protecting the asset but resulting in production disruption. These methods lessen the likelihood and magnitude of the risk. For tropical cyclones, a continuous weather tracking service monitors storm systems in the North Atlantic. An emergency response system allows for critical equip and personnel to be brought ashore and for the floating platform to be disengaged and moved to safer water, protecting the asset but resulting in production disruption. Physical risks are primarily managed by the operations at a business-unit and facility level. We also maintain insurance, as appropriate, for damage to, or loss of, assets as well as production interruption, with the exception of insurance coverage for Named Windstorms.

Cost of management

1,000,000

Comment

Risk Name: Extreme Weather Events

Type of Financial Impact: Increased operating costs (e.g., inadequate water supply for hydroelectric plants or to cool nuclear and fossil fuel

plants)

Potential Financial Impact (\$0/day to \$6,057,000/day) Note: This is a range of daily cost based on the loss of production due to Terra Nova completely shutting down their production.

Cost of Management (\$1,000,000) Note: There are no additional costs for action to protect against temperature extremes. The cost of management of the operations' physical risk mitigation is in place for the life of the asset. As these programs are applicable to multiple risks it is difficult to apportion a specific cost to managing climate-specific physical risk. The cost of iceberg tracking is shared by operators in the region, and thus the direct costs to Suncor are proportionately shared. The cost of the tracking program is shared by operators in the region and thus direct costs to Suncor are proportionately shared.

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?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Suncor continues to evaluate new opportunities across Canada to further build on its renewable energy portfolio. Wind power generation creates business opportunities for merchant sale of power to the grid and generation of carbon offset credits that can be used by Suncor or sold on the market. Currently, in Alberta, a wind development protocol exists which allows the developer to generate offset credits to be sold or used as a compliance option under the Alberta Climate Change and Emissions Management Act. Of Suncor's 111 MW installed wind energy capacity, 60 MW are situated in Alberta. This protocol provides the opportunity for Suncor to create offsets which reduce the compliance costs for other operations under this regulation through its renewable energy operations. Additionally, carbon pricing in major Canadian jurisdictions is making wind power more profitable as jurisdictional targets add additional renewable power. At the same time, the cost of wind power generation continues to decrease, making unsubsidized wind power cost-competitive in most jurisdictions.

Time horizon

Current

Likelihood

Very 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)

Potential financial impact figure – minimum (currency)

2,200,000

Potential financial impact figure – maximum (currency)

3,300,000

Explanation of financial impact figure

In 2018, Suncor and our partners have an interest in four wind power facilities. Combined, these facilities have a gross generating capacity of 111MW, enough to power about 52,000 Canadian homes and avoid approximately 110,000 tonnes of carbon emissions each year. The offsets produced by our wind facilities in Ontario and Saskatchewan are retained by the government. The financial value of our offsets in Alberta is approximately \$2.2 million to \$3.3 million/year. These offsets can be used by Suncor to offset its compliance costs..

Strategy to realize opportunity

In 2018, compliance obligations for our oil sands facilities were met partially through internally generated wind energy offset credits from Suncor's wind energy projects in Alberta, generating revenue for the renewables business. Each year, Suncor calculates the tonnage of offsets generated under the protocol and submits an application under the protocol. This management method highlights the benefit of Suncor's integrated value chain as the value of offsets has been increasing with time.

Cost to realize opportunity

0

Comment

Name of Opportunity: Increasing Renewable Energy Demand

Cost of Management Note: Wind operations area profit generating business. We experience minimal management costs associated with creating the offset credit (measurement, documentation, application) because the power is metered.

Identifier

Opp2

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Suncor complies with all Renewable Fuel Standards (RFS) in the jurisdictions within which we operate and markets fuel products. Regulatory requirements for renewable fuel such as the RFS present potential revenue opportunities for Suncor in biofuels. Governments across North America are mandating the use of ethanol in transportation fuels. Canadian regulations require an average 5% renewable fuel content in gasoline; proposed Canadian regulations also require an average annual 2% renewable content in diesel fuel. Some provincial regulations require a higher percentage blending, and others have introduced other systems such as a Low Carbon Fuel Standard or a Cap and Trade system. Suncor owns and operates the largest ethanol plant in Canada, and virtually all of the output is blended into gasoline and marketed under the Petro-Canada brand. In 2019, we invested in Enerkem Inc. which manufactures biofuels and renewable chemical products from household garbage that would otherwise be landfilled. In addition to a financial investment, a number of Suncor employees have been seconded to Enerkem's pilot facility in Edmonton.

Time horizon

Medium-term

Likelihood

Likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

480,000,000

Potential financial impact figure – maximum (currency)

600,000,000

Explanation of financial impact figure

In 2018, Suncor biofuel operations produced 402,000 L of ethanol. Throughout 2018, the spot price for ethanol ranged from US\$1.20 to US\$1.50. The resulting revenue opportunity ranged from \$480M to \$600M in 2018.

Strategy to realize opportunity

Suncor expects that RFS will be amended to increase the required level of biofuel, creating a stable and increasing market for biofuels. Suncor manages this opportunity by continuously evaluating business and technology opportunities to expand into next generation biofuels markets to take advantage of renewable fuel standards and reduced carbon intensity. This could help to increase the magnitude of biofuels production/blending over the medium-long term (5-10 yr timeframe). Suncor has been blending ethanol in our retail fuels since 1992; Suncor's St. Clair Ethanol plant expanded capacity to 400 million litres per year in an effort to meet this growing North American demand.

Cost to realize opportunity

0

Comment

Name of Opportunity: Increasing Biofuels Demand

Cost to Realize Opportunity Note: Suncor's biofuels business is a profit generating business. There is no net management cost.

Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

Suncor supports the use of offsets as compliance mechanisms under existing and proposed climate change regulations. Suncor has actively engaged in the development of offset protocols where it sees opportunities to either purchase quality offsets in the market, or create offsets in our own operations. In addition to the renewable energy production (see Renewable Energy Demand opportunity in section C2.4a, above), Suncor uses natural gas cogeneration (80% efficient) to provide combined steam and power to their own facilities and exporting surplus power to the grid to displace more carbon-intensive coal-fired generation or natural gas combined cycle generation (40% efficient). Suncor operates 1.1 GW of cogeneration with surplus capacity sold to the power grid. Where surplus power is exported to the grid, Suncor is able to earn offset credits on the difference between a grid intensity level reflecting the efficiency of the cogeneration unit and a performance standard associated with natural gas combined cycle generation. This presents an opportunity for Suncor through reduction of compliance costs because these offset credits may be used as compliance instruments under the Alberta Carbon Competitiveness Incentive Regulation (CCIR). Additionally, due to the must-run nature of our operations, the cogenerated power sold to the grid is highly reliable compared to other forms of generation, reducing the overall pool price for power benefiting Alberta residents. Over the past few years, Suncor has developed its internal carbon marketing capability which has helped to reduce our overall compliance cost. Suncor has an opportunity with cap and trade schemes to stimulate research and innovation in energy efficiency; earn revenue from investments made to reduce our own emissions; improve the economics of the reduction project; and develop internal capability to understand the carbon trading markets.

Time horizon

Current

Likelihood

Virtually certain

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

0

Potential financial impact figure – maximum (currency)

12,000,000

Explanation of financial impact figure

Suncor's facilities occasionally generate carbon offset credits. The bulk of these credits are generated and used in the Alberta carbon market. In 2018, a policy change resulted in zero emission performance credits (EPCs) for Suncor's oil sands and in situ operations. With ongoing policy changes, the range of the financial impact represents our experience with EPCs.

Strategy to realize opportunity

Suncor manages this opportunity through measurement, reporting, and receipt of emission performance credits, as well as a regular review of its operations for the potential to generate additional offset credits. The deployment of cogeneration technology in Suncor's in-situ facilities continues to have a significant positive impact such that Suncor can directly control its production, maintain energy security, earn emission performance credits through the sale of competitively priced surplus power and reduce the carbon intensity of the provincial electricity grid. The power sales opportunity has led to the establishment of a real time power trading desk to capture full value of the power sold to the electricity grid

Cost to realize opportunity

400,000

Comment

Name of Opportunity: Carbon Credit Offset Generation

Cost to Realize Opportunity Note: Internal capability is provided by corporate and facility based personnel with multiple duties. Total workload is approximately 2 FTE.

Identifier

Opp4

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

Type of financial impact

Reduced operating costs (e.g., through efficiency gains and cost reductions)

Company-specific description

There is a natural incentive to reduce energy use. The acceleration of technological innovation to substantially change production processes and reduce GHG emissions in our operations is expected to lower energy use and, therefore, lower energy costs. The same technology that reduces energy consumption could also allow for easier and more cost effective extraction of complex unconventional resources.

Time horizon

Short-term

Likelihood

More likely than not

Magnitude of impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

26,000,000

Potential financial impact figure – maximum (currency)

52,000,000

Explanation of financial impact figure

Energy costs are the single largest input cost in our business. We estimate that a fuel efficiency improvement of 10% to 20% will reduce natural gas costs in Suncor's production of bitumen (mining and in situ) by \$26M to \$52M per year. Technology improvements have the possibility of reducing other costs, as well, such as GHG compliance costs, water treatment costs, etc.

Strategy to realize opportunity

One method Suncor utilizes for managing technological advancements is by being a strong advocate for carbon policy that promotes accelerated technology development. Suncor is a founding member of COSIA, a 9 member organization seeking to develop and share intellectual property on environmental technology in the oil sands. Through collaboration centered around a common interest like environment and technology stewardship, Suncor and partners are able to pool resources with the goal of making significant advancement over acting alone. As a result, we expect to see advancements benefiting the environment over the next 2-10 yrs. For example, we have been working with COSIA, to advance a regional approach to industry-wide water management practices. Over the last several years we made significant

progress in taking our water strategy from the planning stage to implementation.

Suncor is an active member of the CRIN, which aims to position Canada as a global leader in producing clean hydrocarbon energy from source to end use. The network brings together the oil and gas industry, innovators, investors, start-ups, policy-makers, incubators and accelerators, researchers and students. It facilitates the connections to advance technologies for use in Canada and with the potential for export to global markets emphasizing the potential impact that our country can make to help address global challenges.

Cost to realize opportunity

30,000,000,000

Comment

Name of Opportunity: Low-Carbon Technology With Adjacent Industries and development of new technologies

Cost to Realize Opportunity Note: Suncor invested approximately \$635 million in technology development and deployment, and digital technologies as part of a robust strategy to optimize current assets and develop next-generation facilities in 2018.

