



Climate Report 2023

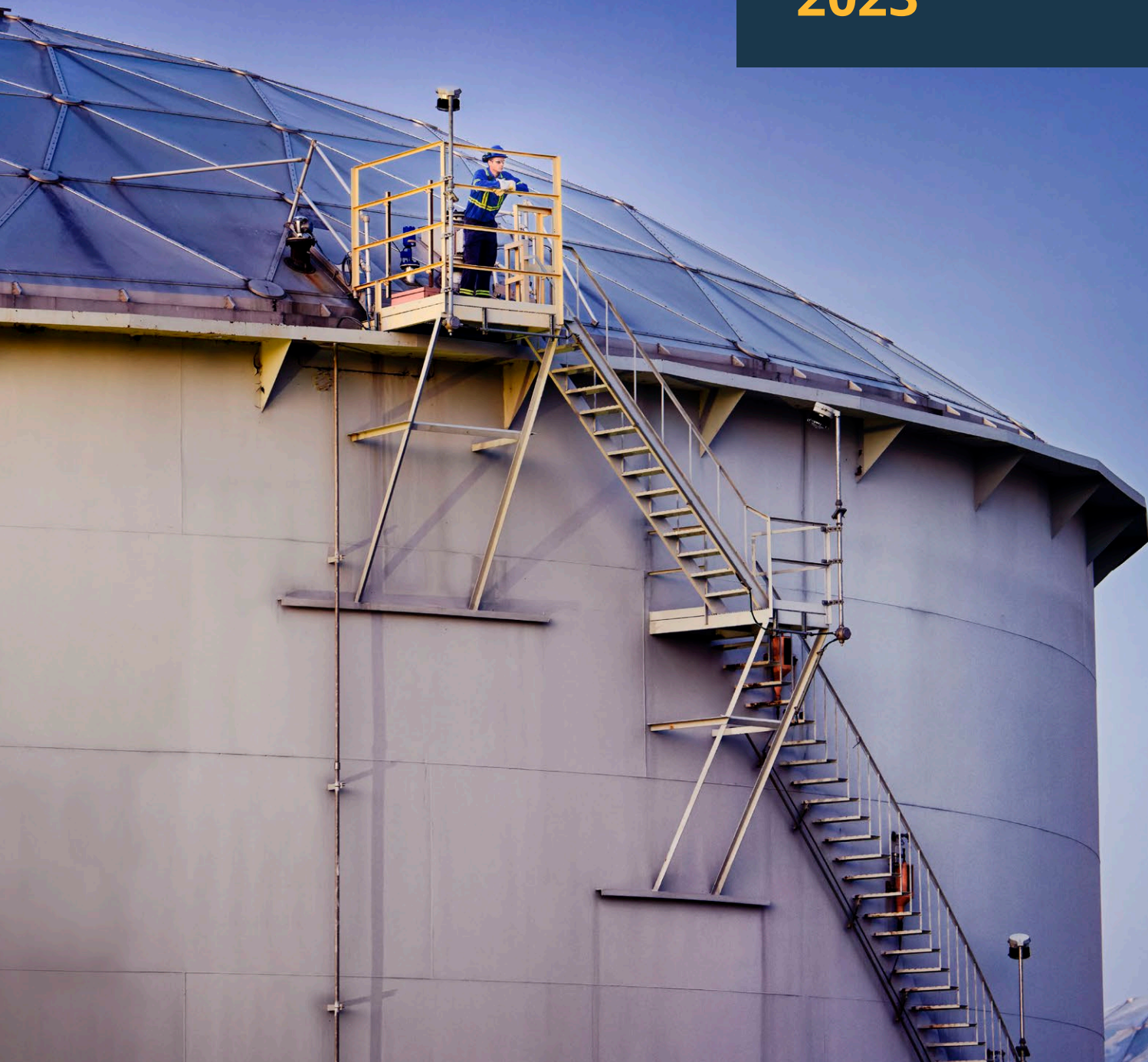




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Introduction

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Executive message



Kris Smith

Chief Financial Officer and
Executive Vice President, Corporate Development



Arlene Strom

Chief Sustainability Officer

Suncor's climate objectives depend on decarbonizing our operations and expanding low-carbon businesses. In this way, we are supporting the energy transition in line with social and consumer expectations and contributing to global energy security, which is underpinned by all forms of energy. Both responsible and secure energy is needed to create a more resilient business – and world.

The strength of Canadian energy is that it is abundant, reliable and backed by achievable climate goals put forward by industry. In fact, within an 18-month period, the oil sands sector announced its ambition to be net zero in its operations and then developed a pragmatic plan to achieve it.

Critical to meeting our climate objectives is the right mix of incentives and fiscal frameworks to make our investments in decarbonization and energy expansion economically viable. Government plays a critical role here in implementing broad-based carbon pricing with effective

credit mechanisms, providing economic incentives, and streamlining policies and regulations. Canadian climate policy is challenging, with a multitude of layers not found in other countries and a focus on regulatory measures. On the other hand, we've seen a strong push for financial incentives in jurisdictions that are keen to promote all forms of low-carbon domestic energy supply, such as Europe and the United States. Simplicity of regulations and fiscal frameworks, balanced with strong economic incentives, will drive certainty for the investment needed to achieve net-zero emissions by 2050.

Executive message

Without this investment and regulatory certainty, there is a real risk of capital flow and carbon leakage outside of Canada, which would diminish the robustness of our industry and our overall Canadian competitiveness. Canada risks falling behind the US, our largest trading partner, especially as it relates to the acceleration of carbon capture and storage (CCS) projects. We need to act, we need to act quickly and we need to act together.

An area of unprecedented collaboration, in terms of shared costs and shared public benefits, is the Pathways Alliance. It is a consortium of Canada's six largest oil sands producers working together with federal and provincial governments to find ways to decarbonize our sector and help Canada meet its climate goals. The Pathways Alliance achieved a critical milestone early in 2023 when it was selected by the Government of Alberta to advance exploratory work for a proposed CCS network in northern Alberta. The project could see more than one billion tonnes of CO₂ stored safely underground. Significant upfront work has been critical but much more work needs to be done, including engagement with more than 20 Indigenous communities. Detailed engineering and field work is progressing rapidly to support a regulatory application later in 2023. This kind of collaboration is key given

the scale of investment required in CCS initiatives. The opportunity to demonstrate global leadership within the energy sector and contribute in a meaningful way to reducing Canada's overall greenhouse gas (GHG) emissions is even more profound.

Our seventh Climate Report and our latest Report on Sustainability show how pivotal this past year has been for Suncor in taking focused action to achieve our climate objectives. With respect to energy expansion, we've lasered in on technologies that fit our core business. This meant we sold our wind and solar assets and prioritized investments in low-carbon fuels and hydrogen – businesses and technologies that connect to our core strengths and which, with prudent investments, offer great potential for growth and scale. Suncor's decarbonization plan for our core business continues to take shape with several large projects identified – anchored on CCS – that will be achieved through collective and Suncor-specific action. We've taken the additional step of linking executive compensation to climate objectives by incorporating enhanced performance metrics centred on the health of the GHG portfolio, the allocation of capital and the achievement of emission reductions. We invite you to read on for more information on our plans, performance and progress.



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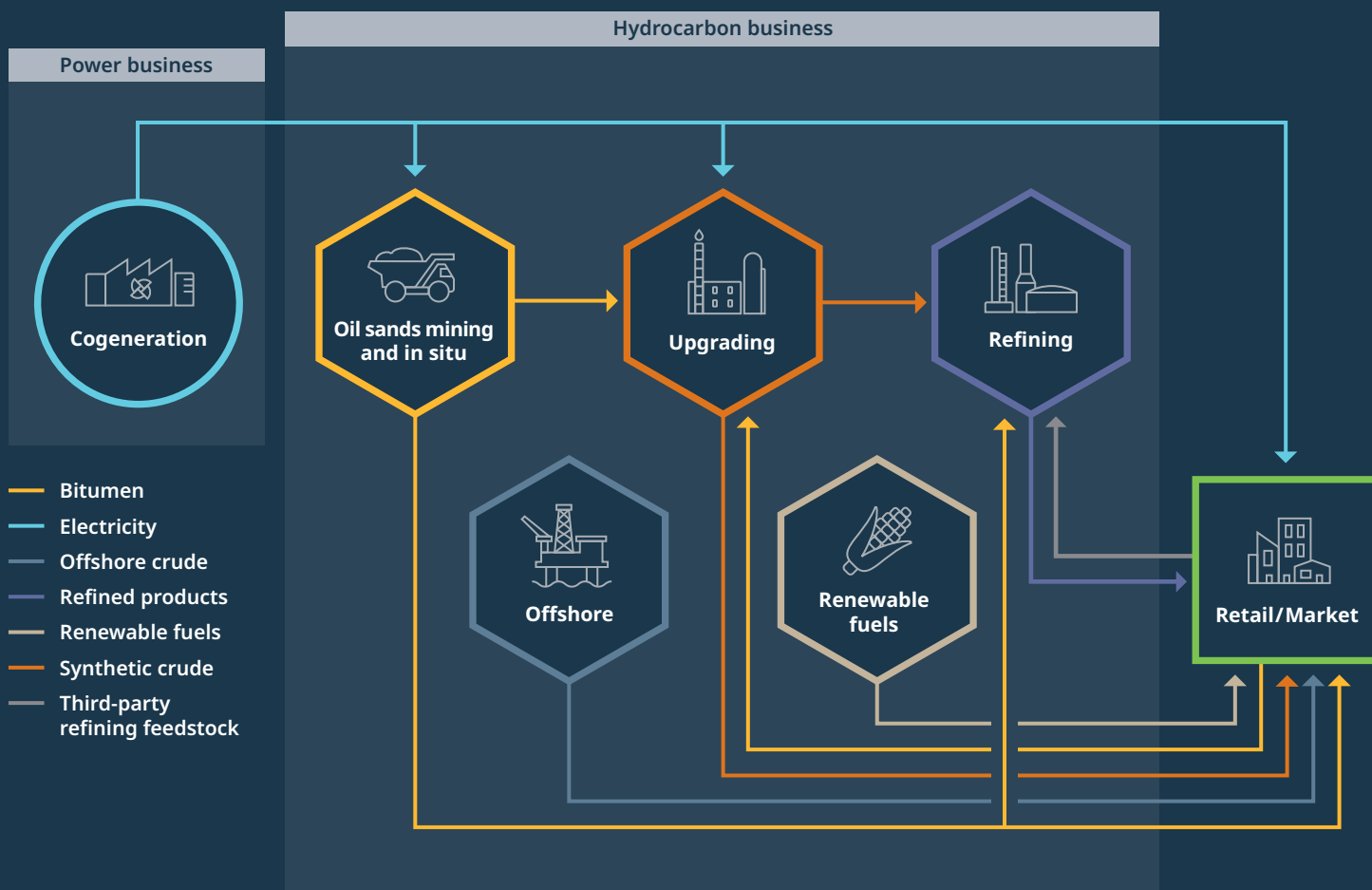
Data restatements

We are changing the way our data is presented within our reports to better represent our integrated model and reflect full operatorship of the Syncrude Project.

Suncor is an integrated energy company focused on oil sands mining and in situ operations, refining and upgrading, and crude and product marketing. We upgrade and refine bitumen into synthetic crude oil and refined products, and sell bitumen and synthetic crude oil to other producers for refining and upgrading. The scale and strength of our physical integration across the value

chain, from production to retail sales, is difficult to replicate. Our oil sands base business is supplemented by offshore oil production and we have made strategic investments in low-carbon power and biofuels to complement our base business. Our energy trading activities focus primarily on the marketing and trading of bitumen, crude oil, refined products and power.

Suncor's production activities and resulting products



Data restatements

Given the complexity of our integrated model, we are updating our reporting methodology to capture total production as the sum of all liquid hydrocarbons produced from our business activities. This recognizes that emissions occur from each production activity, regardless of whether the resulting salable products are internally consumed. This method differs from our Annual Report, which uses production values based on final products sold to market. Our previous reporting of production and GHG intensity deducted product transfers within our business and did not reflect the many activities involved in making both intermediate and final products. Due to this change in methodology, our new and updated production value, is significantly greater than our previous production methodology.* Therefore, our corporate GHG intensity values are lower than previously reported, although absolute emissions remain the same.* To better support peer comparisons,

we are also reporting GHG data by product type, in addition to providing it by facility and business unit.

Since assuming operatorship of the Syncrude Project in September 2021, we have focused on sharing best practices, integrating management processes and incorporating operational and workforce data into Suncor's reporting systems. The data alignment is largely complete and we will continue to provide updates as further improvements are made.

All 2018-2022 performance data in the 2023 Climate Report and Report on Sustainability now includes Syncrude, unless otherwise stated. Five-year performance data (2018-2022) for Suncor-operated facilities, including Syncrude, may be found in our [2023 Sustainability Performance Data](#) document.



* Please see footnotes 3i and 4t which describe the changes to our production and GHG intensity value, respectively.

Our purpose and report highlights

The world relies on a diverse energy mix, most of which will be needed to meet future global energy demand. With the world's third-largest proven oil reserves and over half of global privately investable reserves, Canada has an abundance of secure, reliable energy. Approximately 95% of this potential is in the oil sands, which account for 10% of Canada's GHG emissions. Since the mid-1980s, oil sands production has grown from 200,000 barrels a day to almost three million – a feat of technology and capital – while emissions intensity has fallen by more than 30%.¹ Our biggest challenge today, as a company and industry, is to deploy technology once again – combined with public-private co-investment – to accelerate the decoupling of production and

GHG intensity toward net-zero emissions by 2050. The scale of the challenge before us now is no different from the one that faced a nascent industry; we believe what was once achieved in terms of growth can be possible in terms of our shared GHG ambitions.²

We are one of Canada's oldest and largest integrated energy companies, unique in the combination of our long-term strategy, scale of integration across the value chain, and strong commitment to safe and sustainable operations. These advantages position us well to live our purpose every day and execute on our strategy and objectives with focus and discipline.

Our purpose

To provide trusted energy that enhances people's lives, while caring for each other and the Earth.

Our strategy

To be Canada's leading energy company by optimizing our existing hydrocarbon business and transforming our GHG footprint, while growing our business in low-GHG fuels, electricity and hydrogen, all enabled by our expertise, long-life resources, integrated business model, strong connection to customers and world-class environmental, social and governance performance.

Our climate objectives

We will focus on objectives that build on our strategy and create long-term shareholder value:

- Achieve net-zero emissions by 2050 (scope 1 and 2) and a 10 megatonne (Mt) reduction in emissions across our value chain by 2030
- Reduce emissions in our base business and expand low-emissions businesses
- Work with others to reduce emissions

2022 highlights

28.8 Mt equity emissions
(0.8% increase)

6.5 g/MJ equity emissions intensity
(2.2% decrease)

Update to our climate performance measure

\$540M low-carbon capital spend
(11% of total capital)

14 Mt of potential GHG reduction opportunities by 2030

Alberta's 4th largest power producer*
(formerly 5th)

An updated 1.8°C climate scenario
(replaces our 2°C scenario)

New scope 3 emissions disclosures on our journey to broader decarbonization

*On an operated basis.

Be a net-zero GHG emissions company by 2050 (scope 1 and 2) and contribute to society's net-zero goals
By 2030, reduce annual emissions by 10 megatonnes across our value chain



1 Natural Resources Canada, "Oil sands: GHG emissions," May 2016. Available [online](#).

2 Unless otherwise noted, the statistics in this paragraph are sourced from: CAPP, "Canada's oil sands fact book," March 2022. Available [online](#).

Strategy and objectives

- > Greenhouse gas objectives
- > Reduce emissions in our base business
- > Expand low-emissions businesses
- > Work with others to reduce emissions

Greenhouse gas objectives

Our objective is to reach net-zero greenhouse gas (GHG) emissions by 2050 (scope 1 and 2) and contribute to societal emission reduction goals. We've set an interim objective of 10 megatonnes (Mt) of annual emission reductions across our value chain by 2030. Given our integrated business, we see many opportunities to work with customers, suppliers, governments and other partners to help reduce emissions throughout the energy system (including scope 3), by improving access to low-carbon products and services.

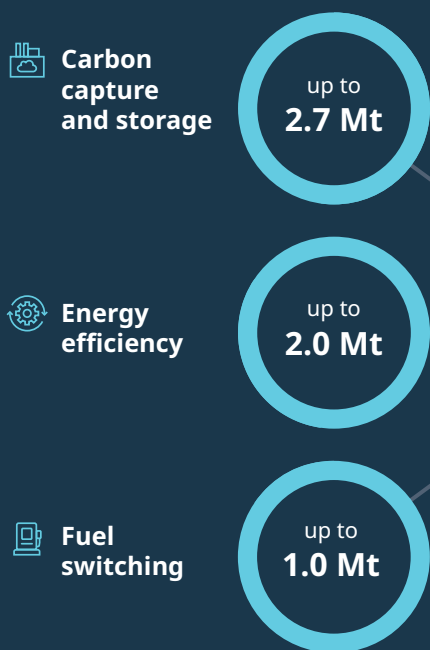
Since our 10 Mt objective will be realized across the energy value chain – in our operations and through the consumption of our products – it has no fixed emissions baseline. We will count sustained improvements that relate to a direct intervention or investment by Suncor that were implemented beginning in 2020.

We are advancing and exploring a suite of projects to reach our objectives. Our focus is twofold: first, on reducing base business emissions with fuel switching, energy efficiency, and carbon capture

GHG reduction opportunities to 2030¹

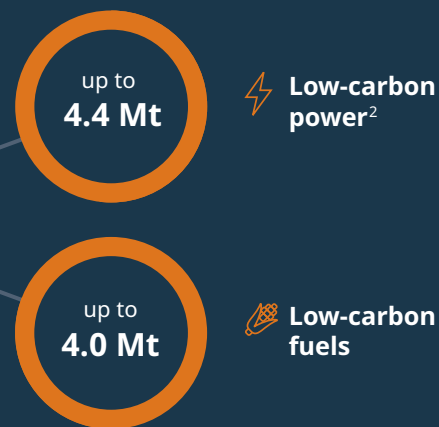
Base business

Contributing to Suncor's net-zero goal



Value chain

Reducing our customers' footprint



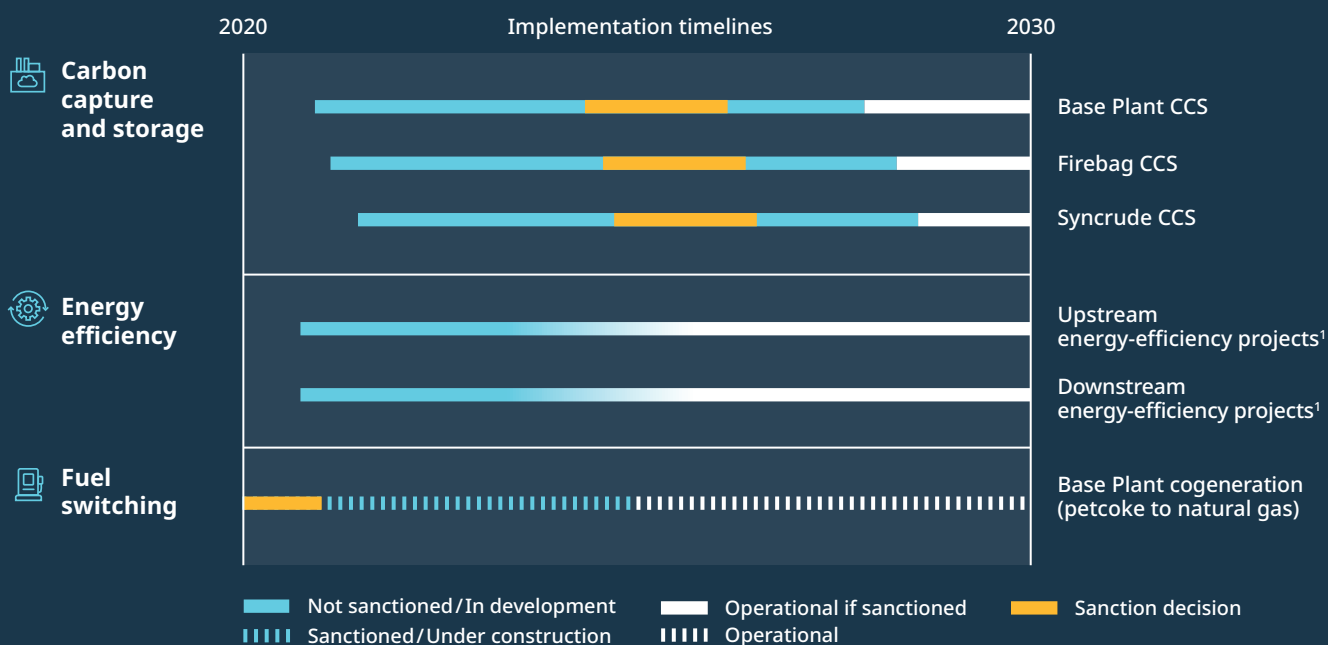
¹ The emission reduction opportunities we are evaluating are in excess of 10 Mt.

² Compared to coal power, calculated based on the displacement of coal power at time of sanction.

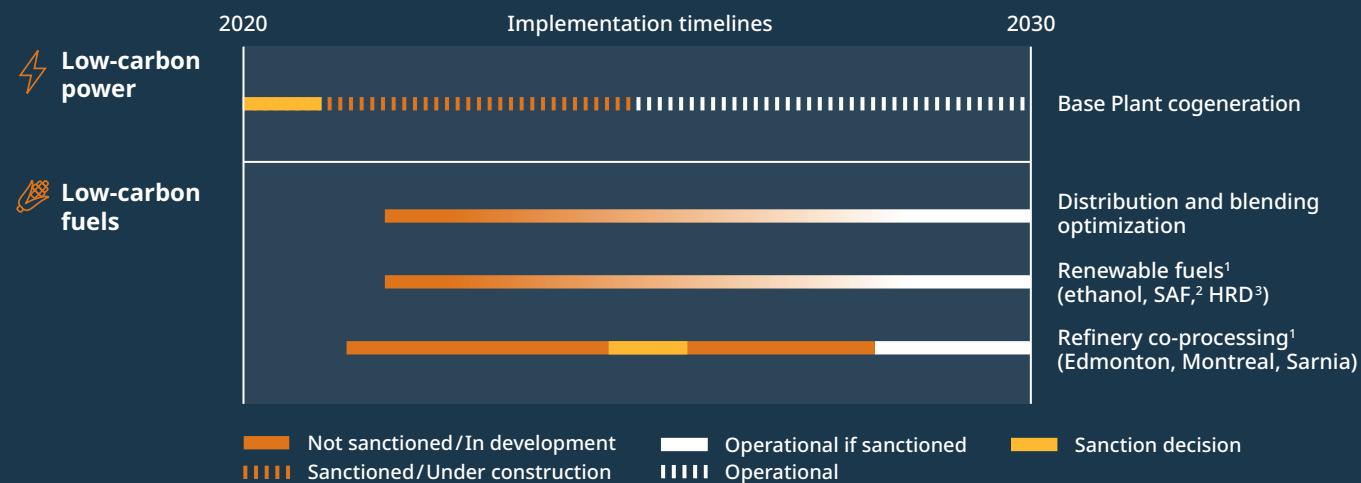
Greenhouse gas objectives

Base business and value chain emission reduction projects

Base business



Value chain



¹ Represents a portfolio of opportunities and not an individual capital project; therefore, no single sanction decision is shown.

² Refers to sustainable aviation fuel.

³ Refers to hydro-treated renewable diesel.

Greenhouse gas objectives

and storage (CCS), and second, to grow profitable businesses in low-carbon power, renewable fuels and low-carbon hydrogen.

From 2021 to 2025, we expect to spend approximately 10% of our annual capital budget, on average, on projects aimed at lowering our emissions and advancing low-carbon energy offerings, of which a significant portion would be allocated to projects that provide strong, double-digit returns. In 2022 we allocated approximately

\$540 million, or 11% of total capital and 35% of economic capital, to low-carbon initiatives, much of which was allocated to the Base Plant Cogeneration project. We are allocating additional funds and resources to a portfolio of early-stage decarbonization initiatives, primarily in the design and development stage, to advance base business optimization and low-carbon business expansion.

Technology design, development and deployment portfolio

Design

Technology ready for demonstration or in an earlier phase

Develop

Technology currently in a pilot or demonstration phase

Deploy

Technology deployed to a commercial project that is operating or being constructed

Reduce emissions in our base business

- Solvent-dominated extraction

- Emerging carbon capture and storage technology (e.g., Svante)

- Fuel-switching (e.g., Base Plant Cogeneration)

- SAGD enhancement (e.g., ELITE,¹ lean zone mitigation)

- Solvent-aided extraction (e.g., ES-SAGD²)

Expand low-emissions business

- Turquoise hydrogen

- Alternative products (e.g., carbon fibre)

- Co-processing renewable feedstocks

- Blue hydrogen

- Green hydrogen

- Hydrogen for transport (e.g., AZETEC,³ AZEHT⁴)

- Renewable fuels (e.g., Enerkem, LanzaJet, LanzaTech)

Time to implementation

- 7-10 years

- 4-6 years

- 0-3 years

- Operational

¹ Refers to Extra Low Intensity Thermal Extraction.

² Refers to Enhanced Solvent Steam Assisted Gravity Drainage.

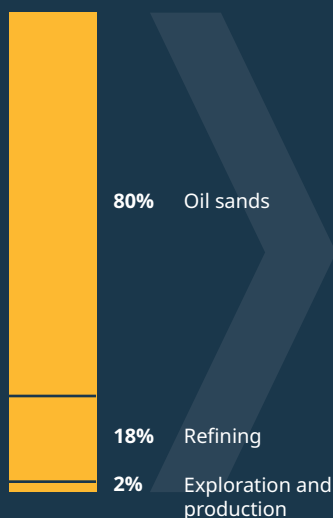
³ Refers to Alberta Zero Emissions Truck Electrification Collaboration.

⁴ Refers to Alberta Zero Emission Hydrogen Transit.

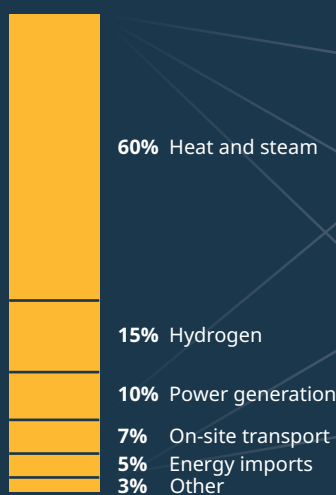
Reduce emissions in our base business

Suncor's carbon emissions*

By segment



By process



Base business reduction opportunities

(Scope 1 and 2)



Carbon capture and storage



Energy efficiency



Fuel switching

About half of oil sands emissions come from just 16 assets, providing significant advantages in the efficiency of reducing emissions with CCS, fuel switching and energy-efficiency measures.

* This figure represents a typical breakdown of Suncor's carbon emissions. Actual percentages vary each year.

Suncor's base business consists of oil sands mining, in situ and upgrading operations, offshore production, and refining and marketing operations. Over the past decade, we've made significant investments in projects and technologies to lower our base business GHG emissions. For example, we deployed leading technologies at our Fort Hills mine that improve product value and efficiency. The resulting emissions intensity is similar to the average imported barrel refined in North America, on a full life-cycle basis.³ We continue to invest in commercial pilots of in situ solvent technologies that have the potential to lower emissions by 30-50%. We are also on track to deliver a fuel-switching project at our Base Plant mine by mid-decade that will replace energy generation using petroleum coke with highly efficient gas cogeneration. This project will reduce emissions associated with our steam production by approximately one megatonne per year, along with providing low-carbon power to the Alberta grid.

Throughout our 50-year history, the oil sands have been at the core of our business and we will continue to produce this resource

for many decades, while improving our emissions performance. We have a relative advantage in the proximity of our assets and the concentration of our emissions. Just five processes account for 97% of our oil sands emissions, of which approximately 60% is associated with heat and steam production, 15% with hydrogen production, 10% with power production, 7% with on-site transport and 5% with energy imports. CCS is a commercially available technology that is the leading option to decarbonize most of these emissions, and we continue to look at other decarbonization options. Fuel switching to low-carbon-intensity fuels could address additional power generation, on-site transportation and a substantial portion of our heat and steam emissions. Energy-efficiency projects can also be implemented throughout our operations to provide near-term incremental reductions in energy use and emissions. The following are examples of the technologies and projects that have the greatest potential for base business emission reductions, as well as novel areas of research we are exploring.

³ Kevin Birn et al., "The Right Measure: A Guidebook to Crude Oil Life-cycle GHG Emissions Estimation," S&P Global, Multiclient study, March 2022. Available [online](#).

Reduce emissions in our base business

Carbon capture and storage

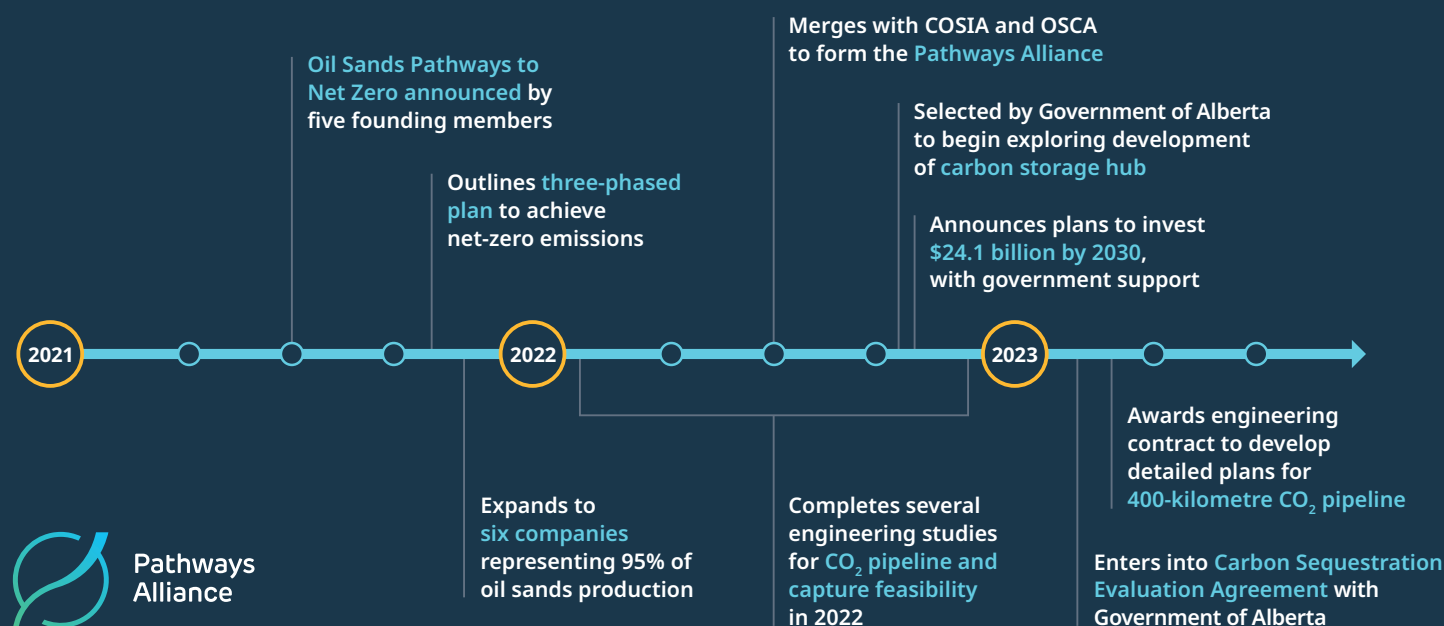
CCS is a critical technology for meeting global energy and net-zero climate objectives and is recognized by most energy forecasts as key to achieving the goals of the Paris Agreement. CCS involves capturing and sequestering carbon dioxide (CO₂) from large point sources. According to the International Energy Agency (IEA), 7.6 gigatonnes of CO₂ capture capacity would be needed by 2050 under the IEA's Net Zero Emissions by 2050 scenario, of which 50% is tied to fossil fuels.⁴ According to the Global CCS Institute, as of September 2022, the total capacity of CCS projects in development was 244 Mt of CO₂ per year, representing close to 200 projects, an annual increase of 44%⁵ and indicative of the challenge ahead. Alberta is one of the best jurisdictions in the world for CCS due to the province's geology and the experience of its oil and gas industry with geological storage. Canada's Western Canadian Sedimentary Basin, encompassing Alberta, is rated as one of the most suitable regions in the world for carbon storage by the Global CCS Institute. CCS will be a critical component of our net zero by 2050 efforts and we are collaborating across the industry and with governments to implement it at scale.

Pathways Alliance

Suncor is a founding member of the Pathways Alliance,⁶ a globally unprecedented collaboration responsible for 95% of Canada's oil sands production. The Pathways Alliance has the objective to reduce annual emissions from oil sands operations by 22 million tonnes by 2030 and achieve net-zero emissions from production by 2050. This ambitious objective of the Pathways Alliance producers, supported by the governments of Canada and Alberta, is crucial to meeting Canada's climate commitments. Suncor demonstrates strong leadership at Pathways, as a member of the Pathways CEO and Steering committees, by chairing the Indigenous and Community Relations and Projects subcommittees, and by participating in all the other Pathways Alliance teams.