Identifier

Opp5

Where in the value chain does the opportunity occur?

Customer

Opportunity type

Products and services

Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

Type of financial impact

Increased revenue through demand for lower emissions products and services

Company-specific description

With increasing consumer uptake of EVs, there is an opportunity to offer customers EV supercharging and increase traffic in Petro-Canada's convenience stores

Time horizon

Current

Likelihood

Very likely

Magnitude of impact

Low

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

In 2019, Petro-Canada announced plans to build 50 EV fast charging stations at existing Petro-Canada stations along the TransCanada Highway, throughout Canada. At the outset, EV charging will be offered for free, to increase awareness of the EV charging network. Once the market is better understood (both consumer choices and regulations), a fee may be levied for EV charging. Increased traffic to Petro-Canada convenience stores drives improved sales.

Strategy to realize opportunity

Cost to realize opportunity

Comment

C2.5

(C2.5) Describe where and how the identified risks and opportunities have impacted your business.

	Impact	Description
Products and services	Impacted	As identified in in C2.4a, the opportunities associated with renewable energy, biofuels, carbon credits, and electric vehicle charging have altered how Suncor calculates the business value with investing in projects that produce any of these products. The magnitudes of the impacts for the four opportunities are: medium-low for renewable energy, medium for biofuels, low for carbon credits, and low for EV charging.
Supply chain and/or value chain	Impacted for some suppliers, facilities, or product lines	Novel energy efficient technologies are increasingly becoming available to the supply chain of the oil and gas industry. Some of these technologies have been designed for this industry while others have been adapted from adjacent industries; companies that are best able to recognize and move quickly on the most relevant and impactful of these technologies have a competitive advantage. In situations where Suncor’s operations generate carbon offset credits (either Emissions Performance Credits or Offset Credits), consideration as to how best to deploy and monetize these credits has impacted decisions made in the value chain of projects; it has created the potential for an additional revenue stream if managed correctly. The magnitude of the impacts from the risks and opportunities associated with the incremental changes in the supply chain are small compared to the costs and revenues associated with Suncor’s oil production.
Adaptation and mitigation activities	Impacted	Adaptation - Many of Suncor’s facilities routinely operate in extreme temperatures and facilities are built to withstand extreme weather events. The magnitude of the impacts from the adaptations risks has resulted in minimal impact on activities associated with extreme weather events. Mitigation - Energy cost is one of Suncor’s largest production inputs and therefore there is a natural business

		<p>incentive to reduce overall energy use and emissions.</p> <p>The magnitude of the impacts from mitigation opportunities have resulted in changes in operation and sustaining capital spend on the order of several million dollars per year.</p>
Investment in R&D	Impacted	<p>In addition to investment in collaborative and venture capital structures, Suncor invested approximately \$635 million in 2018 in technology development and deployment, and digital technologies to optimize current assets and develop next-generation facilities. We believe technology and energy innovation has the potential to move emissions reduction from incremental to step change improvement</p> <p>We are advancing a portfolio of in situ technologies with the goal of lowering the carbon intensity of producing bitumen and improve cost competitiveness. We believe the solution will be a hybrid of the technologies we're progressing with the aim to reduce energy and water use, lower capital and operating costs and improve production rates and resource recovery. The financial impact to Suncor can be seen in the change in R&D spend.</p>
Operations	Impacted	<p>In order to meet Suncor's GHG Goal, Operations personnel have actively sought out energy efficient technologies and best practices to reduce fuel consumption. These improvements may deliver both GHG-intensity improvements and operating cost improvements, both of which are needed for success in the current oil industry.</p> <p>Based on confirmation of new emissions regulations, we have updated our estimates of the financial impact of Canadian climate change regulations to our upstream production. The production weighted average after-tax cash cost per barrel of global upstream production over the period 2019 to 2028 is estimated at an average of \$0.70 per barrel.</p> <p>* Regulatory changes in 2018-19 contributed to the modified cost per barrel. Additional information on the Output Based Allocation for Upgrading under Alberta's Carbon Competitiveness Incentive Regulation (CCIR) was the largest contributor to the year-over-year changes. Carbon emissions policy development remains in flux with a high degree of uncertainty.</p>
Other, please specify	Impacted	<p>Suncor values disclosure as a foundational activity for investor engagement and believes that the full context is required to provide a complete picture of operational performance, strategic planning and risk management. In 2018, Suncor publicly supported the recommendations from the Task Force on Climate-related Financial Disclosures, which provide a useful framework to describe how businesses are managing climate risk and ensuring corporate strategies remain resilient in a low-carbon future.</p>



		<p>Suncor continues to build on its experience in transparent disclosure of sustainability information with our 2019 Climate Risk and Resilience Report, which is now publicly available at sustainability.suncor.com/en/</p> <p>Suncor’s Climate Risk and Resilience Report and Report on Sustainability follow the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and the Sustainability Accounting Standards Board (SASB). This supports transparent disclosure of decision-useful information for investors.</p>
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C2.6

(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.

	Relevance	Description
Revenues	Not impacted	While carbon pricing has increased operating costs, the current regulations have not materially impacted Suncor’s revenues. Materiality of impact on revenue may increase with tightening regulations. The greatest impact on revenue will arise from oil price and oil demand. Most energy forecasts (e.g. International Energy Agency) forecast increasing oil demand and robust oil pricing until after 2030. From an opportunity perspective, renewable energy investments may make economic sense and Suncor is already active in wind and biofuels.
Operating costs	Impacted	Carbon pricing or cap and trade regulations apply in most of the jurisdictions in which Suncor operates assets. These prices have increased operating costs (although at some facilities, carbon credit generation has offset the cost of compliance).
Capital expenditures / capital allocation	Impacted	Financial risks associated with increasing carbon prices are affecting investment decisions within Suncor. The portfolio of growth options is being prioritized to take into account the carbon-intensity of the proposed operation.
Acquisitions and divestments	Not impacted	Increasing demand for oil products, stable to increasing prices of oil, and opportunities to reduce operating costs of some existing operations are currently the greatest drivers regarding the value and rate of return of Suncor’s portfolio of assets. Carbon intensity and associated carbon costs of assets are considered during potential acquisitions and divestitures.
Access to capital	Not impacted	The current initiatives toward divestment of oil & gas commitments have caused certain investors and insurers to either reduce or eliminate their exposure to the sector. Notwithstanding the efforts of those few to divest from oil & gas, some new investors have entered oil and gas positions and some remaining investors have been willing to increase their

		investment in oil and gas, so the net impact on Suncor is negligible at this time.
Assets	Not impacted	Apart from compliance costs associated with carbon pricing regulations (discussed above), value, operations and operating costs at our assets have not been impacted.
Liabilities	Not impacted	The cost of asset abandonment, remediation, and reclamation has not been impacted.
Other		N/A

C3. Business Strategy

C3.1

(C3.1) Are climate-related issues integrated into your business strategy?

Yes

C3.1a

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

Yes, qualitative and quantitative

C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b

(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.

Yes

C3.1c

(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.

The process by which the business strategy has been influenced

- Leadership in sustainable resource development is a Suncor strategic driver and is foundational to annual work planning and goal setting (e.g. 2030 GHG intensity goal).
- Company-wide risk identification, assessment and reporting of significant risks to the board. Carbon is a principal risk.
- A carbon price outlook (to assess all investments/projects) utilizes a carbon price range from \$30/tonne to \$100/tonne on an increasing percentage of emissions to ensure projects are expected to provide a competitive IRR under expected carbon regulations. Stress testing is done as appropriate.
- Our project and asset development model incorporates climate risks/opportunities early in the process before commitment of significant resources.
- Suncor measures, forecasts, reports & analyzes data for all our facility emissions to understand emissions sources and opportunities for reductions.
- Strategic planning uses three long-term alternative future energy scenarios to test the robustness of our business & growth strategy.

Example of influence on business strategy and business decisions influenced by climate change made in the reporting year

- In 2018, Suncor continued to pursue its goal to reduce the carbon intensity of crudes and petroleum products by 30% by 2030. In support of this goal, additional resources (personnel & funding) were dedicated to low-carbon extraction technologies and other technological development including biofuels and technology associated with low carbon-intensity electricity, heat, & hydrogen. Additionally in 2018, Suncor proceeded with further engineering and regulatory application work on the project to replace coke-fired boilers with cogeneration units or natural gas boilers at our oil sands Base plant. This project is designed to reduce GHG emissions through fuel switching (i.e. burning natural gas instead of coke) & potential exporting electricity to the Alberta grid with a lower carbon intensity than the grid average. This project is not yet sanctioned.

How climate change aspects and the Paris Agreement have influenced business strategy

- Federal and provincial regulations/policies adopted in response to Canada's commitment to the Paris Agreement. The main aspect of climate change policy that influences business strategy is our management systems to meet regulatory requirements which include energy efficiency programs, carbon pricing outlook, a strategic issues management process & an asset development model.

Short term climate change strategy components

- A corporate-wide focus on energy efficiency measures and innovative technology/processes to reduce emissions.
- We leverage our electricity portfolio of renewable and low-carbon cogeneration assets to participate in the growing power sector. Building on our interest in 111 MW of wind generation with two potential wind projects and exploring utility-scale solar photovoltaic opportunities in Alberta. Suncor currently operates highly efficient cogeneration to provide power/steam to its own facilities. In 2018, these cogeneration facilities exported a total of 419 MW to the grid. These activities provide emission compliance credits.
- Suncor has invested in Lanzatech (a US biofuels firm), Benefuel (a biodiesel technology company), & Enerkem Inc. (a Canadian waste conversion and biofuels firm) with the potential to lower the carbon intensity of our fuels.
- Suncor is currently piloting small-scale electric vehicle charging at retail stations to explore & evaluate commercial viability & test consumer adoption.
- We're active in inclusive consultations with ENGOs, First Nations and Governments to develop effective climate change policy. Suncor publicly advocates for a broad-based economy-wide carbon levy as the most effective, practical & cost efficient policy tool.
- Suncor released its 2019 Climate Risk and Resilience Report which provides our perspective of the future of energy, how we assess, govern & manage carbon risk.

Long term climate change strategy components

- Evaluation of fuel switching opportunities at our facilities includes the opportunity to invest in incremental cogeneration capability. Combined heat and power is highly efficient and results in surplus low-carbon power, available for export to the provincial power grid.
- Suncor invested approximately \$635 million in 2018 in technology development and deployment, & digital technologies to optimize current assets & develop next-generation facilities to continue making oil sands crude more cost and carbon competitive.
- Our technology strategy includes investment in commercializing emission reduction technologies using venture capital through a joint venture called EVOK.
- Suncor co-sponsors the COSIA Carbon X Prize to crowd source commercial uses for carbon.
- Strategically advancing biodiesel supply sources and technology for wider use in cold climates. We have longer-term optionality to optimize our integrated asset infrastructure through investing to switch or supplement existing refining capacity to process biofuels and drop in biological crude components.
- Suncor has an interest in every major oil development offshore of Canada's east coast (operator of Terra Nova; interests in Hibernia, White Rose and Hebron). We are a non-operating partner in the Buzzard & Golden Eagle Area Development (offshore of the U.K.), newly acquired Oda & Fenja projects (offshore of Norway), & with a participating interest in the Rosebank pre-development opportunity. Offshore crude oil is among the lowest carbon intensity sources of crude.

How this is gaining you strategic advantage over competitors



- Long-term alternative energy scenarios provide insight into how our assets may perform in a carbon-constrained context. In the context of either a low crude oil price or highly volatile crude oil price, a long term reserves base, such as the oil sands, sharply reduces exploration costs & risk. The unique characteristics of the resource provides resiliency to continue to deliver value to shareholders in a carbon-constrained future.
- Our scenarios also indicate that being both cost and carbon competitive will be essential in any future energy context. Significant investment in innovation and technology that has the potential to substantially reduce both emissions and cost. Many of our technological innovations, collaborative initiatives, & crowd-sourcing/venture capital investment have the potential for application in other industrial uses.
- Our investment in growing power markets helps us to understand the operational, commercial & policy frameworks necessary for success. Suncor is well-positioned to take advantage of market opportunities.

Forward-looking scenario analysis

- Suncor has uses three long-term alternative future energy scenarios. Each is equally plausible and reflects the aspiration for a low carbon energy system, but each differs as to pace and scale. Signposts for the scenarios are monitored. This process forms the basis of the annual strategic review.

C3.1d

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

Climate-related scenarios	Details
Other, please specify IHS Markit	<p>In our base case energy outlook, we take the following broad trends into consideration: Forecasted population growth, the increasing need for energy in developing economies and the aspiration for a better quality of life. As such, we see the global demand for energy increasing steadily. Much of this increase is expected to come from developing countries in Asia, the Middle East, Latin America and Africa.</p> <p>We believe decoupling of economic growth and carbon emissions is required to fundamentally change the energy mix. National emissions reduction commitments made as part of the Paris Agreement will drive carbon pricing and complementary policy frameworks that are expected to accelerate energy efficiency and emissions reduction technology and incent broader scale adoption of alternative low-carbon energy.</p>

We expect oil demand will continue to grow until approximately 2040 due to population growth, urbanization and increased living standards, but oil is expected to decline as a percentage of the global energy consumption mix. Given natural declines, staying at current production levels, much less meeting increased demand, will require investment in new production from global shale, deep-water and oil sands reserves, a major challenge, given the reduction in capital investment due to depressed commodity prices in recent years.

We expect supply cost will continue to be moderated by industry efforts to optimize production & invest in technological advances. We use 3 long-term energy futures scenarios to test our business strategy. All of the scenarios are plausible & could affect our operating environment & business strategy in markedly different ways. Under each of these scenarios, including the one with the most aggressive decline in oil demand, we believe a substantial amount of oil will be required for decades as the world gets on track to meet its climate ambitions. This view is also supported by forecasts from organizations such as the International Energy Agency & the US Energy Information Administration. Meeting that demand at either low, or highly volatile, oil prices will be a challenge.

Each scenario has an implied crude oil price range & climate change regulatory impact. Two of the three reflect the current global aspiration toward reducing carbon emissions; what differentiates the scenarios is the context, pace & scale at which that comes about. Of these scenarios, “Autonomy” is the scenario we consider best represents the technology and policy context that would be essential to meet the aspiration of limiting cumulative emissions to 450 ppm. In 2019, Suncor is working on the development a 2°C scenario that we can use to test our business strategy beyond 2040.

The scenarios are used annually by the CEO, the Executive Leadership Team and the Board to assess business & growth strategy and identify alternative strategic directions. This process continues to be a useful tool for stress-testing our business on a number of key dimensions, including carbon risk.

Along with scenarios, we also develop & annually update our signposts which are milestones to identify critical shifts in the external context. The world is in a constant state of change, sometimes moving faster than we expect. Tracking the pace & direction of the change is an integral part of our scenario work & helps us develop & evaluate strategic alternatives for our business by incorporating both global and Canadian current events, trends & actions.

Signposts include changes in global energy demand and supply mix, political and economic indicators, climate data, policy and consumer trends, & technology advances.

For more information please see sustainability.suncor.com

C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e

(C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e) Disclose details of your organization's low-carbon transition plan.

Suncor' Climate Risk and Resilience Report, discloses Suncor's best assessment of the business risks associated with climate change and the transition to a low-carbon economy – as well as strategies Suncor is taking to mitigate those risks. This report is publicly available on Suncor's website (sustainability.suncor.com/en/).

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

Scope

Scope 1+2 (location-based)

% emissions in Scope

99

Targeted % reduction from base year

30

Metric

Metric tons CO₂e per unit of production

Base year

2014

Start year

2015

Normalized base year emissions covered by target (metric tons CO₂e)

0.433

Target year

2030

Is this a science-based target?

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

% of target achieved

10

Target status

Underway

Please explain

Our goal is a 30% reduction in GHG emissions intensity by 2030 (scope 1 and 2 emissions only). If current production remained flat, we would expect a similar reduction in absolute emissions. However, planned production growth during this timeframe would add incremental absolute

emissions, albeit at a lower GHG emissions intensity. With the continuous improvement of emission calculation methodology, the data quality has been continuously improved (e.g. previously missing sources are added in the inventory).

% change anticipated in absolute Scope 1+2 emissions

% change anticipated in absolute Scope 3 emissions

0

C4.2

(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.

C-OG4.2a

(C-OG4.2a) If you do not have a methane-specific emissions reduction target for your oil and gas activities or do not incorporate methane into your target(s) reported in C4.2 please explain why not and forecast how your methane emissions will change over the next five years.

In addition to participating in a voluntary methane emission reduction program, Suncor has incorporated methane emissions into the company-wide goal to reduce total GHG emission intensity of the production of oil and petroleum products by 30% by 2030. As a result of having our methane-specific emissions already incorporated in the company wide GHG intensity reduction goal, the need to have an additional methane goal is redundant. Progress on our GHG intensity goal by 2030 requires emissions reductions, including methane, across our facilities. Efforts and technologies specific to managing methane emissions are pursued through a dedicated group within Suncor, in support of the 2030 GHG goal. This group is looking at technologies to better understand area fugitive emissions of methane (i.e. from tailings ponds and mine faces) and identify opportunities to reduce these sources of methane.

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	13	
To be implemented*	19	1,121,016
Implementation commenced*	11	377,994
Implemented*	9	50,800
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 type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

1,728

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

130,420

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

500,000

Payback period

4 - 10 years

Estimated lifetime of the initiative

6-10 years

Comment

Sarnia refinery: DHT Exchanger Cleaning

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

432

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

12,948

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

3,000,000

Payback period

16-20 years

Estimated lifetime of the initiative

3-5 years

Comment

Sarnia refinery: DHT Catalyst Replacement

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

470

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

35,445

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

500,000

Payback period

11-15 years

Estimated lifetime of the initiative

6-10 years

Comment

Sarnia refinery: Acid Gas Flare Purge Reduction

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

470

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

34,565

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

500,000

Payback period

11-15 years

Estimated lifetime of the initiative

6-10 years

Comment

Sarnia refinery: Plant 3 Condensate Drum Quench Nozzle repairs

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

4,575

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

345,214

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

0

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Montreal refinery: Reflux optimization at gasoline hydrotreater E501 and E503 (decrease internal bypass)

Initiative type

Energy efficiency: Processes

Description of initiative

Estimated annual CO₂e savings (metric tonnes CO₂e)

6,100

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

460,285

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

627,000

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Montreal refinery: U1204 (combined steam and CO boiler) economizer repairs

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

13,725

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

1,035,642

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

30,000

Payback period

<1 year

Estimated lifetime of the initiative

11-15 years

Comment

Montreal refinery: valve PV - 4313 repair to minimize unnecessary flaring

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

784

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

59,146

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

71,400

Payback period

1-3 years

Estimated lifetime of the initiative

3-5 years

Comment

Oil sands Base plant: 4E-14A/B/C using inline chemical cleaning

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO₂e savings (metric tonnes CO₂e)

14,850

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

1,120,500

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

2,000,000

Payback period

1-3 years

Estimated lifetime of the initiative

11-15 years

Comment

Oil sands Base plant: E&U fuel gas blending controller

Initiative type

Energy efficiency: Processes

Description of initiative

Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

7,678

Scope

Scope 1

Voluntary/Mandatory

Voluntary

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

579,307

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

500,000

Payback period

1-3 years

Estimated lifetime of the initiative

6-10 years

Comment

Oil sands base plant: Plant 87 hot process water Optimization

C4.3c

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

Method	Comment
Dedicated budget for low-carbon product R&D	<p>Our pursuit of new oil sands extraction technology and process innovation is one method that is used to manage the potential cost of complying with emerging carbon regulations and policy frameworks. The development of low carbon technologies is also a key aspect of Suncor’s efforts to meet its GHG goal.</p> <p>In 2018, Suncor spent approximately \$635 million on technology development and deployment and digital technologies targeting the reduction of capital expenditures, lowering operating costs and environmental performance improvements. The unique nature of our processes could afford us the opportunity to fundamentally reduce our emissions intensity and enhance the way we responsibly develop Canada’s oil sands resources. For example, we are piloting innovative technologies for bitumen resource recovery that use electromagnetic heating in combination with solvent dilution, potentially reducing the need for water and significantly reducing the energy (GHG) required from steam generation. Another technology under development that uses no water instead uses vaporized hydrocarbon solvents to heat a bitumen reservoir. The solvent dilutes and mobilizes bitumen for efficient and effective extraction.</p>
Employee engagement	<p>Suncor employees take individual accountability for reducing waste and improving energy efficiency as part of our employee engagement initiative and Green Ambassador Program. This initiative extends from lunchtime sessions on energy conservation to recognizing employees for energy efficiency and special recognition for GHG emission reduction projects through our President’s Operational Excellence Awards. Additionally, initiatives are underway to engage with business units and employees in regard to methods of meeting our GHG goal, including presentations at internal conferences and articles in internal communication channels (e.g. website, email updates).</p>
Internal price on carbon	<p>An internal carbon price is applied in the annual business planning process for each of our facilities to understand the impact that the expected carbon regulations will have on our operating costs. The internal cost of carbon is also applied to all of our potential growth projects and strategies to assess the viability of the projects over the long term, under both our</p>