The Pathways Alliance foundational project is a key part of the overall net-zero vision and will require ongoing collaboration, shared investment, and research and development on new and emerging technologies between industry and government. The foundational project will include a carbon transportation line connecting over 20 oil sands facilities in northern Alberta to a

Pathways Alliance progress



⁴ Stéphanie Bouckaert et al., "Net Zero by 2050 – A Roadmap for the Global Energy Sector," International Energy Agency, Special report, October 2021 (4th Revision). Available [online](#).

⁵ Matt Steyn et al., "Global Status of CCS 2022," Global CCS Institute, 2022. Available [online](#).

⁶ In 2022, the Oil Sands Pathways to Net Zero Alliance merged with Canada's Oil Sands Innovation Alliance (COSIA) and the Oil Sands Community Alliance (OSCA) into a single organization called the Pathways Alliance.

Reduce emissions in our base business

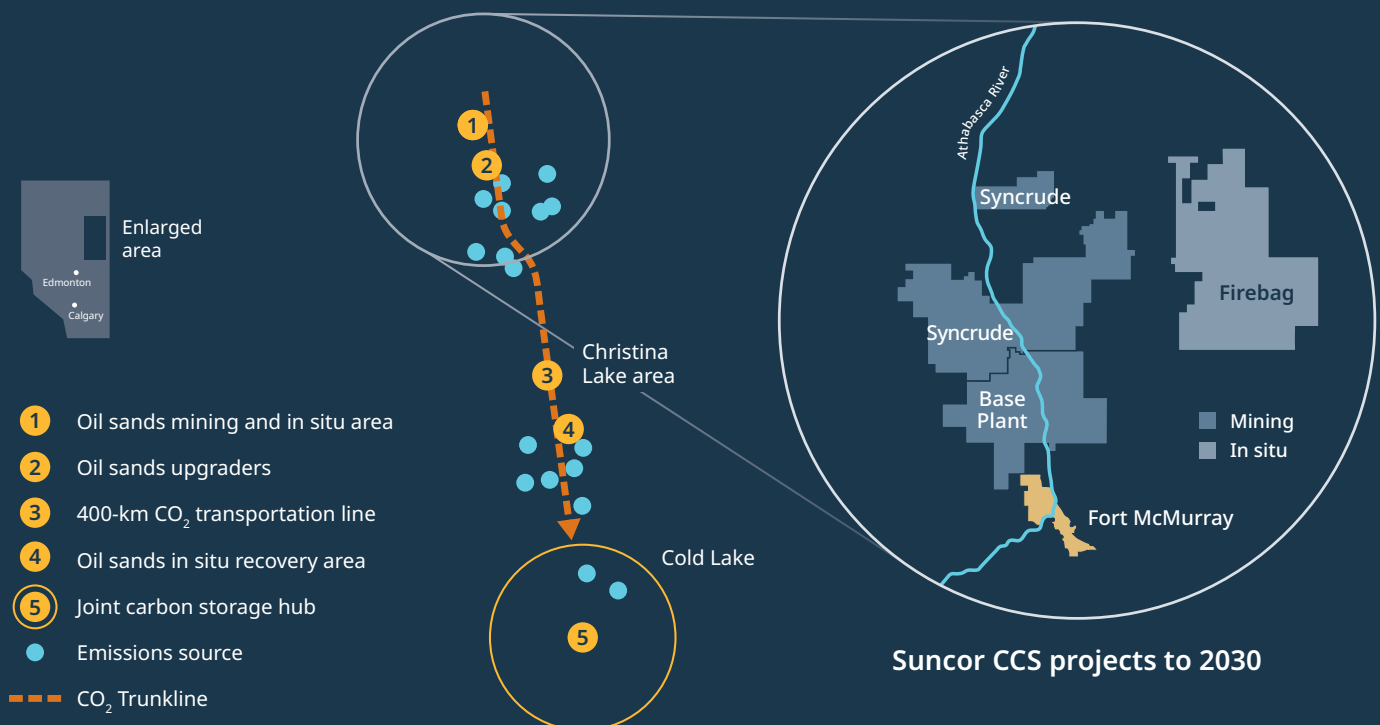
carbon sequestration hub near Cold Lake and will be available to other industries interested in capturing and sequestering CO₂. The proposed CO₂ sequestration and storage network will be among the largest such facilities in the world, capable of safely storing more than one billion tonnes of CO₂ in deep underground geological formations. Other projects and technologies under evaluation include electrification, fuel substitution (e.g., hydrogen to displace natural gas), process improvements (e.g., solvent-based extraction) and small modular nuclear reactors for industrial heat.

Despite forming less than two years ago, the Pathways vision has progressed quickly, with key early milestones already achieved. In 2022, member companies carried out several engineering studies for CO₂ capture feasibility at oil sands facilities. This included completing pre-engineering work on the 400-kilometre CO₂ pipeline that will connect facilities to the CO₂ storage network and environmental studies to support CO₂ transport and storage regulatory applications. In early 2023, Pathways entered into a Carbon Sequestration Evaluation Agreement with the Government of Alberta, which allows for a detailed evaluation of the geological properties of the proposed CO₂ storage hub to support further regulatory approvals. It also awarded engineering work to begin detailed planning for the 400-kilometre CO₂ pipeline.

Additionally, the alliance awarded Calgary-based [Impossible Sensing Energy](#) first prize in a global competition to accelerate the use of oil sands steam-reducing technologies, which are currently being used in space applications. Replacing steam with solvents could result in a substantial reduction of CO₂ emissions and is advantageous in operations that are not well-suited to carbon capture.

With joint funding from the federal and provincial governments, the Pathways Alliance anticipates an investment of \$24.1 billion by 2030 would be needed to support the first phase of its plan, of which \$16.5 billion will support the carbon capture and storage network and \$7.6 billion will support other emission-reduction projects and technologies. The 2022 Canadian federal budget included a 50% investment tax credit for CCS projects and a 37.5% investment tax credit for associated pipelines and storage hubs. The Pathways Alliance welcomed the news as a critical contribution to its shared goal of net-zero emissions by 2050. The alliance continues to work with the Canadian and Albertan governments on the necessary financial and regulatory conditions to support key investment decisions, promote global competitiveness and ensure oil sands emission reduction targets are realistic and achievable. In parallel, it is engaging with the many Indigenous and other communities along the CO₂ corridor and progressing key milestones in anticipation of final investment decisions.

Pathways Alliance proposed carbon sequestration network



Reduce emissions in our base business

Svante

Suncor is an investor in Svante Technologies Inc. (Svante), which is developing a post-combustion CO₂ capture technology for industrial emissions. Svante's technology separates and captures CO₂ from combustion gas products and concentrates it for industrial use or permanent storage. The capture process is based on adsorption, which uses solid materials with very high storage capacity relative to their size, dramatically reducing the time and surface area needed for storage, and with the potential to reduce costs. Suncor has completed a technical feasibility study to capture CO₂ emissions from the fluid catalytic cracker at the Edmonton refinery to inform further economic and technical evaluation for deployment. The next step is a front-end engineering design study to continue evaluating this opportunity, which is supported by Emissions Reduction Alberta and Natural Resources Canada. Suncor's investment supports Svante in accelerating the commercial-scale deployment of a technology that can be applied at most of our facilities, at a potentially lower cost than conventional CO₂ capture systems for contaminated or difficult-to-capture CO₂ streams.

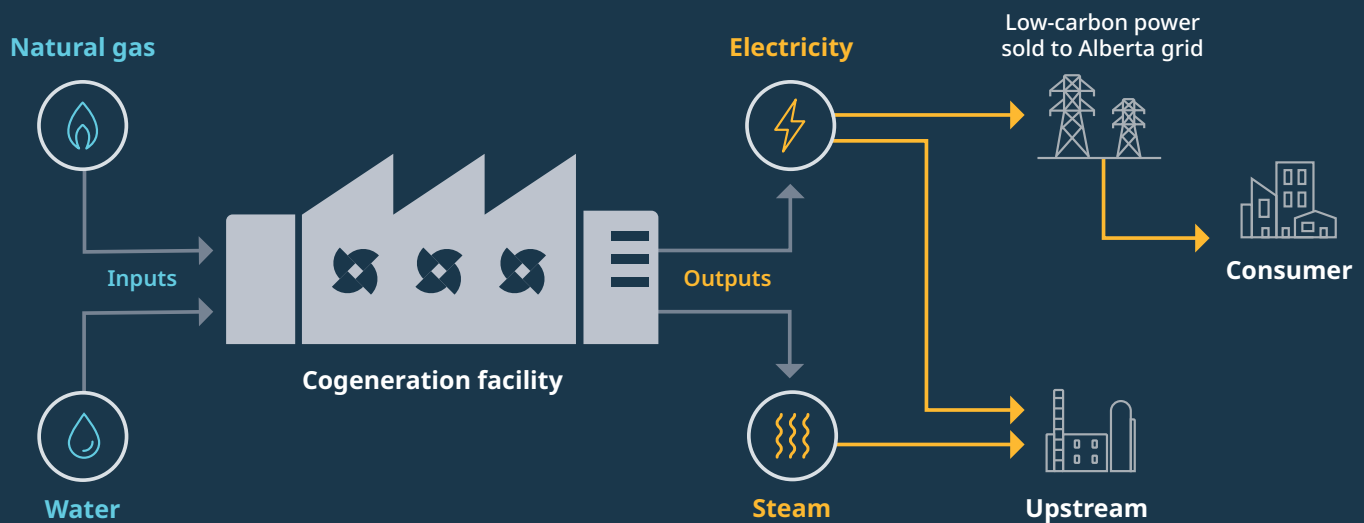
Fuel switching

Fuel switching is substituting a fuel with a higher GHG intensity with a fuel that has a lower GHG intensity, such as substituting coal with hydrogen or natural gas to produce industrial heat or generate electricity. Our Base Plant Cogeneration project is one such example.

Cogeneration

Cogeneration is the process of producing both steam and electricity using natural gas and is the lowest-carbon base-load power supply economically feasible today. Our oil sands facilities use cogeneration to meet steam and electricity needs. The Base Plant Cogeneration project will replace existing coke-fired boilers with a modern natural gas-fired cogeneration plant, significantly lowering the emissions associated with steam generation and exporting low-carbon power to the grid. The project is expected to be commissioned by late 2024 and will result in approximately one megatonne per year of direct emission reductions from steam generation. Additional benefits from the export of low-carbon power are discussed on [page 16](#).

Cogeneration process



Benefits from the cogeneration project are made up of fuel switching (petroleum coke to natural gas, approximately 1 Mt CO₂e) and low-carbon power exports (the difference between cogeneration power intensity and coal power intensity at the time of project sanctioning, approximately 4.4 Mt CO₂e).

Reduce emissions in our base business

Process optimization, energy efficiency and reliability

Efficient use of our resources is closely tied to operational excellence and is one of our strategies to reduce base business emissions. We have a portfolio of over 100 energy-efficiency concepts being assessed through our development process, aimed at reducing energy requirements and costs. These initiatives are focused on incremental efficiency gains through process optimization, upgrading aging equipment during replacement and maximizing heat integration. We are targeting the development of a portfolio with the potential to reduce emissions by 2 Mt annually.

Solvent, SAGD efficiency and heat-recovery technologies

SAGD enhancement processes

Steam-assisted gravity drainage (SAGD) enhancement processes include the use of solvents, reduced pressure operations and lean zone mitigation for in situ bitumen recovery. These processes have the potential to lower costs, reduce the steam-to-oil ratio and lower GHG emissions intensity by up to 30%. An example is Enhanced Solvent SAGD (ES-SAGD), a process that involves partial replacement of steam with a hydrocarbon solvent. In 2020 we completed the solvent injection phase of a pad-scale ES-SAGD pilot at Firebag and in November 2022 we started a pad-scale demo to further evaluate production performance and solvent recovery. Another opportunity we are pursuing, the Extra Low Intensity Thermal Extraction (ELITE) process, improves the energy efficiency of SAGD by significantly lowering operating pressures and temperatures. In early 2021 we initiated a two-year pad-scale pilot project at Firebag to evaluate the effectiveness of the ELITE process. This pilot has reached its target operating conditions and its performance so far is consistent with pre-pilot expectations.

In the lean zone mitigation process, injecting gas into areas of lower bitumen content improves the energy efficiency of SAGD by improving bitumen yield and lowering steam requirements. We implemented our first multi-year pilot in 2017 and a second pilot will be implemented in mid-2023.

SAGD solvent-dominated processes

Solvent-dominated processes involve the full or near-full replacement of steam with a hydrocarbon solvent and have the potential to reduce GHG emissions by up to 50%. These technologies could include solvents paired with wellbore heating, super heating or electromagnetic heating, with the addition of steam. We expect to make a sanction decision on a pilot project to evaluate solvent-dominated technology by late 2023.

Bitumen processing

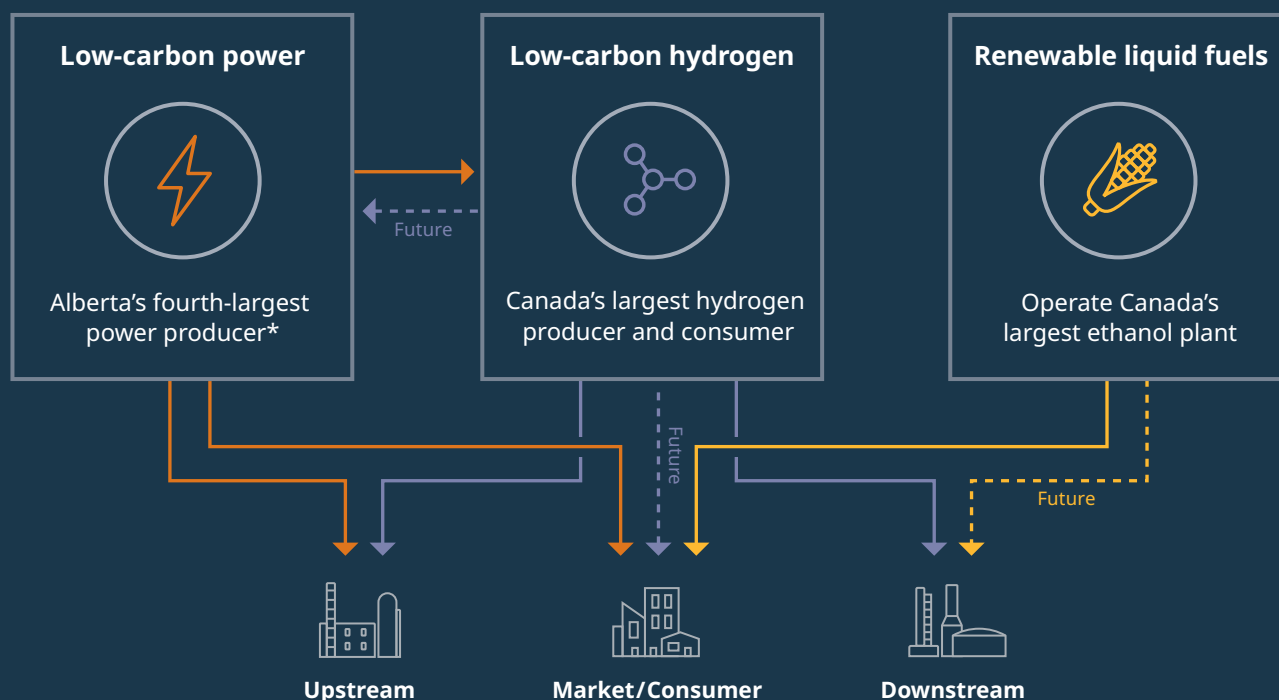
Suncor's oil sands production is primarily focused on synthetic (i.e., upgraded) crude oil and bitumen. Bitumen is oil that is too heavy or thick to flow on its own, and therefore it is mixed with diluent so it flows more easily. To reduce or eliminate the amount of diluent required, thermal bitumen conversion and separation technology is used to partially upgrade bitumen. This lowers production and upgrading costs, increases product quality and value, improves market access, and lowers life-cycle GHG emissions. An example of a separation application is the use of paraffinic froth treatment in the secondary extraction process at Fort Hills, which selectively removes the heavy components of the mined bitumen, resulting in a lighter, higher-quality product. Technologies with both thermal conversion and separation can also remove process water and steam, eliminating the need for a steam plant and water treatment, thereby providing additional environmental benefits and cost savings.

Expand low-emissions businesses

Increase low-carbon power generation capacity

Expand into low-carbon hydrogen production

Grow advanced-generation renewable liquid fuels



*On an operated basis.