	base and stress cases.
Internal incentives/recognition programs	We incentivize GHG performance by progressing projects that get us closer to our GHG goal (e.g. fuel switching, in situ pilots, renewables) and these are reflected in the business unit “growth” component of the executive AIP.
Marginal abatement cost curve	Suncor applies internal and external marginal abatement cost curves to prioritize mitigation projects and rank specific opportunities. The carbon price outlook is used to evaluate abatement economics.
Partnering with governments on technology development	Suncor collaborates with the following government based organizations: Emissions Reduction Alberta supports projects that help Alberta to reduce greenhouse gas emissions and adapt to climate change. Alberta Innovates - to help drive research and accelerate technologies that improve overall environmental performance. Sustainable Technology Development Canada (SDTC) – focuses on clean technologies that improve business performance while using resources more responsibly.
Other	Partnering with Academia - Suncor provides in-kind and/or funding support toward academic research in the areas of energy systems, energy & climate change policies, carbon lifecycle modelling and analysis, technology development and carbon sequestration initiatives.
Other	Energy Management Systems (EMS) - Energy is one of Suncor’s largest inputs creating a natural incentive for us to continue to reduce our overall energy use and the related emissions. The EMS includes both installed energy monitoring equipment as well as a process followed at each of our key operating facilities that provides real time energy information to operators, allowing them to correct and optimize energy inputs on a continuous basis.
Other	Operational Reliability and Continuous Improvement driven by Suncor’s focus on operational excellence is another method used by our company to increase our efficiency and thereby reducing Suncor’s emissions. Suncor’s operational excellence extends through our integrated business, applying consistent stringent standards and practices to improve overall performance. GHG benefits include reduced downtime and startup.

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

Cogeneration Power

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

Environment Canada NIR & GWP, IPCC 4

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

0.2

Comment

With the cogeneration operations in Upstream facilities, Suncor is amongst the largest power producers in Alberta. Suncor facilities use cogeneration to produce combined steam and power, providing considerable energy efficiency gains. These facilities also export a surplus of power to the Alberta provincial power grid, reducing end user power customers by displacing coal power generation and less efficient natural gas generation with cleaner generation. 0.2% is the % revenue value associated with cogeneration as a portion of total revenue in 2018.

Electricity Grid Factors – Environment Canada National Inventory Report , 1990-2011, Part 3, Annex 13 Electricity in Canada: Summary and Intensity Tables

Global Warming Potentials – Environment Canada Global Warming Potentials <http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=CAD07259-1>

For the 2018 reporting year we have used the updated GWP's released in the IPCC fourth assessment report (2007).

Level of aggregation

Product

Description of product/Group of products

Wind/Renewable Power

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

Environment Canada NIR & GWP, IPCC 4

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

0.1

Comment

Suncor produces renewable wind energy. The use of this power enables end users to avoid scope 2 emissions that would have otherwise been consumed through reliance on fossil-fuel power generation. The wind projects in Alberta, Saskatchewan and Ontario reduce the regional grid intensity factor. 0.1% is calculated based on revenue from renewable power sales as a portion of total revenue in 2018.

Electricity Grid Factors – Environment Canada National Inventory Report , 1990-2016, Part 3, Annex 13 Electricity in Canada: Summary and Intensity Tables

Global Warming Potentials – Environment Canada Global Warming Potentials <http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=CAD07259-1>

For the 2018 reporting year we have used the updated GWP's released in the IPCC fourth assessment report (2007).

Assumptions – Capacity factors for each contributing wind farm are assumed calculated to be 35% (average of all wind farms).

Level of aggregation

Product

Description of product/Group of products

Biofuels

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

Environment Canada NIR & GWP, IPCC 4

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

0.8

Comment

Suncor's Ethanol Plant (St. Clair, Ontario) produces biofuel that is blended into gasoline to reduce the carbon intensity of the fuel purchased by our customers in our downstream operations. Suncor avoids close to 0.6 million tonnes of CO₂e per year through the development, deployment and operation of renewable energy facilities. These avoided emissions are not currently deducted from our reported corporate wide GHG totals. 0.8% is calculated based on revenue from ethanol sales as a portion of total revenue in 2018.

Electricity Grid Factors – Environment Canada National Inventory Report , 1990-2016, Part 3, Annex 13 Electricity in Canada: Summary and Intensity Tables

Global Warming Potentials – Environment Canada Global Warming Potentials <http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=CAD07259-1>

For the 2018 reporting year we have used the updated GWP's released in the IPCC fourth assessment report (2007).

C-OG4.6

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

Suncor's methane reduction efforts begin with all registered facilities being surveyed annually for leaks. All detected leaks to atmosphere are immediately fixed as a safety hazard. We also do not vent gas streams such as associated gas, tank blankets, compressor vents or compressor starters; we conserve when we can (if a low pressure system exists that we can tie into) and flare the gas as a minimum. Some small remote sites without electrical power use natural gas to run pneumatics, but these are gradually being replaced by small instrument air or solar powered control packages. An additional source of methane emissions is from tailings ponds and exposed mine surfaces at Suncor's oil sands facilities. New monitoring technology is being developed to help the industry better understand the locations and timing of methane emissions from these sources. Monitoring technology development includes open path sensors that can measure methane concentrations along a line over the source areas, methane concentration sensors mounted on drones or fixed wing airplanes that can measure the concentrations of methane along screens or boxed downwind of facilities, and satellite-mounted sensors that measure methane in the air column above facilities. These detection technologies will help Suncor to better understand where and when methane emissions come from areal sources, helping allow for improved reduction efforts. Methane reduction efforts being examined in regards to emissions from tailings ponds include looking into froth treatment technologies and tailings handling techniques that may reduce the precursors to methane building up in tailings ponds.

COG4.7

(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.

In compliance with provincial, state and federal regulations where Suncor operates, our facilities meet the requirements of regulatory approvals and operate in compliance with the Canadian Council of Ministers of Environment (CCME) Environmental Code of Practice for the Measurement and Control of Fugitive VOC Emissions From Equipment Leaks (Oct 1993). In addition to complying with existing regulatory requirements, Suncor works with COSIA to develop new methods of detecting fugitive methane emissions. These research efforts are followed by regulators in an effort to continuously improve methane emissions technologies, standards, and regulations. One recent example of an innovative methane emissions detection technology is a satellite-based methane detection sensor that can quantify methane concentrations directly above industrial facilities at a spatial resolution of approximately 50 m.

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.

Intermittent flaring during process fluctuations is part of Suncor's oil production activities. Suncor does not have a separate goal for reducing flaring in operations. However, as flaring is included in scope 1 emissions, Flaring Reduction Programs are currently covered within the scope of Suncor's GHG intensity reduction goal. This reduction goal aims to reduce total GHG emission intensity of the production of oil and petroleum products by 30% by 2030, and as a result of this goal, GHG intensive processes, such as flaring, are encouraged to be reduced through energy efficiency goals applied to the business unit level. These energy efficiency goals will help contribute to Suncor's company-wide GHG goal, and ultimately help lower the intensity of Suncor's production by 2030.

In Flaring Reduction Programs, Suncor is making efforts to manage and minimize the flaring. For example, at Suncor's Terra Nova offshore petroleum facility, flare management practices are implemented that are consistent with the World Bank Global Flaring Initiative. In Suncor upstream oil sands facility, great efforts have been put in fuel gas optimization which includes developing better fuel gas blending controller and utilization. The implementation of those projects has allowed a better fuel gas distribution within the plant and therefore minimizes fuel gas and hydrogen flaring.

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, 2010

Base year end

December 31, 2010

Base year emissions (metric tons CO₂e)

17,073,028

Comment

Direct emissions - definition and category aligned with Environmental Canada GHGRP guidance

Scope 2 (location-based)

Base year start

January 1, 2010

Base year end

December 31, 2010

Base year emissions (metric tons CO₂e)

1,841,748

Comment

Purchased low-carbon electricity and steam use grid electricity emission factor and general steam emission factor

Scope 2 (market-based)

Base year start

January 1, 2010

Base year end

December 31, 2010

Base year emissions (metric tons CO₂e)

1,313,469

Comment

Purchased low-carbon electricity and steam use supplier-specific emission factors

C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

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

IPCC Guidelines for National Greenhouse Gas Inventories, 2006

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

US EPA Climate Leaders: Indirect Emissions from Purchases/ Sales of Electricity and Steam

US EPA Climate Leaders: Direct Emissions from Stationary Combustion

US EPA Climate Leaders: Direct Emissions from Mobile Combustion Sources

US EPA Mandatory Greenhouse Gas Reporting Rule

Other, please specify

• IPCC 4, Envir. Can Greenhouse Gas Inventory 1990, etc. For more information please visit sustainability.suncor.com

• IPCC Fourth Assessment Report 2007

• World Business Council for Sustainable Development/World Resource Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting

Standard 2004

- Environment Canada Greenhouse Gas Inventory 1990 – 2007 Report 2009
- Canadian Industrial End-Use Data and Analysis Centre 2009
- Western Climate Initiative Design for the WCI Regional Program July 2010
- National Renewable Energy Laboratory Life Cycle Assessment of Hydrogen Production via Natural Gas Steam Reforming
- Technical Guidance for Completing Specified Gas Compliance Reports (Version 7)
- O. Reg 452/09: Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions July 2017
- Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere 2017
- Environment Canada Facility Greenhouse Gas Reporting Program

C5.2a

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions.

Scope 1 Emission quantification:

- For Quebec facilities: Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere 2018
- For British Columbia facilities: Western Climate Initiative (WCI) Design for the WCI Regional Program
- For Ontario facilities: O. Reg. 452/09: Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions 2018; 2018 (before Cap& Trade was cancelled), and Environment Canada Facility Greenhouse Gas Reporting Program: Canada's Greenhouse Gas Quantification Requirements 2018 (after Cap&Trade was cancelled)
- For Alberta facilities: Alberta Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation (Version 1.1)
- For all other Canadian operations facilities: Environment Canada Facility Greenhouse Gas Reporting Program; Canada's Greenhouse Gas Quantification Requirements 2018
- For US operations facilities: US EPA Mandatory Greenhouse Gas Reporting Rule

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)

20,576,955

Start date

January 1, 2018

End date

December 31, 2018

Comment

Direct (Scope 1) are emissions from sources that are owned and controlled by Suncor. In 2018, Suncor's gross global Scope 1 emissions are calculated as per Environment Canada Facility Greenhouse Gas Reporting Program guidance, including reporting boundary, emission category, calculation methodology and global warming potential.

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 are reporting a Scope 2, market-based figure

Comment

Indirect (Scope 2) includes emissions from energy purchased or acquired and consumed by the reporting company. It includes the emission from purchased electricity, steam, heat and cooling. Scope 2 emission are considered an indirect emissions source (along with Scope 3), because the emissions are a consequence of activities of the reporting organization but actually occur at sources owned or controlled by another organization (i.e. an electricity generator or utility). In 2018, Suncor location-based Scope 2 emissions are calculated based on generic emission factors (i.e. grid electricity emission factor, natural gas boiler steam generation emission factor, and chilled water emission factor). Suncor market-based Scope 2 emissions are calculated by using supplier-specific emission factors for purchased commodity, or determined by developing facility-specific methodology.

C6.3

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

Reporting year

Scope 2, location-based

1,553,252

Scope 2, market-based (if applicable)

1,412,983

Start date

January 1, 2018

End date

December 31, 2018

Comment



Indirect (Scope 2) includes emissions from energy purchased or acquired and consumed by the reporting company. It includes the emissions from purchase electricity, steam, heat and cooling.

For Suncor facilities, the difference between location-based and market-based emissions are from electricity and steam purchased from cogeneration plants (MacKay River In-situ and Sarnia Refinery), and steam purchased from Hydrogen plant (Edmonton Refinery), and cooling water purchased from waste water treatment plant (Edmonton Refinery).

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?

No

C6.5

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

Purchased goods and services

Evaluation status

Relevant, calculated

Metric tonnes CO2e

1,258,024

Emissions calculation methodology

Invoiced purchased hydrogen volumes from supplier multiplied by life-cycle emissions intensity (tonnes CO2e/tonne H2 imported)

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

100

Explanation

Purchased hydrogen (using supplier-specific method).

Capital goods

Evaluation status

Not evaluated

Explanation

Extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year. Scope 3 emissions in this category are not evaluated at this point in time.

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

Evaluation status

Not evaluated

Explanation

All fuel and energy activities are covered in Scope 1 and Scope 2. Extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in scope 1 or scope 2. Scope 3 emissions in this category are not evaluated at this point in time.

Upstream transportation and distribution

Evaluation status

Not evaluated

Explanation

Transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company). Scope 3 emissions in this category are not evaluated at this point in time.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Explanation

Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company). Scope 3 emissions in this category are not evaluated at this point in time.

Business travel

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

33,258

Emissions calculation methodology

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

100

Explanation

Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company). Included in this scope 3 category:

- Commercial air travel
- Fleet vehicles

Employee commuting

Evaluation status

Relevant, calculated



Metric tonnes CO₂e

47,736

Emissions calculation methodology

Bus diesel fuel consumption, Canadian fleet vehicle gasoline and diesel fuel consumption multiplied by standard fuel emission factors.

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

100

Explanation

Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company). Included in this scope 3 category:

- Ground transportation
- Charter air travel

Upstream leased assets

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

14,774

Emissions calculation methodology

Primary office buildings and lodges metered electrical use multiplied by provincial electricity grid factors.

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

100

Explanation

Operation of assets leased by the reporting company (lessee) in the reporting year and not included in scope 1 and scope 2 reported by lessee.

Included in this scope 3 category:

- Lodges
- Facilities

Downstream transportation and distribution

Evaluation status

Not relevant, explanation provided

Explanation

Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumers (if not paid for by the reporting company) including retail and storage (in vehicles and facilities not owned or controlled by the reporting company). These scope 3 emissions are not in scope at this time.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Explanation

Processing of intermediate products sold in the reporting year by downstream companies (e.g. manufacturers). These scope 3 emissions are not in scope at this time.

Use of sold products

Evaluation status

Relevant, calculated

Metric tonnes CO₂e

189,047

Emissions calculation methodology

CO2 directly metered and sold from our facilities to third parties

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

100

Explanation

This includes CO2 from Suncor's refinery hydrogen production and St. Clair ethanol plant's biofermentation process, which are sold to a third party company.

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Explanation

Waste disposal and treatment of products sold by the reporting year, not included in scope 1 and scope 2- reported by lessor. These scope 3 emissions are not in scope at this time.

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Explanation

Operations of assets owned by company (lessor) and leased to other entities in the reporting year, not included in scope 1 and scope 2- reported by lessor. These scope 3 emissions are not in scope at this time.

Franchises

Evaluation status

Not relevant, explanation provided

Explanation

Operation of franchised in the reporting year, not included in scope 1 and scope 2 – reported by franchisor. These scope 3 emissions are not in scope at this time.

Investments

Evaluation status

Not relevant, explanation provided

Explanation

Operation of investments (including equity and debt investments and project finance) in the reporting year, not included in scope 1 or scope 2. These scope 3 emissions are not in scope at this time.

Other (upstream)

Evaluation status

Not relevant, explanation provided

Explanation

Other upstream scope 3 emissions are not in scope at this time.

Other (downstream)

Evaluation status

Not relevant, explanation provided

Explanation

Other downstream scope 3 emissions are not in scope at this time.

C6.7

(C6.7) Are carbon dioxide emissions from biologically sequestered 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

0.000558957

Metric numerator (Gross global combined Scope 1 and 2 emissions)

22,130,207

Metric denominator

unit total revenue

Metric denominator: Unit total

39,592,000,000

Scope 2 figure used

Location-based

% change from previous year

8.9

Direction of change

Decreased

Reason for change

In 2018, there was an 8.9% decrease in intensity from 2017 performance due to more revenue generated from a new facility that had lower overall GHG emissions.

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)

Thousand barrels of natural gas liquids

Metric tons CO2e from hydrocarbon category per unit specified

0

% change from previous year

100

Direction of change

Decreased

Reason for change

In Q1 of 2018, Suncor sold the North America Onshore facility, which was the only operating asset for natural gas liquids production.

Comment

Unit of hydrocarbon category (denominator)

Thousand barrels of crude oil / condensate

Metric tons CO2e from hydrocarbon category per unit specified

54.12

% change from previous year

4

Direction of change

Decreased

Reason for change

In 2018, there was lower off-shore emission intensity due to higher crude oil production, which leads to higher energy efficiency.

Comment

Unit of hydrocarbon category (denominator)

Thousand barrels of oil sands (includes bitumen and synthetic crude)

Metric tons CO₂e from hydrocarbon category per unit specified

74.28

% change from previous year

5

Direction of change

Increased

Reason for change

In 2018, Suncor upstream oil sands Base plant Upgrader had the major turnaround (60 days), which led to lower bitumen production and therefore lower energy efficiency in extraction plants.

Comment

The denominator is Suncor upstream SCO production.

Unit of hydrocarbon category (denominator)

Thousand barrels of oil sands (includes bitumen and synthetic crude)

Metric tons CO2e from hydrocarbon category per unit specified

58.36

% change from previous year

10

Direction of change

Decreased

Reason for change

In 2018, Suncor upstream in situ facilities had significant higher production because the sites went through major maintenance events in 2017. Suncor's upstream oil sands Fort Hills started up in January of 2018 and production ramped up to full capacity by the end of 2018. Great efforts have been put over this time period to increase energy efficiency and therefore decrease the Scope 1 emissions.

Comment

The denominator is Suncor upstream in situ and Fort Hills bitumen production.

Unit of hydrocarbon category (denominator)

Thousand barrels of refinery net production

Metric tons CO2e from hydrocarbon category per unit specified

23.73

% change from previous year

1

Direction of change

Decreased

Reason for change

In 2018, Suncor refineries had increased utilization and several projects were also implemented to improve energy efficiency, therefore decreased Scope 1 emissions.

Comment

The denominator is Suncor upstream product to market.

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

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

0.03

Comment

The unit is tonnes CH₄ / m³ total upstream hydrocarbon production. The methane emissions are the total combined gross Scope 1 methane emissions from Suncor upstream facilities (including vents, leaks, etc.).

Oil and gas business division

Downstream

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

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

0.003

Comment

The unit is tonnes CH₄ / m³ total upstream hydrocarbon production. The methane emissions are the total combined gross Scope 1 methane emissions from Suncor downstream facilities (including vents, leaks, etc.).

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 CO ₂ e)	GWP Reference
CO ₂	20,096,825	IPCC Fourth Assessment Report (AR4 - 100 year)
CH ₄	370,215	IPCC Fourth Assessment Report (AR4 - 100 year)
N ₂ O	108,122	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	340	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	88	IPCC Fourth Assessment Report (AR4 - 100 year)
SF ₆	1,365	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

Fugitives

Value chain

Upstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

79,318.66

Gross Scope 1 methane emissions (metric tons CH4)

12,195.72

Total gross Scope 1 emissions (metric tons CO2e)

384,211.6

Comment

Upstream facilities include bitumen and crude oil producers

Emissions category

Fugitives

Value chain

Downstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

0

Gross Scope 1 methane emissions (metric tons CH4)

92.83

Total gross Scope 1 emissions (metric tons CO2e)

2,320.73

Comment

Downstream facilities include refineries and renewable fuel producers.