To achieve our climate objectives, we are working to decarbonize our base business and expand low-emissions businesses. This means allocating investments to areas that leverage our core strengths and offer opportunities for future growth. Our expanded energy offerings will be in business lines we understand well – low-carbon power, renewable fuels and hydrogen.

Our plans include:

- commissioning our Base Plant Cogeneration project by mid-decade and growing our low-carbon generation capacity to supply Alberta homes and businesses
- continuing to make modest, but targeted, investments in developing commercial-ready renewable fuel technologies that provide an early-mover advantage and support future expansion (e.g., Enerkem, LanzaTech, LanzaJet)
- becoming an active participant in the low-carbon hydrogen economy by 2030.

*On an operated basis.

Low-carbon power

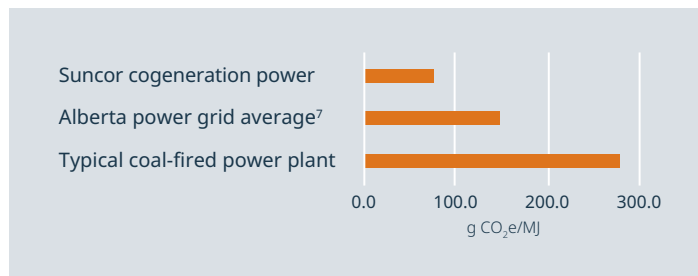
Suncor has been in the low-carbon power business for more than 20 years, with a focus on natural gas cogeneration.

Cogeneration

Our cogeneration facilities were initially developed to provide steam and electricity for our oil sands assets. As our cogeneration portfolio has evolved, we've become the fourth-largest power producer* in Alberta, exporting roughly a third of the 1,200 megawatts (MW) of electricity we generate. Cogeneration is an optimal low-carbon replacement for Alberta's coal-fired power plants, which are being phased out, and for backing up intermittent renewable energies like wind. When it comes online, the GHG intensity of the Base Plant Cogeneration project will be approximately 75% lower than the typical coal-fired power plant it is replacing and approximately 40% lower than the current Alberta power grid average. The project was designed to produce excess energy and will make it possible to export an additional 800 MW of

Expand low-emissions businesses

baseload electricity capacity to Alberta's provincial grid, equivalent to roughly 12% of Alberta's 2021 average electricity demand. Following its commissioning in late 2024, we estimate that we'll be the third-largest power producer* in Alberta. The cogeneration project has an expected rate of return of over 20%.



Renewable power

Suncor played a pivotal role in developing and maturing the Canadian wind energy industry. In 2002, we helped build one of the first utility-scale wind farms in Canada. Suncor has since developed nine wind power projects in three provinces, including phase one of the Forty Mile project in Alberta, representing 200 MW of wind capacity that came online in 2022. In January 2023, we sold our renewable power portfolio to sharpen our focus on renewable fuels and hydrogen. Moving forward, we will continue to participate in many aspects of the electricity value chain, including producing low-carbon power through our integrated cogeneration operations, power marketing and trading, providing customers with electric vehicle charging and potentially procuring renewable power through power purchase agreements.



The Base Plant Cogeneration construction team celebrating the setting of the gas turbines and generators.

⁷ Government of Alberta, "Carbon Offset Emission Factors Handbook, Version 3.1, February 2023. Available [online](#).

*On an operated basis.

Expand low-emissions businesses

Renewable fuels

Renewable fuels offer a practical solution for decarbonizing modes of transport for which electricity and hydrogen technologies are not well suited, such as aviation, trucking and shipping. We started producing renewable fuel in the mid-2000s at our St. Clair ethanol plant in the Sarnia-Lambton region of Ontario. Our current focus is on growing a portfolio of advanced-generation renewable fuels through strategic partnerships and commercial development opportunities, with a view to managing compliance with low-carbon fuel requirements and developing profitable businesses. We see a significant opportunity to satisfy global demand growth for low-carbon fuels and to generate

Life-cycle benefit of renewable fuels

The GHG benefit of renewable fuels is that the carbon sequestered from the atmosphere during the growth of the feedstock is equivalent to the carbon emitted during its end-use combustion, greatly reducing the renewable fuels' emissions intensity on a life-cycle basis, compared to conventional fuels. Suncor's renewable fuels technology development aims to further improve the life-cycle emissions of biofuels by improving feedstock sourcing, processing and transport, as well as advancing the development of novel transformation pathways and waste-based feedstocks.

shareholder value, leveraging our experience with liquid fuels, logistics capabilities and existing asset base.

Over the past decade, we've made strategic investments in promising advanced-generation technologies to create ethanol and methanol from waste streams such as non-recyclable municipal waste, industrial forestry residue and agricultural waste biomass, most of which have reached pilot demonstration levels of development. We have invested in leading renewable fuel companies and continue to advance a handful of key projects. We are also looking at opportunities for co-processing oils and waste grease feedstocks at our refineries to produce low-carbon diesel and jet fuel. These investments are critical to developing cost-effective ways to meet future regulatory requirements, while keeping Suncor at the forefront of innovation and technology deployment to meet our GHG objectives.

Renewable ethanol, methanol and other low-carbon products

St. Clair

We operate Canada's largest ethanol plant, which produces approximately 400 million litres of ethanol annually to meet blending requirements for our 1,700 Petro-Canada™ retail and wholesale stations. Our process uses the starches from corn-based feedstock and the remaining material is used to make cattle feed and corn oil. We are working on lowering the life-cycle GHG intensity of the facility and exploring several projects and technologies, such as converting dry distilled grains to advanced cellulosic ethanol.



Expand low-emissions businesses

Enerkem

Enerkem's unique technology takes waste streams such as municipal solid waste, which would otherwise be landfilled, and converts them into syngas (a mixture of carbon monoxide, CO₂ and hydrogen) using a thermochemical technology. The produced syngas can be transformed into higher-value products like methanol and ethanol. These are low-carbon products that can be blended into conventional fuels or further upgraded into renewable fuels and chemicals. In addition to our direct investments in Enerkem, we have seconded employees to projects, including the 38 million litre per year Enerkem Alberta Biofuels facility in Edmonton, to provide operational support and increase operational discipline based on Suncor's extensive experience. In 2014, this facility was the first commercial-size facility in the world to produce ethanol from waste and continues to use non-recyclable and non-compostable household waste from the City of Edmonton to produce low-carbon ethanol and methanol.

Suncor is also an investor and actively involved in the construction of the 125 million litre per year Varennes Carbon Recycling bio-refinery in Varennes, Quebec. The plant is based on Enerkem's second-generation technology and will use non-recyclable commercial and industrial waste and forest residue to produce biomethanol. The facility will use green hydrogen in the process, powered by what will be one of North America's largest electrolyzers.

LanzaTech

LanzaTech's carbon recycling technology uses novel gas fermentation whereby carbon monoxide and CO₂ from industrial emissions and waste are used as food for bacteria to produce the building blocks for renewable fuels and chemicals. The LanzaTech technology works with industrial off-gases including syngas (a mixture of carbon monoxide, CO₂ and hydrogen) generated from waste biomass such as municipal solid waste or agricultural waste, and reformed biogas. In this case, carbon-rich gas that would otherwise be combusted and emitted as CO₂ is captured and used. LanzaTech technology currently produces ethanol that is used for transportation fuel blending. Ethanol can also be converted into sustainable aviation fuel (SAF) by a process is being scaled by LanzaJet in the US.

Suncor has partnered with LanzaTech for over a decade to support the development of LanzaTech's patented technology portfolio for potential deployment within our existing operations and to develop advanced-generation biofuel facilities. We are collaborating on a project to scale up and demonstrate LanzaTech's next-generation gas fermentation technology in partnership with Emissions Reduction Alberta, Alberta Innovates and the Government of Canada. The project uses waste biomass-derived syngas and the fermentation of syngas to produce ethanol. Construction of the Suncor-operated, eight barrel per day pilot facility in the Edmonton area was completed in early 2022, and it began producing ethanol in July 2022.

Sustainable aviation fuel

LanzaJet

Formed in 2020 as a spin-out from LanzaTech, LanzaJet is focused on commercializing an alcohol-to-jet technology to produce SAF and renewable diesel from ethanol. Suncor is a founding investor in LanzaJet, alongside Mitsui & Co. and LanzaTech, followed by investments from Shell and British Airways, and additional non-dilutive capital from Breakthrough Energy Ventures and the Microsoft Climate Innovation Fund. LanzaJet's commercial biorefinery in Georgia, US, will produce 38 million litres per year of renewable fuels, primarily SAF. Suncor will market approximately 40% of the SAF and all the renewable diesel produced at the facility to jet fuel and distillate customers. Construction of the plant will be completed in 2023, with production expected in the fourth quarter.

Hydrogen

Suncor is the largest producer and consumer of hydrogen in Canada. We produce grey hydrogen through steam methane reforming of natural gas, a critical process in our upgrading and refining operations for 50 years. Given our significant experience, we're well positioned to leverage the use of hydrogen to decarbonize our operations. Hydrogen – including blue, turquoise and green hydrogen technologies – could also play a meaningful role in future energy supply for other industrial uses, residential heating and heavy-duty, long-haul transportation.

Blue hydrogen

Blue hydrogen is produced by combining natural gas with steam and a catalyst to generate hydrogen and carbon dioxide, which is captured and stored. Blue hydrogen is well-suited in areas with access to low-cost natural gas and suitable geology for carbon capture and storage, like north-central Alberta. We continue to explore opportunities in blue hydrogen production.

Green hydrogen

In regions that have good access to low-carbon electricity and water, where the geology does not support carbon sequestration, electrolysis may emerge as the preferred technology. Electrolysis involves splitting water into hydrogen and oxygen using renewable electricity. We are supporting the development and construction of an 80 MW electrolyzer as part of our investment in the Varennes Carbon Recycling plant and evaluating other potential projects ranging from 1 MW to 20 MW in size.

Turquoise hydrogen

Turquoise hydrogen involves a process of decomposing natural gas using high temperatures to produce hydrogen and solid carbon. The solid carbon can then be used as a feedstock for other industries and products, including concrete, asphalt, tires and

Expand low-emissions businesses

Low-carbon hydrogen opportunities

Conventional production

Potential alternatives

Grey hydrogen

Produced from natural gas and steam and is generated and used at Suncor's refineries and upgraders.

**Blue hydrogen***

Produced from natural gas and steam and involves carbon capture and storage, making it about 90% emissions-free.

**Green hydrogen**

Produced from water without generating CO₂, making it virtually emissions-free (if the electricity used in the process is from a low-carbon source).

**Turquoise hydrogen**

Uses natural gas to generate hydrogen and solid carbon and provides a lower-GHG product.



15% of Suncor's emissions are from hydrogen production. New low-carbon hydrogen technology unlocks significant emission reduction opportunities.

* Grey hydrogen equipment can be modified/retrofitted to produce blue hydrogen.

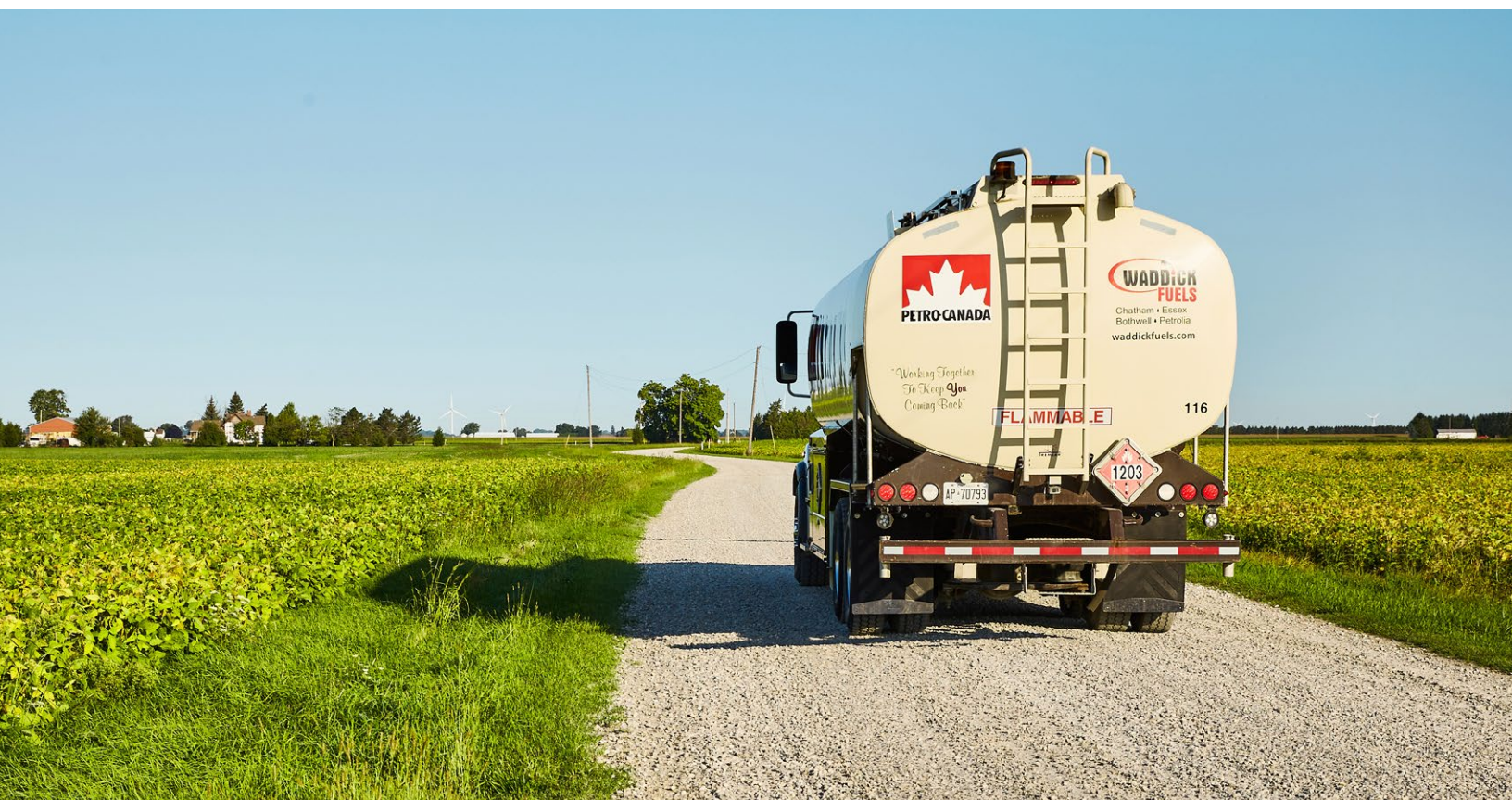
batteries. Turquoise hydrogen has the potential to be a low-cost, low-carbon method of hydrogen production, especially in regions with access to low-carbon power and where CO₂ storage is not available. We continue to evaluate low-carbon turquoise hydrogen supply technologies.

Alternative products**Carbon fibre**

Carbon fibre, which can be derived from bitumen, has extraordinary strength-to-weight properties, making it ideal for many manufacturing applications (e.g., auto and airplane parts, building materials and wind turbines). In addition to its light weight, strength and durability, carbon fibre is a non-combusted

product that can be derived from bitumen with lower life-cycle GHG emissions. Certain bitumen fractions as well as intermediate or waste byproducts generated in Suncor's upgrading and refining operations are an inexpensive, abundant and reliable feedstock for producing carbon fibre, making it a potentially high-value opportunity to diversify oil sands production into non-emitting products. Carbon fibres are very safe to transport. Suncor has established a technology development program that is exploring the possibility of converting portions of bitumen, starting with asphaltenes, to general purpose, activated and high-performance carbon fibre. Our current focus is on lab-scale bitumen feedstock preparation and generation of carbon fibre threads to determine subsequent phases of development.

Work with others to reduce emissions



Grow our customer connection

As an integrated energy company, we can influence the GHG profile of our entire value chain. In our wholesale and retail distribution business we provide customers with a variety of fuel and service offerings, including renewable fuel and low-carbon power. While liquid fuels blended with first-generation biofuels comprise the bulk of transportation energy today, advanced-generation renewable fuels, electric vehicle infrastructure and hydrogen fuel are all expected to grow. As transportation options and infrastructure evolve, we intend to expand our offerings of low-carbon alternatives to customers through our Petro-Canada™ wholesale and retail business by:

- growing our renewable fuels business to support increasing wholesale and retail demand
- expanding our coast-to-coast network of 57 electric vehicle fast-charging locations
- exploring low-carbon hydrogen transportation solutions
- working with governments to develop fuel standards that provide affordable, low-carbon energy options for consumers.