Emissions category

Venting

Value chain

Upstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

123.11

Gross Scope 1 methane emissions (metric tons CH4)

272.56

Total gross Scope 1 emissions (metric tons CO2e)

6,937.02

Comment

Emissions category

Venting

Value chain

Downstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

27.49

Gross Scope 1 methane emissions (metric tons CH4)

97.05

Total gross Scope 1 emissions (metric tons CO2e)

2,453.73

Comment



Emissions category

Flaring

Value chain

Upstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

337,711.16

Gross Scope 1 methane emissions (metric tons CH4)

978.12

Total gross Scope 1 emissions (metric tons CO2e)

362,533.58

Comment

Emissions category

Flaring

Value chain

Downstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

182,285.95

Gross Scope 1 methane emissions (metric tons CH4)

231.3

Total gross Scope 1 emissions (metric tons CO2e)

188,613.4

Comment

Emissions category

Combustion (excluding flaring)

Value chain

Upstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

13,423,470.71

Gross Scope 1 methane emissions (metric tons CH4)

465.64

Total gross Scope 1 emissions (metric tons CO2e)

13,510,901.4

Comment

Emissions category

Combustion (excluding flaring)

Value chain

Downstream

Product

Oil

Gross Scope 1 CO2 emissions (metric tons CO2)

4,183,254

Gross Scope 1 methane emissions (metric tons CH4)

836

Total gross Scope 1 emissions (metric tons CO2e)

4,218,284

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	19,649,232
United States of America	927,723

C7.3

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

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO ₂ e)	Latitude	Longitude
Oil Sands Base Plant	7,868,187	57.0033	-111.4661
In Situ Firebag	5,329,586	57.2297	-110.8325
In Situ MacKay River	398,673	57.03347	-111.88712
Terra Nova FPSO	615,317	46.2831	-48.2851
Edmonton Refinery	1,131,608	53.55558	-113.33275
Montreal Refinery	1,186,809	45.50806	-73.57111
Sarnia Refinery	772,406	42.9306	-82.4433
Commerce City Refinery	927,723	39.80168	-104.94698
Montreal Sulphur Plant	21,836	45.639381	-73.515457
Burrard Terminal	10,650	49.283	-122.85
Pipelines	9,443	57.1165	-111.1493
Renewables - St. Clair Ethanol Plant	157,797	42.9294	-82.4381
Renewables - Wind	13	49.71306	-112.78745
Fort Hills	2,146,909	57.39207	-111.56791

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	Comment
Oil and gas production activities (upstream)	16,358,671	Upstream activities
Oil and gas production activities (downstream)	4,128,284	Downstream activities

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 in market-based approach (MWh)
Canada	1,355,991	1,215,705	5,556,104	3,601,402
United States of America	197,260	197,278	294,300	0

C7.6

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

By facility

C7.6b

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

Facility	Scope 2 location-based emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
----------	---	--

Oil Sands Base Plant	0	0
In Situ Firebag	0	0
In Situ MacKay River	720,000	554,010
Terra Nova FPSO	0	0
Fort Hills	0	0
Edmonton Refinery	448,066	410,771
Montreal Refinery	507	507
Sarnia Refinery	146,869	209,868
Commerce City Refinery	197,260	197,278
Montreal Sulphur Plant	11	11
Burrard Terminal	111	111
Pipelines	37,750	37,750
Renewables - St Clair Ethanol Plant	2,662	2,662
Renewables - Wind	15	15

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
Oil and gas	720,000	554,010	In 2018, Suncor location-based Scope 2 emissions are calculated based on generic



production activities (upstream)			emission factors (i.e. grid electricity emission factor, natural gas boiler steam generation emission factor, and chilled water emission factor). Suncor market-based Scope 2 emissions are calculated by using supplier-specific emission factors for purchased commodity, or determined by developing facility-specific methodology.
Oil and gas production activities (downstream)	833,252	858,973	In 2018, Suncor location-based Scope 2 emissions are calculated based on generic emission factors (i.e. grid electricity emission factor, natural gas boiler steam generation emission factor, and chilled water emission factor). Suncor market-based Scope 2 emissions are calculated by using supplier-specific emission factors for purchased commodity, or determined by developing facility-specific methodology.

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?

Increased

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	4,489	Increased	0.24	In 2018, emissions from two sources were quantified and compared to 2017: 1. Biodiesel is consumed in oil sand base plant as fuel for various combustion equipment and heavy hauler/trucks for Mining site. 2. Biogas which is generated from fermentation is consumed in Ethanol

				Plant in equipment and biomethanator flare.
Other emissions reduction activities	50,800	Decreased	2.67	A few projects were conducted in 2018 to improve energy efficiency and therefore decrease the Scope 1 emissions. These projects include a range of process optimization initiatives to improve heat transfer and reliability.
Divestment	19,948	Decreased	1.05	Suncor previously operated North America Onshore in British Columbia, which was sold in Q1 of 2018. 2018 performance data reflects this sale.
Acquisitions				N/A
Mergers				N/A
Change in output				N/A
Change in methodology				N/A
Change in boundary	2,146,909	Increased	112.8	Oil sands Fort Hills started operations in January 2018 and production ramped up to full capacity by the end of 2018. 2018 performance data reflects the new facility.
Change in physical operating conditions				N/A
Unidentified				N/A
Other	177,282	Decreased	9.31	In 2018, fuel consumption and other operational related activities (i.e. flaring and venting) decreased. The decrease could also be attributed to the upstream production increase in 2018, compared to 2017.

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 10% but less than or equal to 15%

C8.2

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

	Indicate whether your organization undertakes this energy-related activity
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	Yes
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 MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	321,429	90,877,972	91,199,401
Consumption of purchased or acquired electricity		0	1,849,301	1,849,301

Consumption of purchased or acquired steam		0	3,989,442	3,989,442
Consumption of purchased or acquired cooling		0	11,661	11,661
Consumption of self-generated non-fuel renewable energy		0		0
Total energy consumption		321,429	96,728,376	97,049,805

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	No
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.

Fuels (excluding feedstocks)

Natural Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

56,788,987

MWh fuel consumed for self-generation of electricity

21,463,209

MWh fuel consumed for self-generation of heat

11,677,281

MWh fuel consumed for self-generation of steam

23,648,496

MWh fuel consumed for self-cogeneration or self-trigeneration

25,942,308

Comment

Individual contributions do not equal the total natural gas (MWh) consumed by the organization. The MWh of natural gas consumed for cogeneration volumes are already reported in the volumes consumed for the generation of electricity and steam.

Fuels (excluding feedstocks)

Fuel Gas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

18,372,209

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

14,769,115

MWh fuel consumed for self-generation of steam

3,603,094

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Diesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

5,963,167

MWh fuel consumed for self-generation of electricity

35,169

MWh fuel consumed for self-generation of heat

5,927,998

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Heavy Gas Oil

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

471,736

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

107,694

MWh fuel consumed for self-generation of steam

364,041

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Propane Liquid

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

43,870

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

42,970

MWh fuel consumed for self-generation of steam

900

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Petroleum Coke

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

6,358,288

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

2,635,913

MWh fuel consumed for self-generation of steam

3,722,375

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Biodiesel

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

315,085

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

315,085

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

Fuels (excluding feedstocks)

Biogas

Heating value

LHV (lower heating value)

Total fuel MWh consumed by the organization

6,343

MWh fuel consumed for self-generation of electricity

0

MWh fuel consumed for self-generation of heat

6,343

MWh fuel consumed for self-generation of steam

0

MWh fuel consumed for self-cogeneration or self-trigeneration

0

Comment

The sum of biogas and biodiesel equals the amount recorded in C8.2a under “renewable energy.”

C8.2d

(C8.2d) List the average emission factors of the fuels reported in C8.2c.

Biodiesel

Emission factor

869.2

Unit

lb CO₂e per barrel

Emission factor source

Alberta Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation 2018 (Version 1.1)

Comment

Default emission factor was applied

Biogas

Emission factor

0.04954

Unit

metric tons CO₂e per GJ

Emission factor source

Guideline for Quantification, Reporting and Verification of Greenhouse Gas Emissions Table 20-2 (Ontario GHG guidance)

Comment

Default emission factor was applied

Diesel

Emission factor

942.4

Unit

lb CO₂e per barrel

Emission factor source

Environment Canada Facility Greenhouse Gas Reporting Program: Canada's Greenhouse Gas Quantification Requirements 2018

Comment

Default emission factor was applied

Fuel Gas

Emission factor

0.00179

Unit

metric tons CO₂e per m³

Emission factor source

Gas composition; Environment Canada Facility Greenhouse Gas Reporting Program: Canada's Greenhouse Gas Quantification Requirements 2018

Comment

Fuel gas compositions are obtained from lab analysis (weighted average of upstream and downstream facilities)

Heavy Gas Oil

Emission factor

1,102.3

Unit

lb CO₂e per barrel

Emission factor source

CIDEEDAC, Development of GHG Intensity indicators from Canadian Industry 1990 to 2009 data, March 2011 Report. Table 2-1; 2009 API Compendium, Table 4.7; National Inventory Report – Greenhouse Gas Sources and Sinks in Canada 1990-2009 Report Part 2. Table A8-4

Comment

Default emission factor was applied

Natural Gas

Emission factor

0.00191

Unit

metric tons CO₂e per m³

Emission factor source

NG composition; Environment Canada Facility Greenhouse Gas Reporting Program: Canada's Greenhouse Gas Quantification Requirements 2018

Comment

NG compositions are provided by NG producers (weighted average of upstream and downstream facilities)

Petroleum Coke

Emission factor

3.109



Unit

metric tons CO2e per metric ton

Emission factor source

Coke composition; Alberta Quantification Methodologies for the Carbon Competitiveness Incentive Regulation and the Specified Gas Reporting Regulation 2018 (Version 1.1)

Comment

Coke compositions are obtained from lab analysis

Propane Liquid

Emission factor

542.5

Unit

lb CO2e per barrel

Emission factor source

Environment Canada Facility Greenhouse Gas Reporting Program: Canada's Greenhouse Gas Quantification Requirements 2018

Comment

Default emission factor was applied

C8.2e

(C8.2e) 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	8,199,044	6,258,524	100,850	0

Heat	28,385,920	28,385,920	5,075	5,075
Steam	22,984,417	22,984,417	0	0
Cooling	0	0	0	0

C8.2f

(C8.2f) Provide details on the electricity, heat, steam and/or cooling amounts that were accounted for at a low-carbon emission factor in the market-based Scope 2 figure reported in C6.3.

Basis for applying a low-carbon emission factor

Contract with suppliers or utilities (e.g. green tariff), not supported by energy attribute certificates

Low-carbon technology type

Other low-carbon technology, please specify
Cogeneration

Region of consumption of low-carbon electricity, heat, steam or cooling

North America

MWh consumed associated with low-carbon electricity, heat, steam or cooling

3,601,402

Emission factor (in units of metric tons CO2e per MWh)

0.2445

Comment

Cogeneration Power Emission factor: 0.2445 metric tons CO2e per MWh

Cogeneration Steam Emission factor: 0.2001 metric tons CO₂e per MWh

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	11.4	Crude oil produced from Terra Nova FPSO.
Natural gas liquids, million barrels	0	In Q1 of 2018, Suncor sold the facility North America Onshore, which was the only operating asset for natural gas liquids production. 2018 production data reflect this sale.
Oil sands, million barrels (includes bitumen and synthetic crude)	203.7	Bitumen and synthetic crude oil produced from Oil Sands facilities.
Natural gas, billion cubic feet	0	No NG produced from Suncor facilities.

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.

Suncor reports reserves in accordance with Canadian Securities Administrators' National Instrument 51-101 "Standards of Disclosure for Oil and Gas Activities" (NI 51-101).

Suncor's reserves were evaluated by independent qualified reserves evaluators, GLJ and Sproule, in accordance with NI 51-101 and the Canadian Oil and Gas Evaluation (COGE) Handbook.