Expanding our renewable fuel offerings

In August 2022, we launched [Petro-Canada EcoDiesel™](#) in British Columbia to demonstrate our commitment to helping Canadian businesses as they strive to reduce their carbon footprint. Petro-Canada EcoDiesel™ is produced from hydrotreated renewable diesel, made from 100% non-consumable food wastes such as animal fats and vegetable oils. It avoids up to 84% of the GHG emissions of conventional diesel, is cleaner-burning and, as a drop-in fuel, it can be seamlessly substituted for conventional diesel. We plan to launch Petro-Canada EcoDiesel™ in Ontario in 2023.

Additionally, as a member of the Canadian Council for Sustainable Aviation Fuels, Suncor is working with domestic and international airlines to explore the market for SAF as part of our strategy to operate renewable fuel production facilities in North America.

Testing hydrogen for transport

As part of the Alberta Zero Emissions Truck Electrification Collaboration ([AZETEC](#)) project, we are evaluating opportunities to decarbonize heavy-duty transport with hydrogen and assess demand for it as a transportation fuel. AZETEC is a multi-party effort to design, manufacture and test long-range hydrogen-powered trucks operating between Calgary and Edmonton. This 18-month

Work with others to reduce emissions

pilot with our partners is a first step to potentially economically viable commercial hydrogen for transport. Suncor is developing two hydrogen refuelling stations as part of this project. We are also involved in the Alberta Zero Emission Hydrogen Transit ([AZEHT](#)) project, which will test two hydrogen fuel-cell electric buses in road trials within the City of Edmonton and Strathcona County. Suncor will provide the hydrogen fuel from the AZETEC project.

Collaborate on technology and innovation

Expanding low-carbon energy requires technological advancement and significant collaboration. We are founding and/or long-standing partners in several organizations, working collectively to advance knowledge-sharing and innovation in our industry and across society.

- [Avatar Innovations](#) – focused on energy-sector leadership, innovation, entrepreneurship and capital to support new energies; supported by Suncor since 2021
- [Canadian Council for Sustainable Aviation Fuels](#) – brings together industry and government stakeholders to accelerate the commercial deployment of low-carbon SAF in Canada; Suncor is a member
- [Clean Resource Innovation Network](#) – an industry-led network that aims to make Canada a global leader in producing low-carbon hydrocarbons from source to end use through advanced technologies; supported by Suncor through leadership and subject matter experts in technology working groups
- [Energy Futures Lab](#) – a multi-stakeholder forum focused on solving complex system-level challenges by applying social innovation to identify and advance solutions that will create the future energy system; Suncor is a founding partner and funder
- [Evok Innovations](#) – a technology fund focused on enabling entrepreneurs to commercialize clean technologies and market them globally, funded by Suncor and Cenovus Energy at \$100 million; in 2022 Evok raised a new US\$300 million fund from additional investors to target a suite of technologies that include CCS, clean fuels, electrification, industrial decarbonization and critical minerals
- [Pathways Alliance](#) – the unprecedented and increasingly globally recognized alliance of the six major oil sands companies representing 95% of oil sands production, with the objective of achieving net-zero emissions from production by 2050.

Engage with stakeholders

Stakeholder engagement provides the opportunity to share Suncor's progress and challenges and incorporate external perspectives into our strategies and plans. Over the past year, Suncor engaged in multiple climate-focused meetings, workshops and conferences with shareholders, regulators, standard-setting bodies and other organizations, including Climate Action 100+ and Ceres.

A strong history of engagement with Ceres

Ceres provides a forum for investors, companies and non-profit organizations to engage on sustainability topics. We have worked with Ceres on several roundtable forums over the past 15 years, which provide the opportunity to obtain feedback on our strategies and plans from diverse groups. In the fall of 2022 Suncor engaged Ceres to facilitate a panel to gather input on our strategy and climate objectives, scope 3 emissions and approach to a just transition. The panel included investors, financial institutions, environmental non-governmental organizations, Indigenous communities, and Suncor executives and senior management. Participants were generally positive regarding Suncor's approach and recommended we disclose more details on our GHG emission reduction timelines and climate-related investments. Participants also encouraged more partnerships and collaboration with Indigenous communities, technology developers and others. While our sustainability leadership was recognized, some highlighted that Suncor could carve out a more definitive role in the energy transition with broad consideration of stakeholders, communities, employees, our upstream supply chain and other interests. The panel provided several recommendations that will be valuable inputs for how we continue to translate objectives into actions over the years ahead. Our past engagements with Ceres and other stakeholders led to recommendations for us to tie executive compensation to climate objectives, which we implemented – a strong example of translating objectives into actions.

Work with our supply chain

We have undertaken a process to identify risks and opportunities within our supply chain and screen suppliers based on standardized sustainability criteria. This involves reviewing critical suppliers' sustainability reports, codes of conduct and climate disclosures, and integrating climate-related criteria into vendor audits. We also track supply chain risks in our Enterprise Risk Management program to identify climate-related risks and opportunities. Through proactive engagement from business and supply chain sponsors, we expect to advance specific environmental objectives with our core suppliers in the coming years.



Governance and risk management

- > Climate governance
- > Climate risk management

We have long recognized carbon as a principal risk to our business. Our governance firmly embeds climate-related risks and opportunities into our business planning and decision-making, enabling effective stewardship and execution of our strategy and objectives.

Climate governance



Climate risks and opportunities are embedded throughout the structure and processes of management and the board of directors, including in the areas of strategy development, business planning, project execution, risk oversight, executive compensation, skills development and external engagement. This year, we further strengthened the link between corporate greenhouse gas (GHG) objectives and senior management compensation and provided additional disclosure on our government advocacy principles and activities. More information about our governance structure and processes may be found in our [Annual Management Proxy Circular](#).

Management's role

With respect to Suncor's strategic objectives, the role of the executive leadership team is to set and implement corporate strategies, and effectively navigate risks and opportunities. The team establishes operational objectives, sets financial direction to support strategies, and integrates climate change and other sustainability considerations into business planning and decision-making. As a member of the board, Suncor's president and Chief Executive Officer (CEO) is a key link between the board and management. The CEO keeps the board fully informed of the company's progress toward achieving its climate objectives and the board evaluates the performance of the CEO and management in relation to the execution of the objectives.

Climate governance

In late 2022, Suncor integrated the responsibilities of the Chief Climate Officer under the Chief Sustainability Officer (CSO). The CSO stewards Suncor's work to support excellence in environmental and social performance, including in the areas of climate change, external relationships and engagement, and reporting on sustainability performance. The CSO integrates climate and sustainability matters

into all areas of Suncor's business and plays a critical role in developing and championing Suncor's climate-related strategies and positions. The role serves as a key executive link to the Environment, Health, Safety and Sustainable Development (EHS&SD) Committee of the board, which oversees carbon risk.

Suncor's climate governance

Board of Directors

Environment, Health, Safety and Sustainable Development Committee

Governance Committee

Human Resources and Compensation Committee

Audit Committee

- Oversee Suncor's climate-strategy-related business plans, including capital allocation
- Ensure systems are in place to effectively identify, manage and monitor climate risk and undertake annual enterprise risk review
- Perform annual review of the executive compensation structure including Climate Performance Share Units
- Review climate disclosure and results of internal audits

Executive Leadership Team*

Chief Executive Officer

Chief Sustainability Officer

Chief Financial Officer

- Establish and implement corporate climate strategy and operational objectives
- Evaluate and prioritize climate risk
- Approve annual Planning Price Assumptions scenarios
- Provide financial direction on capital decisions including decarbonization plans
- Review annual climate disclosure
- Endorse industry association memberships

Leadership committees/forums

Asset Development & Execution Council

Policy & Regulatory Forum

Technology & Innovation Forum

Climate & Energy Transition Network

- Prioritize, sequence and guide climate-related decisions, capital and strategic investments
- Manage policy and regulatory issues and develop action plans
- Drive alignment of technology development workstreams across the enterprise
- Inform and enhance climate-related disclosure

* Within the executive leadership team, the Senior Vice President Exploration & Production/In Situ is accountable for the emissions reduction portfolio across the entire organization.

Climate governance

Board oversight

Strategy and business planning

A key duty of the board is to review and monitor Suncor's strategy and objectives, the plans for achieving them and whether they are successfully implemented. Suncor's management and the board have annual meetings dedicated exclusively to reviewing Suncor's strategy, annual business plans and capital budget. The EHS&SD Committee reviews and makes recommendations to the board regarding Suncor's sustainability-related strategic objectives and progress. In 2021 Suncor and the board undertook a review and update of Suncor's business strategy which, in part, resulted in our objective to be a net-zero company by 2050.

Risk management

The board monitors risks to Suncor's business, including Suncor's Enterprise Risk Management (ERM) program. It ensures there are systems in place to effectively identify, manage and monitor the principal risks of Suncor's business and to mitigate their impact. A principal risk is an exposure that has the potential to materially impact Suncor's ability to meet its objectives. Suncor identified carbon as a principal risk to its business in 2016. Carbon risk is integrated into many aspects of our business planning and decision-making and requires the full board to review external trends, scenarios and Suncor's risk management plans, at least annually. The EHS&SD Committee reviews carbon risk quarterly. The Audit Committee reviews the governance of Suncor's ERM program and ensures each principal risk has an executive sponsor and is mapped to a board committee or the full board, as appropriate, for oversight. Suncor's CSO is currently the executive sponsor of carbon risk, which is mapped to the full board and the EHS&SD Committee for oversight and reviewed annually.

Executive compensation

Executive compensation plans are a key component of board oversight and closely tied to our strategy execution and business performance. Starting in 2022, we strengthened the link between the compensation of our executives and Suncor's sustainability performance. We introduced a component of executive compensation that will be directly determined by progress relative to our climate objectives, in the form of performance share units (PSUs) tied to the long-term incentive plan for the vice president level and up. Vesting of the initial award will be based on progress from 2022 through 2024 toward our 2030 commitment to reduce annual GHG emissions by 10 megatonnes (Mt) across our value chain. Climate PSU metrics focus on the health of the GHG portfolio, the allocation of capital and the achievement of emission reductions. In 2023, we strengthened the program by enhancing the weighting of the emission reduction component.

Skills and experience

The board recognizes the importance of having the right skills and experience in relation to Suncor's business, including emerging risks and issues, changes to the legal, regulatory or industry environment, and opportunities presented by new technologies. The Governance Committee maintains and updates an inventory of the capabilities, competencies and skills of current board members, and of the board as a whole, to identify those attributes that best fit with the board's priorities and support Suncor's business strategy. Currently, 90% of board members have experience in environment, health and safety, including climate risk management. The board's Director Continuing Education Policy underscores the value of learning and education in continued board effectiveness. During 2022, the board, its committees and individual directors participated in presentations and received educational information on a variety of topics, including energy transition and oil market trends, climate risk and ESG reporting.

External engagement

The board is mandated to ensure that systems are in place for communicating with Suncor's shareholders and other stakeholders, which includes reviewing annual climate disclosure. We recognize the importance of external communication and engagement and regularly participate in climate-related engagements with shareholders, organizations that represent or advise shareholders and other stakeholders. The board also recognizes its role in shareholder engagement on matters of governance and is guided by the Shareholder Communication and Engagement Policy.



Climate risk management

Suncor proactively manages an ERM program led by the VP Enterprise Risk and Audit to integrate climate-related risks inherent to our assets, activities and operations. Our integrated approach results in enterprise-wide, collaborative risk mitigation and supports effective and efficient decision-making by management and the board. An enterprise risk matrix supports the assessment and prioritization of risks and opportunities using a common measure of likelihood and consequence, along financial, regulatory, reputational, safety and environmental dimensions.

Other risk management processes and practices at Suncor include:

- a policy and regulatory forum to ensure enterprise alignment and an integrated approach to managing climate policy and regulatory changes
- an annual carbon price outlook that incorporates current regulations and expected cost and benefit forecasts into the economic evaluation of projects in our corporate business scenarios
- annual updates of corporate and climate scenarios that are used to test the resilience of our business strategy
- an asset development and execution model that includes a review of climate-related risks and opportunities early in the gated process and before commitment of significant resources
- deep integration of climate risks and opportunities across Suncor's business, including dedicated organizational structures to advance emission reductions
- facility-level GHG emission forecasts to identify risks and optimize business planning.

Transition risk

We consider key transition risks such as new policies and regulations, evolving markets and pricing, and changes in consumer preferences using climate scenarios to assess the resilience of our business and carbon policy and pricing scenarios to support business plans and capital allocation.

Policy and regulatory risk

We continuously monitor the policy and regulatory environment to identify emerging risks and opportunities. Our policy and regulatory forum includes an issues management process to drive enterprise alignment and a disciplined approach to evaluating opportunities and mitigating policy and regulatory risks. The forum consists of a set of cross-functional networks, each focused on specific themes, including climate and energy transition. We are proactive about emerging risks and leverage the forum and networks to prioritize, sequence and steer work across the company.

We operate in many jurisdictions across North America that regulate, or have proposed to regulate, GHG emissions. Our approach is to engage constructively with governments and relevant stakeholders and advocate for effective and efficient policies to address climate

change. Our advocacy recognizes support for the goals of the Paris Agreement and includes a blend of regulations and incentives for emission reductions and removals.

Engaging with regulators

Suncor regularly engages with government officials at the local, provincial, state and federal level to provide information on matters of importance to our business and to ensure government policy decisions consider our perspectives. We are committed to conducting engagement activities in an ethical and transparent manner, whether directly or through trade association memberships, and adhering to all related laws and regulations.

The aim of our climate advocacy activities is to help Canada meet its Paris Agreement commitments through a collaborative approach between industry and all levels of government, and to advocate for the development of a robust regulatory and fiscal framework that ensures regulations are achievable and affordable for consumers. During 2022, our engagement broadly focused on providing input into the development and application of the Clean Electricity and Clean Fuel regulations, the federal oil and gas emissions cap, including the 2030 Emissions Reduction Plan, and seeking clarity and certainty on the CCUS Investment Tax Credit.

More information about climate-related policies, risks and their regulatory impacts can be found in [Suncor's 2022 Annual Information Form](#).

Carbon policy

Suncor incorporates assumptions about existing and proposed new regulations into its corporate scenarios and business plans to evaluate financial risks and opportunities. These assumptions inform development, acquisition and divestment activities, and capital and strategic planning decisions. Each year as part of our business planning process we use three corporate scenarios to develop price assumptions for a variety of economic variables, including carbon. Carbon price assumptions and forecasts are based on current and emerging regulations and are applied to our assets based on anticipated impacts, using a bottom-up approach.

The Canadian government has enacted and proposed several climate-centred policies. An economy-wide carbon price backstop on industries and consumers is in effect and projected to reach \$170 per tonne of CO₂ by 2030. It is triggered in any province that chooses to adopt it or that does not have an equivalent pricing policy. New clean fuel regulations, aimed at reducing the carbon intensity of gasoline and diesel, will come into effect in July 2023. Other policies, including an electricity standard, oil and gas emissions cap, and methane regulations are proposed. Canada's Emissions Reduction Plan (ERP), released in April 2022, included a projection of a 42% reduction in oil and gas GHG emissions by 2030, compared to 2019 levels. However, no target or methodology

Climate risk management

for an emission cap has been released and Suncor continues to consult with the federal government to align the ambitious net-zero plans announced by Suncor and the Pathways Alliance with the projection outlined in the proposed ERP. We are engaging with the federal government on climate policies holistically, including on key issues of policy streamlining, the right balance of regulations and incentives, and appropriate compliance mechanisms to achieve climate objectives economically and competitively.

All of Suncor's upstream emissions and approximately 80% of our refinery emissions are subject to carbon pricing,⁸ which sends a strong signal to manage emissions across our business. In alignment with federal backstop legislation, most of our Canadian facilities were subject to a carbon price of \$50 per tonne of CO₂ in 2022, which increased to \$65/tonne in 2023. Approximately 90% of our GHG emissions occur in Alberta, which has regulated industrial GHG emissions since 2007. In December 2022, Alberta amended its Technology Innovation and Emissions Reduction (TIER) Regulation to maintain federal carbon price equivalency from 2023 to 2030. Other amendments include a tightening of the reduction target on industrial facilities from 1% to 2% per year for 2023 to 2028 and, for oil sands facilities, to 4% for 2029 and 2030⁹. Other notable changes to TIER include greater compliance flexibility, including the establishment of carbon sequestration credits¹⁰ as new compliance instruments, and increased limits on credit usage to meet compliance obligations.

Updated TIER stringency combined with mandated federal carbon pricing, 2023-2030

Year	Increase in annual stringency (In addition to existing 2022 stringency)	Federally mandated carbon price (\$/tonne CO ₂ equivalent)
2023	2%	\$65
2024	4%	\$80
2025	6%	\$95
2026	8%	\$110
2027	10%	\$125
2028	12%	\$140
2029	16%*	\$155
2030	20%*	\$170

* For oil sands assets only (mines, in situ and upgraders). A consistent 2% per year stringency applies to Alberta's refineries and most other industrial facilities.

⁸ The Commerce City refinery is currently not regulated, but Colorado is expected to pass legislation in late 2023.

⁹ This reduction target applies to industrial facilities under the facility-specific benchmark methodology, whereby a facility was initially required to reduce its emissions intensity by 10% relative to a historical baseline, by 2020. The reduction target has since increased by 1% annually and increases by 2% annually as of 2023.

¹⁰ This new credit type enables a facility to also apply for carbon capture and sequestration crediting under the Clean Fuels Regulation.

¹¹ Costs assume sanctioning of the Base Plant Cogeneration project by mid-decade. For consistency and comparability with prior years' compliance cost disclosures, we used net production (final products sold to market) in these calculations.

¹² Low Carbon is substantially based on the IHS Markit (now part of S&P Global Commodity Insights) Green Rules 2022 scenario.

¹³ The Suncor scenarios (Low Carbon, Free Markets and Discord) have been independently developed and named by Suncor. Data within the Suncor scenarios references the Green Rules, Inflections and Discord scenarios published by IHS Markit (now part of S&P Global Commodity Insights) in 2022.

Carbon price impacts

We apply carbon prices to our scope 1 and 2 GHG emissions on a working-interest basis for our upstream and downstream business and develop an estimated cost per barrel to illustrate the relative impact of carbon policies. The estimated 10-year (2023-2032), before-tax, average cost of carbon is \$1.70 per barrel for our upstream net production and \$0.48 per barrel for our downstream salable yield.¹¹ Our compliance costs reflect regulatory impacts and actions we've taken to reduce emissions, such as our low-carbon investments. Emission credits from cogeneration power exports, representing a regulatory compliance benefit, are included in the upstream cost estimate, while the benefits from renewable power projects are not reflected in the upstream or downstream estimate. Provincial regulations like Alberta's TIER are designed to reward low-carbon investments and allow us to manage compliance costs in a globally competitive market. This is a consistent approach in many global carbon-pricing regimes to protect trade-exposed industries in markets where they cannot pass along climate compliance costs to consumers without losing market share. This approach seeks to mitigate investment loss and minimize carbon leakage.

Climate scenarios

We use three scenarios to 2050 to test and assess the resilience of our business strategy against inherent uncertainty. All scenarios are developed using distinct, challenging, relevant and plausible world trajectories that illustrate a wide range of outcomes. The scenarios are updated annually and use variables adjusted in a consistent manner, including demographic, economic, environmental, geopolitical, legal, social, cultural and technological factors. We have decided to retire our 2°C scenario because our Low Carbon scenario¹² now implies a potential pathway to an average global temperature rise of approximately 1.8°C above pre-industrial levels by 2100, which is more aggressive than 2°C.

The scenarios are used by the executive leadership team and the board to assess our business strategy and identify alternate strategies. They are also used by internal teams to evaluate projects and opportunities. The scenarios are not used as forecasts or predictions. This process continues to be a useful tool for stress-testing our business on several key dimensions, including climate risk.

The three scenarios are called Low Carbon, Free Markets and Discord¹³ (previously Autonomy, Rivalry and Discord). Founded on a view supported by organizations like the International Energy Agency and the U.S. Energy Information Administration, each scenario outlines varying levels of oil required for the decades ahead as the

Climate risk management

Low Carbon scenario

1.8°C by 2100

- Pressure from stakeholders continues to push companies and governments toward faster action on climate measures.
- Countries, organizations and individuals have a high degree of control over their energy needs, rather than relying on others.
- Greater international co-operation and shifting consumer preferences ensure significant progress on mitigating risks of climate change.
- The massive changes to the global energy system to transition to a low-carbon world come at enormous cost, where people, companies, infrastructure and whole industries are made redundant, with significant investments required to replace the old and grow the new.
- Implies a potential emissions pathway to an average global temperature rise above pre-industrial levels of approximately 1.8°C by 2100.
- Consumers are willing to pay the additional cost burden of decarbonizing at a faster pace.
- The developed world agrees to pay for the developing world to deploy new and more advanced energy systems.

Indicative signposts that point to Low Carbon

In Canada, the federal government has released several climate-related policies and regulations (e.g., clean fuel regulations, oil sands emissions cap, net-zero electricity grid by 2035, etc.) and the provinces continue to adjust their own policies and regulations to align more closely with the more stringent federal policies (e.g., Alberta TIER).

Energy market impacts

- Fossil fuel demand declines steadily over time, while energy demand stays largely flat.
- A strong focus on developing non-fossil energy sources as energy supply becomes less carbon intensive.
- Renewable power generation becomes the largest source of energy by 2050 to meet growing demand.
- Significant growth in biofuels and low-carbon hydrogen.

Free Markets scenario

2.4°C by 2100

- The market decides where, how and when to allocate resources to lower emissions.
- GHG reduction occurs at a lower cost and a slower pace compared to the Low Carbon scenario.
- Energy security and energy transition compete.
- There is periodic wavering on climate commitments as other priorities often challenge the resolve and capabilities of governments and companies to address climate change.
- Implies a potential emissions pathway to an average global temperature rise above pre-industrial levels of approximately 2.4°C by 2100.

Indicative signposts that point to Free Markets

- Growing pressure to reduce absolute emissions and enhanced public discourse drive climate policy forward; however, co-ordinated global climate change action remains stalled.
- In the near term, consumer preference, vehicle costs and vehicle availability drive vehicle fleet makeup, more than government policy.

Energy market impacts

- Energy demand increases, with both fossil fuels and renewable energy taking market share from coal.
- Gasoline demand starts to drop, while diesel demand stays largely flat.
- Rapid growth is seen in biofuels, while demand for low-carbon hydrogen increases modestly.

Climate risk management

Discord scenario

2.9°C by 2100

- Energy security outweighs decarbonization, leading countries to rely on GHG-intensive fuels for longer.
- Decarbonization efforts continue in some key sectors and countries, but the scale and pace are insufficient to significantly alter global emissions growth.
- The global supply chain breaks down, raising the cost of living for the emerging middle class.
- GHG emissions eventually start to decline at a very gradual rate. As a result, climate concerns eventually turn more to adaptation than to mitigation.
- Implies a potential emissions pathway to an average global temperature rise above pre-industrial levels of approximately 2.9°C by 2100.

Indicative signposts that point to Discord

- Global economy stutters from high inflation, with an increasing chance of recession underpinning a fragile global economic environment.
- There is a heightened focus on national self-interest, protectionism and deglobalization.
- Years of under-investment in fossil fuels lead to a structural undersupply and volatile oil prices.

Energy market impacts

- Oil and gas demand grows steadily, as policy and market-based measures to decarbonize are constrained by weak governments and commercial uncertainty.
- Supply and demand are regularly off-balance, as investments in energy remain reactionary.
- Energy mix in 2050 is largely static compared to 2021, with renewable energy growth replacing coal.
- Demand for refined products remains largely stable until the end of this decade.
- Electric vehicles continue to gain market share, although at a slower rate compared to Free Markets and Low Carbon.

world transitions to meet climate ambitions, and has an implied crude oil price range and climate change regulatory impact. Two of the three scenarios – Low Carbon and Free Markets – reflect the current global aspiration toward reducing carbon emissions. The three scenarios are differentiated by the overall context, pace and scale of reductions. All our climate scenarios confirm the need to continually lower costs and carbon emissions throughout our business.

Alongside our scenarios, we annually update signposts that identify critical shifts in the external context, helping us track the pace and direction of change, at a global and Canadian level. The current signposts we monitor include the global energy demand and supply mix, political and economic indicators, climate data and the evolution of transportation.

Physical risk

We assess specific risks to our physical assets, including the risk of acute or chronic extreme weather events, which are possible in the areas where we operate. We manage these risks through facility design, operational procedures, third party reviews and insurance for damage to, or loss of, assets.

Acute and chronic risk

Physical risks associated with climate change may manifest as both acute (or event-based) and chronic (or gradual). They may occur over different geographic scales and time horizons, sometimes exceeding normal business planning and investment time frames. Suncor operates in regions of Canada and internationally that are characterized by extremes in weather and weather-related events, including extremes in temperatures, as well as wildfires and flood risks. Our consideration of acute risk is focused on the potential range of intensity and frequency of these types of events and potential long-term conditions that may impact our physical infrastructure or the behaviour of the natural environments in which we operate. Many of our facilities routinely operate in an annual temperature range of -40°C to +40°C and are built to mitigate extreme weather events.

Chronic risks associated with climate change are evident in conditions such as coastal erosion from sea level change, shifting ranges of plant and animal species and long-term changes in the water flow of glacier-fed streams. Suncor's initial assessment of chronic risks shows that, over the long term, there may be some

Climate risk management

effects on our operations in terms of the base flow of water bodies that feed into our operations or geographic shifts in biomes and habitats that may affect the way in which we reclaim our operations, which require further risk assessment and analysis.

Given the location of Suncor's assets and the range of conditions for which they were designed, Suncor does not expect to incur chronic financial costs due to climate change beyond those

already incorporated into the design of resilient infrastructure. Our business planning process includes the potential impacts of a broad range of climate conditions and effects on our facilities. Examples of plans being considered include water storage and modified water management in the Wood Buffalo region to mitigate extended periods of drought.

Weathering extreme events

Our management systems and practices ensure winterization programs are in place for critical areas before entering the winter season. We actively monitor and steward our facility winterization status and progress across our business. When we anticipate extreme cold temperatures, we take additional measures and contingencies to protect our people and equipment. In our northern Alberta oil sands operations, we regularly experience weather extremes and the overall resilience of our operations demonstrates the success of our winterization systems and practices. However, in December 2022, the Commerce City refinery, owned and operated by

our US subsidiary Suncor Energy (U.S.A) Inc., experienced equipment damage due to extreme and record-setting weather. In line with our operational excellence and safe operating practice, the entire facility was shut down and put into safe mode to allow for a thorough inspection and repair of the damaged equipment. The refinery was subsequently brought back to full operations by April 2023. This event gave us valuable lessons about ways to increase the resilience of the Commerce City refinery to similar future events, including adopting strategies we use at our northern Canadian operations.



Climate risk management

Physical risks, impacts and mitigations

	Type	Impact to Suncor	Mitigations in place
Event-related (acute)	Wildfire	Facilities located in and near forests and grasslands are subject to shutdowns and business interruption due to wildfires.	<ul style="list-style-type: none"> Co-ordinating between Suncor's fire/emergency services and local fire protection services, and the use of firebreaks in areas with higher risk of wildfire; managing facilities in line with FireSmart guidance Developing additional water sources and recycling plans for water-dependent facilities, such as oil sands mining and in situ Implementing protocols for working in severe weather Considering physical risks as part of infrastructure design and facility management Monitoring storm systems through a continuous weather tracking service Using a continuous monitoring system to track icebergs and regular flyovers to map movement; if an iceberg poses a threat, working to either alter its direction or enacting an emergency response to move assets to safer water Maintaining robust emergency response and business continuity plans to help staff prepare and manage weather events Continuing to improve water recycling rates at our facilities and reducing overall water use Preserving and promoting biodiversity in all areas where we work by using land use and management planning processes to identify where disturbances can be avoided throughout our projects
	Flood/Drought	High-water events may cause overland flooding, shutting down Suncor activities at the affected locations. Short-term reductions in water availability can impact the amount of water available for industrial operations.	
	Extreme temperature	Extreme heat can reduce operating efficiencies of cooling-dependent industrial operations and can affect worker productivity as more frequent cooling breaks are required. Extreme cold can reduce operating efficiencies due to risks such as freezing equipment that may cause delays in operations. Extreme cold also affects workers who require additional breaks to ensure their safety from the elements.	
	Storms/ Icebergs	Short-term events of storms or icebergs could lead to the temporary closure of facilities or relocation of offshore facilities.	
Progressive (chronic)	Coastal erosion	Suncor's coastal facilities are limited, with minimal use of piers and docks to support our offshore operations.	<ul style="list-style-type: none"> Maintaining robust emergency response and business continuity plans to help staff prepare and manage weather events Continuing to improve water recycling rates at our facilities and reducing overall water use Preserving and promoting biodiversity in all areas where we work by using land use and management planning processes to identify where disturbances can be avoided throughout our projects
	Baseflow change in streams	While short-term droughts can be suitably managed, long-term changes in stream flows from glacier-fed streams could alter long-term availability of large quantities of water.	
	Geographic shift in habitats	The obligation to restore habitats to what was previously there may conflict with shifts in new geographic ranges of species or suitable habitats.	
	Ambient temperature	Prolonged periods of extreme cold could force facilities into extended shutdowns to ensure worker safety and prevent undue stress on equipment. Prolonged periods of extreme heat may lead to production cuts if an adequate supply of cooling water is not available.	



Performance and metrics

- > Relative performance of energy products
- > GHG emissions



Guided by our strategy, we are focused on reducing emissions by optimizing assets and investing in new technologies. Our objective is to reach net zero scope 1 and 2 greenhouse gas (GHG) emissions by 2050 and achieve 10 megatonnes (Mt) of annual emission reductions by 2030, in our base business and across our value chain (including scope 1, 2 and 3). Our focus is, first, on reducing base business emissions with fuel switching, energy efficiency and CCS, and, second, growing profitable businesses in low-carbon

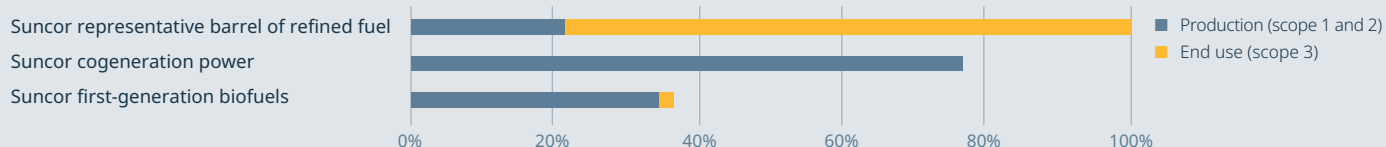
power, fuels and hydrogen. Since many technologies we are implementing will deliver step-change improvements, our 2030 emission reduction trajectory is not linear. We estimate about half of our 10 Mt objective will be met by direct emission reductions in our operations and the rest will be met elsewhere in our value chain, including through the sale of low-carbon products.

Relative performance of energy products

To illustrate the relative carbon performance of various Suncor energy products, we estimated the carbon intensity of our 2022 average refined barrel, low-carbon cogeneration power sales, and renewable fuel production. Our estimates consider Suncor's weighted average direct (scope 1), indirect (scope 2) and "use of sold products" (scope 3 category 11) emissions, which are by far our largest source

of scope 3 emissions, as a function of total output of energy. As shown below, the scope 3 end-use carbon intensity of cogeneration power sales and renewable fuels is zero; therefore, increasing production and use of these products – as well as low-carbon hydrogen, in the future – will reduce the overall carbon intensity of our products over time and supports our GHG objectives.

Carbon intensity of energy products



GHG emissions¹⁴

We have reported on our GHG emissions for decades, began reporting scope 3 emissions from the “use of sold products” in 2021, and, for the first time, are disclosing our estimated scope 3 emissions from “fuel and energy-related activities” (category 3) and “processing of sold products” (category 10). Direct, or scope 1, emissions result from our operations; indirect, or scope 2, emissions result from the use of purchased energy such as heat and electricity; and scope 3 emissions occur elsewhere in our value chain.