Suncor reports 1P reserves in accordance with the Securities and Exchange Commission (SEC).

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	6,433			Volumes and percentages indicated in the questions below are based on NI 51-101.

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	5.2			Proved + probable reserves: 2P = 5.2% Volumes and percentages indicated in the questions below are based on NI 51-101.
Natural gas	0.1			Proved + probable reserves: 2P = 0.1%

				Volumes and percentages indicated in the questions below are based on NI 51-101.
Oil sands (includes bitumen and synthetic crude)	94.7			Proved + probable reserves: 2P = 94.7% Volumes and percentages indicated in the questions below are based on NI 51-101.

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 (%)

2.1

Net proved reserves (1P) (%)

0

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

0

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

Net total resource base (%)

Comment

Assets onshore

In-year net production: 2.1%

In year net production numbers are as per the NI 51-101 methodology but are gross (before royalty) rather than net (after royalty).

Development type

Shallow-water

In-year net production (%)

13.5

Net proved reserves (1P) (%)

3.7

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

5.1

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

Net total resource base (%)

Comment

Assets in water depth < 150m

In-year net production: 13.5%

Net proved reserves: 1P = 3.7%

Net proved + probable reserves: 2P = 5.1%

In year net production numbers are as per the NI 51-101 methodology but are gross (before royalty) rather than net (after royalty).

Development type

Deepwater

In-year net production (%)

0

Net proved reserves (1P) (%)

0.2

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

0.2

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

Net total resource base (%)

Comment

Assets in water depth 150m – 1,500m

In-year net production: 0%

Net proved reserves: 1P = 0.2%

Net proved + probable reserves: 2P = 0.2%

In year net production numbers are as per the NI 51-101 methodology but are gross (before royalty) rather than net (after royalty).

Development type

Oil sand/extra heavy oil

In-year net production (%)

84.4

Net proved reserves (1P) (%)

96.1

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

94.7

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

Net total resource base (%)

Comment

Oil sand/extra heavy oil: Oil sands extraction by mining and in-situ methods and other assets that produce oil with an API gravity of less than 10°.

In-year net production: 84.4%

Net proved reserves: 1P = 96.1%

Net proved + probable reserves: 2P = 94.7%

In year net production numbers are as per the NI 51-101 methodology but are gross (before royalty) rather than net (after royalty).

C-OG9.3a

(C-OG9.3a) Disclose your total refinery throughput capacity in the reporting year in thousand barrels per year.

Total refinery throughput capacity (Thousand barrels per day)

Capacity	485.96
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C-OG9.3b

(C-OG9.3b) Disclose feedstocks processed in the reporting year in million barrels per year.

	Throughput (Million barrels)	Comment
Oil	157.31	
Other feedstocks	11.91	
Total	169.22	

C-OG9.3c

(C-OG9.3c) Are you able to break down your refinery products and net production?

Yes

C-OG9.3d

(C-OG9.3d) Disclose your refinery products and net production in the reporting year in million barrels per year.

Product produced	Refinery net production (Million barrels) *not including products used/consumed on site
Gasolines	76.49
Diesel fuels	56.95
Fuel oils	24.61
Other, please specify Other Distillates	11.3

C-CO9.6/C-EU9.6/C-OG9.6

(C-CO9.6/C-EU9.6/C-OG9.6) Disclose your investments in low-carbon research and development (R&D), equipment, products, and services.

Investment start date

January 1, 2011

Investment end date

Investment area

R&D

Technology area

Other, please specify
Solvent+ Technology

Investment maturity

Pilot demonstration

Investment figure

Low-carbon investment percentage

Please explain

Suncor is focused on solvents as an alternative to steam in recovering bitumen from in situ reservoirs. Our current focus in solvent recovery processes builds on our experience and background knowledge, gained from participation in experiments going back more than 20 years.

In the solvent-based processes that Suncor is pursuing, a light hydrocarbon solvent such as propane or butane is used as the primary means to mobilize bitumen. The effectiveness of solvent-based recovery processes is significantly enhanced as the temperature of the reservoir is raised.

The increased temperature promotes in situ solvent reflux which maximizes recovery efficiency by limiting the volume of solvent recycled back to surface facilities.

Currently, Suncor is advancing, to the pilot phase, a suite of solvent technologies referred to as Solvent+, where the “+” refers to a range of heating technologies that can be coupled with solvent injection. These include:

- wellbore heating
- superheated solvent injection
- electromagnetic heating

If successful, Solvent+ offers the potential for significant environmental improvements over SAGD including:

- reduction in GHG emissions intensity by 50 to 70%
- elimination of process water
- reduction in the surface footprint
- reduction in transport diluent requirements
- reduction in carbon content of produced oil
- potential to unlock additional resources

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.

45

Approximately \$45/BOE

Refers to average WTI crude prices for 2017 and estimated average WTI crude oil price for 2018 in US dollars required for funds from operations for 2017 and estimated 2018 sustaining capital expenditures inclusive of associated capitalized interest and dividends. Assumes production, sustaining



capital and business environment the midpoint of 2018 guidance released on May 1st, 2018 and a \$0.36/share dividend for each quarter in 2018. All dividends are at the discretion of Suncor’s Board of Directors. Actual results may differ materially.

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 third-party verification or assurance

C10.1a

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

Scope

Scope 1

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 2019-suncor-assurance-statement-en.pdf

Page/ section reference

[Ernst & Young LLP Independent Assurance Statement](#)

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

99

Scope

Scope 2 market-based

Verification or assurance cycle in place

Annual process

Status in the current reporting year

Complete

Type of verification or assurance

Limited assurance

Attach the statement

 2019-suncor-assurance-statement-en.pdf

Page/ section reference

[Ernst & Young LLP Independent Assurance Statement](#)

Relevant standard

ISAE3000

Proportion of reported emissions verified (%)

97

Scope

Scope 1

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

CHEMINFO Verification Report - not publicly available

Relevant standard

Alberta Specified Gas Emitters Regulation (SGER)

Proportion of reported emissions verified (%)

100

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?

Yes

C10.2a

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Other, please specify Greenhouse Gas (GHG) Scope 1 and 2 emissions	EY provided limited assurance in accordance with ISAE3000	
C4. Targets and performance	Other, please specify GHG emissions intensity	EY provided limited assurance in accordance with ISAE3000	

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 tax

Alberta SGER

BC carbon tax

Ontario CaT

Québec CaT

☞ Alberta SGER is now Alberta CCIR

C11.1b

(C11.1b) Complete the following table for each of the emissions trading systems in which you participate.

Alberta SGER

% of Scope 1 emissions covered by the ETS

95.2

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

11,930,979

Allowances purchased

1,395,113

Verified emissions in metric tons CO₂e

13,326,091

Details of ownership

Facilities we own and operate

Comment

Ontario CaT

% of Scope 1 emissions covered by the ETS

100

Period start date

January 1, 2018

Period end date

October 31, 2018

Allowances allocated

1,017,553

Allowances purchased

0

Verified emissions in metric tons CO2e

930,202

Details of ownership

Facilities we own and operate

Comment

Facilities we own and operate

Québec CaT



% of Scope 1 emissions covered by the ETS

100

Period start date

January 1, 2018

Period end date

December 31, 2018

Allowances allocated

1,127,772

Allowances purchased

58,791

Verified emissions in metric tons CO₂e

1,186,563

Details of ownership

Facilities we own and operate

Comment

Facilities we own and operate

C11.1c

(C11.1c) Complete the following table for each of the tax systems in which you participate.

Alberta carbon tax

Period start date

January 1, 2018

Period end date

December 31, 2018

% of emissions covered by tax

84

Total cost of tax paid

216,723,779

Comment

BC carbon tax

Period start date

January 1, 2018

Period end date

December 31, 2018

% of emissions covered by tax

81

Total cost of tax paid

160,449,385

Comment

C11.1d

(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?

Suncor follows a low-cost compliance strategy where cost-effective facility emissions reductions are pursued first, followed by retiring offset credits generated from either our wind facilities or cogeneration facilities, followed by offset purchases and secondary market purchases of allowances. Suncor also has refineries in Ontario and Quebec, both of which were covered by a Cap and Trade system in 2018. Ontario ended its Cap and Trade system in late 2018. Suncor has joint ownership in UK North Sea assets but these assets are operated by another company whose responsibility includes compliance with the European Union Emissions Trading Scheme.

C11.2

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

No

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

Other, please specify

Change Internal Behaviour

GHG Scope

Scope 1

Application

All business units

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

30

Variance of price(s) used

\$30/tonne CO₂e to \$100/tonne CO₂e

Type of internal carbon price

Shadow price

Impact & implication

As part of its ongoing business planning, Suncor assesses future costs associated with CO₂ emissions in its operations and the evaluation of future projects, based on the company's outlook for the carbon price under current and pending GHG regulations, using a price range of \$30 to \$100/tonne of CO₂e as a base case, applied against a range of policy design options.

C12. Engagement

C12.1

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

Yes, our suppliers

Yes, our customers

C12.1a

(C12.1a) Provide details of your climate-related supplier engagement strategy.

Type of engagement

Information collection (understanding supplier behavior)

Details of engagement

Collect climate change and carbon information at least annually from suppliers

Other, please specify

Engagement & incentivization (changing supplier behavior) - Run an engagement campaign to educate suppliers about climate change

% of suppliers by number

26

% total procurement spend (direct and indirect)

49

% Scope 3 emissions as reported in C6.5

Rationale for the coverage of your engagement

Suncor's supplier risk identification process begins with a pre-screen process through our prequalification tool, Avetta. This process ensures current and potential Contractors meet Suncor's minimum requirements in EH&S and regulatory, legal, quality and finance.

In 2019, SCM implemented a series of Sustainability questions that must be answered by all Suppliers when prequalifying with Suncor. The Sustainability questions are focused on Indigenous relations/participation, climate change, human rights, inclusion and diversity, community investment and social innovation and sustainability embedding. As of April 30, 2019, 1,714 suppliers and 1,954 potential suppliers had provided responses to the sustainability prequalification questions through Avetta. The 1,714 active suppliers that responded represent 49% of our 2018 supply chain spend and 26% of our suppliers.

Impact of engagement, including measures of success

In 2018 SCM Sustainability formalized a Supply Chain Management Sustainability Strategy. The strategy was developed based on Suncor's reported materiality assessment for our Report on Sustainability, Suncor's priority issues, our Corporate Goals, expectations of stakeholders and other thought leadership. The process took into account internal and external inputs and material issues.

This assessment identified six priority areas for Suncor Supply Chain Management and provided us with the systematic approach to gathering

information based on risk at every step of our supply chain. These areas of focus are designed to progress our sustainability strategy and are aligned with our Corporate goals including Suncor's Social Goal and our GHG Goal. The six areas are:

1. Indigenous Business Development
2. GHG Emissions
3. Inclusion and Diversity
4. Human Rights & Ethics
5. Community Investment
6. Water Stewardship

Comment

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement

Education/information sharing

Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

% Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement



Commercial customers occasionally inquire about Suncor’s climate change position and actions; questionnaires are completed as required for commercial contracts and bids.

PumpTalk is a blog created by Petro-Canada, a Suncor business, to share information and engage in discussion about a number of topics, such as fuel efficiency and product responsibility. In our weekly posts, we discuss subjects that we believe are important and are of interest to drivers everywhere. Here you’ll find posts on gas prices, reducing fuel costs, sustainability, auto industry innovation, electric vehicle charging stations and vehicle safety and maintenance, as well as posts on climate change as it relates to the energy industry and our shared responsibility. Suncor’s Report on Sustainability and its Climate Report are published to encourage further engagement with Suncor on its climate change position and actions

Impact of engagement, including measures of success

- Building awareness and increasing understanding of climate change
- Enhance engagement with internal and external stakeholders about Suncor’s sustainability performance

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
Cap and trade	Support with	Sitting on several technical working groups	Use Output Based Standards for various product categories, and keep a wide

	minor exceptions	for the proposed federal Output Based Pricing System (OBPS), as well as providing written submissions to requests for feedback.	range of compliance options available (e.g. emissions performance credits, offset credits, and payment into a technology fund).
Carbon tax	Support with minor exceptions	Sitting on a technical working group for the proposed Clean Fuel Standard, as well as providing written submissions to requests for feedback.	Set performance standards for carbon intensity of various fuels (gaseous, liquid, and solid) used in transportation, industrial uses, and buildings; achieve compliance by fuel switching (such as switching from bunker fuel to diesel or natural gas) and using biofuels, then purchasing credits from others who have achieved a carbon intensity better than the standard.
Regulation of methane emissions	Support with minor exceptions	Provided online responses to requests for feedback on provincial regulation for methane emissions reductions.	Set a limit on methane emissions for various types of regulated facilities, including a phase-in period; no opportunity for credits or payments, compliance is mandatory.
Clean energy generation	Support with minor exceptions	Sitting on a technical working group for the proposed Clean Fuel Standard, as well as providing written submissions to requests for feedback.	British Columbia's Renewable and Low Carbon Fuel Requirement Regulation requires fuel suppliers to meet a provincial fuel pool carbon intensity target through blending incremental renewable fuel or investing in alternative fuels infrastructure. Federal and provincial renewable fuel standards mandate blending of ethanol into gasoline, and blending biodiesel into diesel. In addition, the federal government has recently proposed implementing a national Clean Fuels Standard, which remains under development.

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 Alliance of Petroleum Producers

Is your position on climate change consistent with theirs?

Inconsistent

Please explain the trade association's position

CAPP does not consistently and transparently support carbon pricing in all jurisdictions or an emissions limits.

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

Suncor remains an active member of CAPP, working to communicate our position of supporting carbon pricing, with considerations for trade exposed industries, and the Alberta provincial emissions limit on oil sands operations.

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?

Suncor's General Manager, Sustainability has accountability for energy and climate change policy and the processes to ensure that all Suncor engagement is consistent with overall corporate position. This team coordinates all policy related activities, whether direct engagement, or engagement through trade associations. The team has clear principles for climate change policy engagement, and also documents and provides guidance and key messages across organizations. This team supports reaching an aligned policy position among business units. In addition to cross-functional team collaboration, the team also uses the following Suncor tools: stakeholder information management system (SIMS); risk management process, strategic issues management process (SIMP); and internal lobbying policy and guidelines. While Suncor actively influences the policy positions and statements of those associations of which it is a member or participant, those organizations exist as separate entities and may, from time to time, have positions

that are not fully aligned with Suncor's. Our membership does not indicate that they speak on our behalf and, for further clarity; we outline our corporate positions on issues such as climate change on our own Sustainability site on sustainability.suncor.com/en/.

Government Relations is accountable for all relationships with governments, and ensuring communications to government go through the Government Relations department helps ensure consistency of the message.

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

 2018-annual-report-en.pdf

Page/Section reference

[Suncor's 2018 Annual Report](#)

Content elements

Strategy

Risks & opportunities

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

 2018-annual-aif-en.pdf

Page/Section reference

[Suncor's Annual Information Form dated February 28, 2019](#)

Content elements

Strategy

Risks & opportunities

Comment

Publication

In mainstream reports

Status

Complete

Attach the document

 2019-management-proxy-circular-en.pdf

Page/Section reference

[Suncor's 2019 Management Proxy Circular](#)

Content elements

Governance
Strategy

Comment

Publication

In voluntary sustainability report

Status

Complete

Attach the document

 2019-report-on-sustainability-en.pdf

Page/Section reference

[2019 Report on Sustainability](#)

Content elements

Strategy
Risks & opportunities
Emissions figures

Emission targets

Other metrics

Comment

C14. 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.

[Advisories]

Forward-Looking Statements: These responses contain certain forward-looking statements and forward-looking information (collectively, forward-looking statements) based on Suncor's current expectations, estimates, projections and assumptions that were made by Suncor in light of information available at the time these responses were prepared. Some of the forward-looking statements may be identified by words like "expected", "will", "estimates", "could", "anticipates", "intends", "may", "forecasts", "potential", "strategy", "goal", "objective", "outlook", "target" and similar expressions. Forward-looking statements in these responses include references to: Suncor's strategies; expected regulatory changes, the impact thereof, including compliance costs, and resulting opportunities for Suncor; the belief that concerns over climate change and fossil fuel extraction could lead governments to enact additional or more stringent laws and regulations; estimated impacts of risks, opportunities and Suncor's responses thereto as well as the intended impact of mitigation efforts; Suncor's belief's relating to the time horizon, types of impact, the potential financial impact, likelihood, magnitude of impact of the disclosed risks, including escalating climate related regulatory costs and constraints, changing consumer behaviour, extreme weather events and increasing stakeholder expectations; Suncor's estimate of the production weighted average after-tax cost per barrel of global production over the prior 2019 to 2028; Suncor's goal to reduce GHG intensity; expectations for demand for oil and refined petroleum products and for refining capacity, and the assumptions for such expectations and expectations around the sources of such products; the expected type of financial impact, time horizon, likelihood, potential financial impact and magnitude of impact of the disclosed opportunities, including increasing renewable energy demand, increasing biofuels demand, carbon credit offset generation, exchanging low carbon technology with adjacent industries and development of new technology and the emerging demand for electric vehicle charging; statements about Suncor's proposed electric vehicle charging network; initiatives to gain access to new markets for Suncor's crude oil and refined products; the belief that technology and energy innovation has the potential to move emissions reduction from incremental to step change improvement and that the solution to lowering the carbon intensity of producing bitumen will be a

hybrid of the technologies being progressed; plans and expectations, including potential benefits, around technologies and technology development; Suncor's belief regarding the benefits of sustainability reporting; Suncor's growth plans; Suncor's strategy for energy efficiency and advancing carbon reduction technology; Suncor's carbon price outlook (including the anticipated benefits from using the outlook to assess investments and projects) as well as the expecting impact from carbon pricing; Suncor's position with respect to low carbon transportation fuels; potential opportunities with respect to renewable energy; plans, expectations (including as to cost and timing) and results (including CO₂e savings and monetary savings) for projects, initiatives and activities undertaken by Suncor or in which Suncor is involved, including the coke-fired boil replacement program and potential renewables projects (wind, photovoltaic and cogeneration); the expectation that the characteristics of oil sands provide resiliency to continue to deliver value to shareholders; the expected impacts of the Paris Agreement; the expectation that Suncor will develop a 2oC scenario to be used to test its business strategy beyond 2040; the total estimated annual CO₂e savings relating to Suncor's various initiatives as well as the estimated annual monetary savings, CO₂e savings, payback period and estimated lifetime of the initiatives that were implemented in 2018; trends related to Suncor's base case energy outlook; potential incremental cogeneration capacity and fuel switching opportunities; the objective of making oil sands crude both cost and carbon competitive; the expected oil price required to cover Suncor's sustaining capital and dividend; estimated emissions intensities and absolute emissions levels; and reserves estimates.

Forward-looking statements are not guarantees of future performance and involve a number of risks and uncertainties, some that are similar to other oil and gas companies and some that are unique to our company. Suncor's actual results may differ materially from those expressed or implied by our forward-looking statements and you are cautioned not to place undue reliance on them. Suncor's Management's Discussion & Analysis for the first quarter of 2019 and its most recently filed Annual Information Form/Form 40-F, Annual Report to Shareholders and other documents it files from time to time with securities regulatory authorities describe the risks, uncertainties, material assumptions and other factors that could influence actual results and such factors are incorporated herein by reference. Copies of these documents are available without charge from Suncor or by referring to the company's profile on SEDAR at sedar.com or EDGAR at sec.gov. Except as required by applicable securities laws, Suncor disclaims any intention or obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Reserves and BOEs: Certain natural gas volumes have been converted to barrels of oil equivalent (boe) on the basis of one barrel to six thousand cubic feet. Any figure presented in boe may be misleading, particularly if used in isolation. A conversion ratio of one barrel of crude oil or natural gas liquids to six thousand cubic feet of natural gas is based on an energy equivalency conversion method primarily applicable at the burner tip and does not necessarily represent a value equivalency at the wellhead. Given that the value ratio based on the current price of crude oil as compared to natural gas is significantly different from the energy equivalency of 6:1, utilizing a conversion on a 6:1 basis may be misleading as an indication of value. The responses contained herein contain certain information derived from Suncor's Statement of Reserves Data and Other Oil and Gas Information dated February 28, 2019 with an effective date of December 31, 2018 (Reserves Statement). Reserves evaluations have not been updated since the effective date of the Reserves Statement and, thus, do not reflect changes in our reserves since that date. The full particulars relating to Suncor's reserves,



including risk factors, uncertainties and application definitions, are contained in Suncor’s Annual Information Form dated February 28, 2019 which can be obtained without charge from Suncor or by referring to the company’s profile on SEDAR at sedar.com or EDGAR at sec.gov.

C14.1

(C14.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Director of Outreach and Disclosure at Suncor Energy Inc.	Environment/Sustainability manager