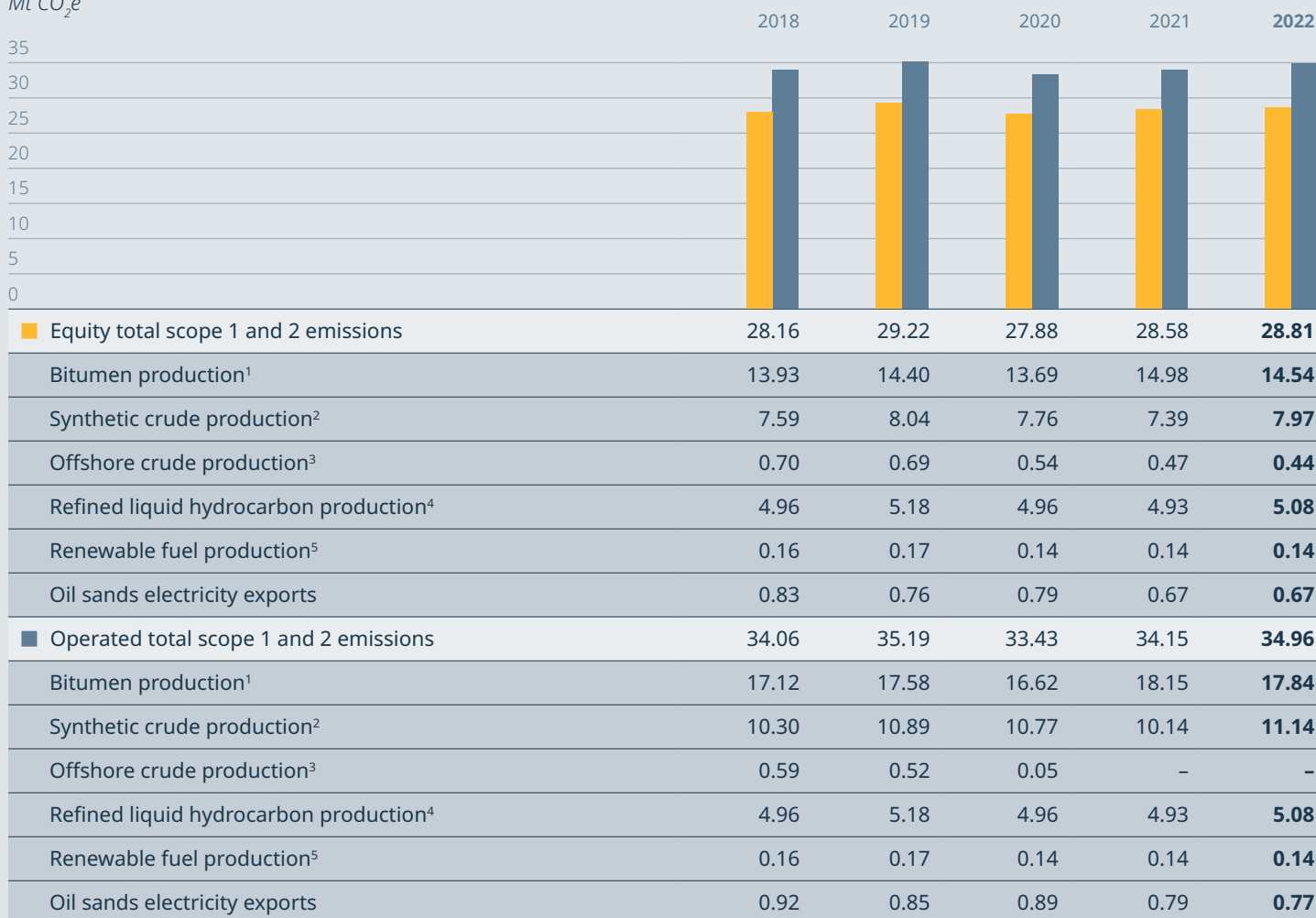
Scope 1 and 2

In 2022, our equity scope 1 and 2 GHG emissions were 28.8 Mt, a 0.8% increase from 2021. Our 2022 operated emissions were 35.0 Mt, a 2.4% increase from 2021. This increase stemmed from

higher production at specific upstream sites. The transition to two-train operations and expansion of the mine at Fort Hills increased its operated GHG emissions by 24%, but lowered its intensity by 26% due to improved reliability and optimization of operations. Operated emissions at Syncrude were 7% higher than 2021 due to delayed maintenance impacting the coker units in the upgrader as well as the processing of ore with higher than normal clay content. Our equity scope 1 and 2 emissions intensity decreased by 2.1% compared to 2021 to 0.3 tonnes of carbon dioxide equivalent per cubic metre (tCO₂e/m³) of liquid hydrocarbon product. On an operated basis, GHG intensity decreased by 2.9% to 0.3 tCO₂e/m³ liquid hydrocarbon product. This decrease was due to higher production at Fort Hills, Syncrude and the Commerce City refinery.

Absolute scope 1 and 2 GHG emissions

Mt CO₂e



1 Bitumen production from Base Plant, Syncrude, Fort Hills, Firebag and Mackay River.

2 Synthetic crude production from Base Plant and Syncrude.

3 Offshore crude production from E&P Canada (including Terra Nova) and E&P International.

4 Refined liquid hydrocarbon production from refineries and logistics.

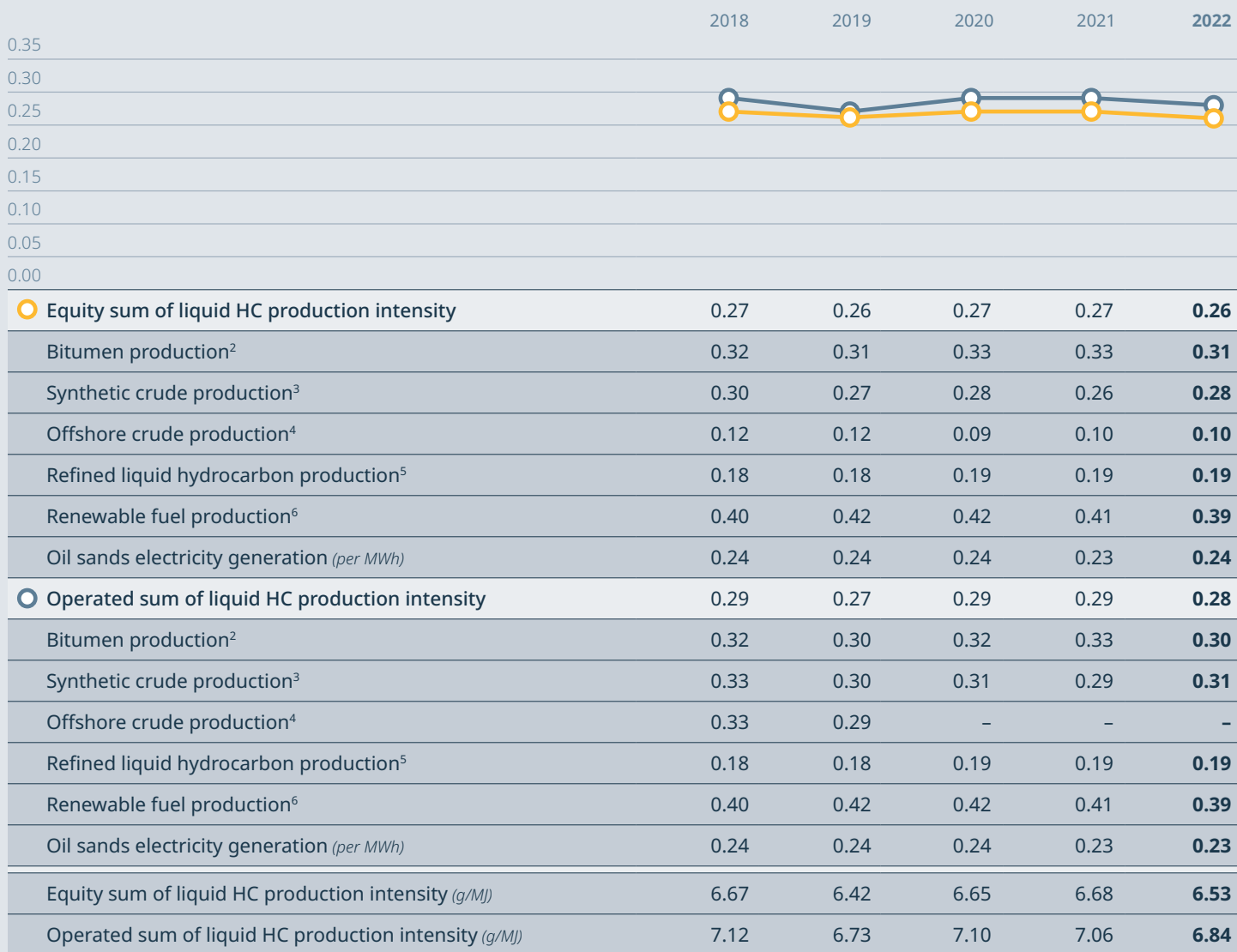
5 Renewable fuel production from St. Clair ethanol plant.

14 As explained in the Data Restatements section, this year we updated our reporting methodology to define total production as the sum of all liquid hydrocarbons produced from our business activities. As a result, corporate GHG intensity values are lower than previously reported, but absolute emissions remain the same. In addition, this report shows our performance by product rather than facility and business segment, which also differs from previous reports, although facility and business segment results may be found in our [2023 Sustainability Performance Data](#).

GHG emissions

Scope 1 and 2 GHG intensity¹

t CO₂e/m³ liquid hydrocarbon (HC)



Suncor uses generally accepted industry energy densities to convert m³ to MJ

¹ This year we revised our GHG intensity metric to tCO₂e/m³ to report in units that require the fewest number of assumptions. To enable comparisons to previous years' data, we are also providing intensity in g/MJ at the bottom of the intensity table.

² Bitumen production from Base Plant, Syncrude, Fort Hills, Firebag and Mackay River.

³ Synthetic crude production from Base Plant and Syncrude.

⁴ Offshore crude production from E&P Canada (including Terra Nova) and E&P International.

⁵ Refined liquid hydrocarbon production from refineries and logistics.

⁶ Renewable fuel production from St. Clair ethanol plant. Renewable fuels may have a relatively high scope 1 and 2 GHG intensity due to the energy required to convert biomass into liquid fuels compatible with vehicle engines. The GHG benefit of renewable fuels is that the carbon emitted during their combustion is sequestered from the atmosphere during their growth phase.

GHG emissions

Regulatory emission credits

In 2022 we began to disclose the volume of GHG emission credits we retired¹⁵ to meet compliance obligations, to provide transparency around the GHG benefits of our actions. Regulations allow us to use various mechanisms for compliance, including credits, which have direct emission benefits. Suncor's trading and optimization team uses all of these mechanisms to achieve compliance at the lowest cost. In 2022 we retired approximately 0.7 Mt¹⁶ of GHG emission credits, reducing our equity emissions from 28.8 Mt to 28.1 Mt. These credits were generated from our operations that performed better than regulatory benchmarks, such as cogeneration and wind, and were supplemented with credits purchased from applicable exchanges. The credits represent real, verified emission reductions to the environment that, once retired, lock in these benefits. Over time, our emissions will be reduced directly and through the generation of credits that can offset our emissions and also be retired for compliance purposes.

Scope 3

We support the disclosure of material scope 3 emissions to better understand the sources of emissions along the energy value chain and where we can have the greatest impact on our journey toward more widespread decarbonization. Scope 3 emissions result from production and consumption activities outside of our operations and include 15 categories, as defined by the GHG Protocol.¹⁷ GHG emissions from the "use of sold products" (category 11) are by far the most material scope 3 category for Suncor, which is consistent with other integrated energy producers. Analysis has shown that 70% to 80% of GHG emissions from the life cycle of fossil fuel products comes from their combustion. Due to the integrated nature of Suncor's business, "use of sold products" emissions can be calculated at various stages of production. The International Petroleum Industry Environmental Conservation Association (IPIECA) provides guidance on methodologies, considerations and reporting elements that Suncor has incorporated in calculating these emissions. Due to the uncertainty of estimating "use of sold product" emissions and to remain transparent, we are providing these emissions using three different methodologies.

For the first time, we are disclosing estimated scope 3 emissions from "fuel and energy-related activities" (category 3) and "processing of sold products" (category 10). "Fuel and energy related activities" refers to emissions from the extraction, production and transportation of energy we purchase and use. For this disclosure, our emissions are attributed only to natural

gas, which is, by far, the most used fuel across Suncor's operations. "Processing of sold products" refers to emissions from the processing of sold intermediate products that are refined into final products at non-Suncor refineries. There is no established way of calculating these emissions and they are difficult to compare across companies. We are providing these as initial estimates based on internal methods, knowing that they may evolve as we learn more, update our approach, and align our methodologies with new guidance or industry expectations. Below we outline the approach we've taken and factors to consider when assessing the data.

While most of our "purchased goods and services" (category 1) emissions are challenging to estimate, the emissions from our imported purchased hydrogen for the Edmonton and Sarnia refineries are well understood. In 2022, these hydrogen purchases generated 1.5 Mt of CO₂e. There is an opportunity to partner with our suppliers to reduce the scope 3 emissions associated with hydrogen purchases.

Opportunities in our value chain

While we work to reduce our own GHG emissions, we will work with suppliers to help reduce their GHG emissions and support our customers looking for low-carbon energy choices. Suncor is a major consumer of energy, material goods and contracted services, and the downstream supply chain for Suncor's products is geographically extensive. The first step toward broader management of GHG emissions across our value chain is to measure and report on emissions, collecting quantitative and qualitative data across all scope 3 categories and focusing on the most material ones.

Many areas of our business provide opportunities to encourage and support system-wide carbon reductions. The opportunity to influence these emissions is driven by data availability and our ability to take mitigative actions, which limits us in many cases. The "use of sold products" is the most material category of scope 3 emissions for Suncor and we are dedicating resources to reduce consumer emissions by enhancing our low-carbon product offerings (e.g., renewable fuels, electric vehicle charging and hydrogen). We are also making efforts to work with our suppliers, service providers and other business partners to reduce emissions elsewhere in our value chain, including in the areas of "purchased goods and services" (category 1), "capital goods" (category 2), "fuel and energy-related activities" (category 3) and "processing of sold products" (category 10).

¹⁵ A credit is retired when it is registered on a platform and retired by an entity, at which point it can no longer be bought or sold.

¹⁶ Credit retirements each year do not necessarily correspond to compliance requirements. In the case of Quebec's cap and trade system, compliance occurs on a three-year cycle. In 2021 we retired credits for 2018-2020 compliance. The next credit retirement will take place in 2024, for 2021-2023 compliance.

¹⁷ World Resources Institute and World Business Council for Sustainable Development, "Technical Guidance for Calculating Scope 3 Emissions (Version 1.0)," 2013. Available [online](#).

GHG emissions

Estimated scope 3 emissions from “use of sold products” (category 11) based on three methodologies¹⁸

Scope 3 emissions	Methodology	Considerations
126 Mt CO₂e	Upstream production <ul style="list-style-type: none"> Volume of oil extracted from the ground on a working-interest basis Assumes that the crude produced is fully combusted 	<ul style="list-style-type: none"> Represents the total amount of fossil carbon Suncor mined and extracted Overestimates combusted emissions (i.e., not all crude oil is used as combustible fuel) Does not include purchased third-party crude that is sent to Suncor refineries
61 Mt CO₂e	Refining throughput <ul style="list-style-type: none"> Volume of product moved through Suncor refineries; Suncor refines only a portion of its total production of crude oil Assumes that the products produced are fully combusted 	<ul style="list-style-type: none"> Represents the total amount of refined fuel that is produced by Suncor, including from third-party purchased feedstock Excludes combustion emissions from Suncor feedstock sold to other refineries
24 Mt CO₂e	Branded sales <ul style="list-style-type: none"> Volume of refined product sales to retail customers Recognizes sales of renewable fuels, which do not have scope 3 CO₂ emissions, on a life-cycle basis 	<ul style="list-style-type: none"> Represents the emissions from retail customers' purchase of fuel sold by Petro-Canada™ and/or Suncor and assumes all of these emissions are combusted Methodology excludes wholesale volumes Excludes combustion emissions from Suncor feedstock sold to other parties for processing and sales

Estimated scope 3 emissions from “fuel and energy-related activities” (category 3) and “processing of sold products” (category 10)¹⁹

Scope 3 emissions	Methodology	Considerations
Category 3 5-10 Mt	<ul style="list-style-type: none"> Based on the total volume of natural gas used in Suncor's oil sands mining, in situ and refining operations, on a working interest basis (excludes diesel) Estimates the extraction, production and transportation emissions associated with natural gas supplied to our operations 	<ul style="list-style-type: none"> Emissions factors from Environment and Climate Change Canada were used to estimate the carbon intensity of the production and distribution of the natural gas used by Suncor High degree of confidence in methodology, but emission factors are subject to variation, depending on the source
Category 10 5-10 Mt	<ul style="list-style-type: none"> Based on the volume of intermediate products sold by Suncor to other refineries and the regions to which they were sold, on a working interest basis Intermediate products assessed include bitumen, synthetic crude oil and offshore crude oil 	<ul style="list-style-type: none"> Includes refining that takes place within and outside Canada Estimate could vary from year to year, depending on which refiners/regions take Suncor feedstock

¹⁸ Scope 3 estimates for the use of Suncor's energy production are provided in alignment with category 11 of IPIECA's methodology, which contemplates accounting for products at the point of extraction, processing or sales. These scope 3 estimates are not additive, each methodology represents a unique accounting method using different boundary conditions.

¹⁹ A company's scope 3 emissions are a sum of all 15 categories of scope 3. Category 3, category 10 and one of the methodologies from category 11 are additive, in addition to the other categories that represent total scope 3 emissions.

GHG emissions

Characterizing scope 3 emissions in Suncor's business

	GHG Scope 3 category	How it shows up at Suncor	Materiality* Data availability Ability to influence			Where we're at in the journey
			Materiality*	Data availability	Ability to influence	
Upstream in Suncor's value chain	1 Purchased goods & services	Emissions associated with the manufacturing of goods purchased for use at facilities, and from services provided	1-10%	●	●●●	Suncor is currently collecting data to better understand the emissions associated with our suppliers. Through a supplier prequalification process, we gather data and screen potential suppliers based on sustainability-related criteria. Annually, we review our critical suppliers' sustainability reports, codes of conduct and climate disclosures.
	2 Capital goods	Similar to category 1, but these tend to be large-value items that retain capital value after purchase	1-10%	●	●●●	
	3 Fuel & energy-related activities	Emissions from the production of energy purchased and used	1-10%	●●	●●	Suncor is disclosing this category for the first time this year. (see page 36)
	4 Transportation & distribution	Emissions from transportation of goods to a Suncor facility, including pipeline transmission of natural gas and shipping of goods	<1%	●	●	Under materiality threshold for quantification
	5 Waste generated in operations	Life-cycle emissions, including sources such as landfill gas emissions and the disposal of waste products	<1%	●●	●●	Under materiality threshold for quantification
	6 Business travel	Emissions from vehicles used by Suncor personnel for business travel outside Suncor facilities, including airplanes and automobiles	<1%	●●	●●	Under materiality threshold for quantification
	7 Employee commuting	Emissions from the vehicles used by Suncor personnel to travel to sites	<1%	●●●	●●●	Under materiality threshold for quantification. Suncor has been working to create efficiencies for travel to its sites. Additionally, Suncor adopted a hybrid work model in 2021 that allows employees in certain job functions to work from home several days a week.
	8 Leased assets	Emissions from the operations of buildings and facilities that are not owned and directly operated by Suncor	<1%	●●●	●●	Under materiality threshold for quantification
Downstream in Suncor's value chain	9 Transportation & distribution	Emissions from the transportation of Suncor's products to market, where those activities are done by a company other than Suncor	<1%	●	●●	Under materiality threshold for quantification
	10 Processing of sold products	For raw materials and goods, emissions from subsequent processing at non-Suncor refineries into a final product. The majority of emissions from processing our products are included in our scope 1 emissions.	1-10%	●●	●	Suncor is disclosing this category for the first time this year. (see page 36)
	11 Use of sold products	Emissions from the use of the product by the end customer; for Suncor, this is mostly emissions from combustion of fossil fuels	>50%	●●●	●●	Suncor has disclosed this category using three distinct calculation methodologies (see page 36). Suncor is working to help customers find solutions to reduce their emissions, including through electric vehicle charging and low-carbon fuels.
	12 End of life treatment of sold products	For durable goods (e.g., petrochemicals, asphalt), these are the emissions from the end of life of that product	<1%	●	●●	Under materiality threshold for quantification
	13 Leased assets	Emissions from facilities that are owned by Suncor and leased to another tenant or operator	<1%	●●	●	Under materiality threshold for quantification
	14 Franchises	Emissions from facilities owned and operated by a third party, but under a Suncor brand	0	●●	●	Suncor does not currently have scope 3 emissions to report in this category
	15 Investments	Emissions for any operations or facilities that are partly invested in by Suncor. These emissions are reported in the "equity share" portion of Suncor's scope 1 emissions.	0	●●	●	Suncor does not currently have scope 3 emissions to report in this category



* Estimated portion of Suncor's total scope 3 GHG emissions.

Appendix

- > Glossary
- > Performance data
- > Performance data footnotes
- > Advisories



About this report

Suncor has an extensive history of reporting on environmental, social and governance (ESG) performance in its annual Report on Sustainability, Climate Report, Annual Report, Management Proxy Circular, Annual Information Form/Form 40-F, and through submissions to several third-party indices and ESG reporting organizations, including the CDP. Please visit our [CDP](#) climate response on our Sustainability reporting website for more details.

Our 2023 Climate Report is supplemental to our 2023 Report on Sustainability. The report reflects the details of our strategy, provides information on how Suncor assesses climate-related risks and opportunities and outlines our plans to build long-term resilience in a low-carbon economy.

As part of the seventh annual update, we continuously aim to improve our approach to climate-related financial disclosures. We support and align with the Task Force on Climate-related

Financial Disclosures (TCFD) recommendations. Our TCFD concordance table can be found in our 2023 ESG Disclosure Index. We evaluate all appropriate disclosure opportunities to ensure we provide transparent and wide-ranging perspectives on climate change and the energy future while recognizing the challenges of providing forward-looking information within regulatory financial disclosure requirements.

This climate report contains certain forward-looking information and forward-looking statements (collectively referred to herein as “forward-looking statements”) within the meaning of applicable Canadian and U.S. securities laws. Forward-looking statements in this publication include statements regarding Suncor’s greenhouse gas (GHG) and emissions objectives, targets, reductions, investments, technologies and opportunities, including the benefits and costs in relation thereto, as well as future capital allocation plans. Please see our [Legal and privacy webpage](#) for more information regarding forward-looking statements.

Glossary

Term	Definition
Advanced-generation biofuels (or second- and third-generation biofuels)	Fuels produced using feedstocks that do not compete with food, land, water and fertilizer, through processes such as gasification or gas fermentation. The use of non-food sources such as agricultural waste, forestry residue, municipal solid waste and other waste biomass feedstocks results in more sustainable fuels with the potential to significantly reduce GHG emissions.
Biofuels	Fuels derived from renewable biological sources (biomass) using various biological, thermal and chemical processes. Biofuels can be classified into different generations depending on the type of feedstock used for their production.
Bitumen	A naturally occurring solid or semi-solid hydrocarbon that is abundant in Alberta's oil sands, consisting of heavier hydrocarbons that are too viscous or dense to flow without being diluted or heated. Bitumen may be mined or produced in situ and is upgraded and refined into crude oil and other petroleum products.
Blue hydrogen	A fuel produced by combining natural gas and steam in the presence of a catalyst. The products are hydrogen and carbon dioxide, which is captured and stored.
Carbon capture and storage (CCS)	The process of capturing carbon dioxide from industrial processes or directly from the air (direct air capture) and storing it underground, with the aim of preventing its release into the atmosphere.
Carbon fibre	A product that can be derived from bitumen, with high strength-to-weight properties that make it ideal for many manufacturing applications.
Cogeneration	The production of steam and electricity through a natural-gas-fired process, which has a lower GHG intensity than if the steam and electricity were produced independently.
Decarbonization	An approach to reduce or eliminate the release of greenhouse gases to the atmosphere from a facility or operation.
Downstream	The upgrading and/or refining of crude oil and/or the distribution and sale of refined products in retail and wholesale markets.
Energy expansion	The growth of Suncor's energy production portfolio in existing, complementary businesses, including low-carbon power, renewable fuels and hydrogen, to help meet growing energy demand.
Energy transition	The shift from higher- to lower-carbon sources of energy production and consumption.
Enhanced Solvent SAGD (ES-SAGD)	A SAGD process that involves the partial replacement of steam with a hydrocarbon solvent to reduce water consumption and GHG emissions intensity.
Extra Low Intensity Thermal Extraction (ELITE)	A SAGD process that lowers operating pressures and temperatures to improve the efficiency of extracting bitumen.
First-generation biofuels	Fuels that are produced from food crops or edible vegetable oils using commercially available methods, such as the fermentation of sugars and starches. Examples include bioethanol (created by fermenting sugars from food crops) and biodiesel (from vegetable oils).
Fuel switching	The substitution of a fuel that has a higher GHG intensity with a fuel that has a lower GHG intensity.
Gas fermentation	The process of using microorganisms, typically bacteria, to convert gases such as carbon dioxide, carbon monoxide and hydrogen into value-added fuels and chemicals. Gas fermentation can be used to produce biofuels such as ethanol.

Glossary

Term	Definition
Greenhouse gas (GHG)	The six gases listed in the Kyoto Protocol: carbon dioxide (CO ₂); methane (CH ₄); nitrous oxide (N ₂ O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF ₆). (GHG Protocol Corporate Standard, 2004)
GHG emission credit	A verified GHG reduction achieved by reducing GHG emissions at a source or causing GHG removals from the atmosphere. Emission credits can be sold and used for compliance by regulated facilities or to meet voluntary climate commitments. Typically, one credit is equivalent to one metric tonne of CO ₂ equivalent.
GHG offset	A GHG emission credit that is used to compensate for emissions that occur elsewhere.
Green hydrogen	A fuel produced by splitting water (electrolysis) using renewable electricity. The products are hydrogen and oxygen.
Grey hydrogen	A fuel produced through steam methane reforming of natural gas. Methane is reacted with pressurized steam in the presence of a catalyst to produce hydrogen, carbon monoxide and carbon dioxide.
In situ	Refers to bitumen in oil sands “in its original place,” meaning bitumen is recovered directly from the deposit, with minimal land disturbance and no tailings (compared to mining). The most common recovery method is steam-assisted gravity drainage (SAGD). In situ production is required for approximately 80% of the bitumen found in the oil sands.
Low-carbon fuels	A variety of fuel types that have lower GHG emissions compared to conventional fossil fuels. Examples include renewable ethanol, sustainable aviation fuel and low-carbon hydrogen.
Low-carbon hydrogen	Fuel produced using methods that have a lower GHG intensity than grey hydrogen, such as blue, green and turquoise hydrogen.
Low-carbon power	A variety of energy sources produced with lower emissions, such as cogeneration and renewable electricity.
Net-zero emissions	Emissions of GHGs resulting from human activities are equivalent to the quantity of emissions reduced or removed, to achieve zero emissions, on balance.
Oil sands	Naturally occurring deposits consisting of a mixture of sand, water, clay and a type of oil called bitumen. Oil sands deposits are found throughout the world, but Alberta’s Athabasca deposit is the largest and Alberta uses the most advanced production processes.
Petroleum coke (also coke or petcoke)	A solid carbon byproduct of the oil upgrading and refining process with applications in energy production and many types of manufacturing. Suncor produces high-sulphur-fuel-grade petroleum coke at its oil sands operations in Fort McMurray and its refinery near Edmonton, and markets it in North America and globally.
Renewable fuels	Fuels produced from a variety of renewable sources such as biomass and renewable energy using various biological, thermal and chemical processes. Examples include biofuels and certain types of low-carbon hydrogen.
Scope 1 emissions	Direct GHG emissions resulting from sources that are controlled or owned by an organization.
Scope 2 emissions	Emissions associated with generating electricity, heating/cooling, or steam purchased for use in a facility or operation.

Glossary

Term	Definition
Scope 3 emissions	GHG emissions that result from products and activities outside an organization's ownership and control but that are part of its value chain, such as from the combustion of fuel purchased by its customers.
Solvent-dominated processes	The full or near-full replacement of steam with a hydrocarbon solvent, including the potential application of heat, in in situ operations.
Steam-assisted gravity drainage (SAGD)	A method of in situ bitumen recovery that involves injecting steam into sub-surface oil sands deposits to heat bitumen, using one well, and allowing the bitumen to flow to a second well, where it is pumped to the surface. The water used in the process is recovered and reused.
Syngas	Also known as synthesis gas, it includes a mixture of hydrogen, carbon monoxide, carbon dioxide and other gases that can be converted to fuels and chemicals using various biological, thermal and chemical processes.
Turquoise hydrogen	A fuel produced by decomposing natural gas with heat (methane pyrolysis). The products are hydrogen and solid carbon, which can be used as a feedstock for other industries and products.
Upstream	The exploration, development and production of oil and gas.

Performance data

Our performance data provides annual (January 1 to December 31) GHG-related information, with five-year trends, where available. Data is reported on both an operated and equity basis unless the data are the same or as otherwise noted. Some values, including corporate totals and year-over-year calculations, may not work out exactly as shown due to rounding. Any 2022 data points accompanied by the (A) symbol were included in the KPMG LLP limited assurance engagement scope. See page 91 of the [2023 Report on Sustainability](#) for KPMG's limited assurance report. Due to different reporting methods and boundaries, not all data is consistent with our 2022 Annual Report.

Additional data can be found in our [2023 Sustainability Performance Data](#) document.

Indicators	2018	2019	2020	2021	2022
Production – Operated³					
Sum of liquid hydrocarbon production <i>million m³ of liquid hydrocarbon</i>	115.29	126.30	113.46	116.75	123.31 (A)
Bitumen production <i>million m³ of bitumen</i>	53.99	59.43	52.47	55.82	59.58
Synthetic crude production <i>million m³ of synthetic crude</i>	31.58	36.43	34.71	34.91	36.15
Offshore crude production <i>million m³ of offshore crude</i>	1.81	1.79	0.00	0.00	0.00
Refined liquid hydrocarbon production <i>million m³ of refined liquid hydrocarbon</i>	27.50	28.25	25.94	25.69	27.23
Renewable fuels production <i>million m³ of renewable fuel</i>	0.40	0.40	0.34	0.34	0.36
Oil sands electricity generation <i>million MWh of electricity</i>	10.57	10.89	10.81	10.57	10.69
Generated electricity internally consumed <i>million MWh of electricity</i>	6.72	7.29	7.00	6.93	7.35
Generated electricity exported <i>million MWh of electricity</i>	3.85	3.60	3.81	3.64	3.34
Wind electricity generation <i>million MWh of electricity</i>	100,850	98,419	96,952	114,009	130,660
Ethanol production <i>million m³ of ethanol product</i>	0.40	0.40	0.34	0.34	0.36
Renewable fuels blended <i>million m³</i>	1.13	1.14	1.44	1.54	1.60
Production – Equity³					
Sum of liquid hydrocarbon production <i>million m³ of liquid hydrocarbon</i>	102.16	110.41	101.56	103.93	107.10
Bitumen production <i>million m³ of bitumen</i>	43.17	46.58	41.60	44.94	46.26
Synthetic crude production <i>million m³ of synthetic crude</i>	25.41	29.24	27.92	28.06	28.83
Offshore crude production <i>million m³ of offshore crude</i>	5.68	5.95	5.76	4.91	4.41
Refined liquid hydrocarbon production <i>million m³ of refined liquid hydrocarbon</i>	27.50	28.25	25.94	25.69	27.23
Renewable fuels production <i>million m³ of renewable fuel</i>	0.40	0.40	0.34	0.34	0.36
Oil sands electricity generation <i>million MWh of electricity</i>	8.66	8.84	8.83	8.56	8.61

Performance data

Indicators	2018	2019	2020	2021	2022
Generated electricity internally consumed <i>million MWh of electricity</i>	5.20	5.62	5.45	5.41	5.69
Generated electricity exported <i>million MWh of electricity</i>	3.46	3.21	3.38	3.16	2.92
Greenhouse gas (GHG) emissions – Operated^{4,5}					
Total GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	34.06	35.19	33.43	34.15	34.96 (A)
Total GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	32.41	33.67	32.02	32.69	33.52
Total GHG (scope 2) emissions <i>million tonnes of CO₂e</i>	1.64	1.52	1.41	1.46	1.45
Sum of liquid hydrocarbon production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	33.13	34.35	32.54	33.36	34.19
Bitumen production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	17.12	17.58	16.62	18.15	17.84
Synthetic crude production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	10.30	10.89	10.77	10.14	11.14
Offshore crude production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	0.59	0.52	0.05	0.00	0.00
Refined liquid hydrocarbon production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	4.96	5.18	4.96	4.93	5.08
Renewable fuels production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	0.16	0.17	0.14	0.14	0.14
Oil sands electricity generation GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	2.53	2.58	2.56	2.45	2.50
Generated electricity internally consumed GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	1.60	1.73	1.67	1.66	1.73
Generated electricity exported GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	0.92	0.85	0.89	0.79	0.77
GHG intensity – Operated^{4,5}					
Sum of liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>grams of CO₂e/MJ of liquid hydrocarbon</i>	7.12	6.73	7.10	7.06	6.84
Sum of liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of liquid hydrocarbon</i>	0.29	0.27	0.29	0.29	0.28 (A)
Bitumen production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of bitumen</i>	0.32	0.30	0.32	0.33	0.30
Synthetic crude production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of synthetic crude</i>	0.33	0.30	0.31	0.29	0.31
Offshore crude production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of offshore crude</i>	0.33	0.29	–	–	--
Refined liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of refined liquid hydrocarbon</i>	0.18	0.18	0.19	0.19	0.19
Renewable fuels production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of renewable fuel</i>	0.40	0.42	0.42	0.41	0.39
Oil sands electricity generation GHG (scope 1) intensity <i>tonnes of CO₂e/MWh of electricity</i>	0.24	0.24	0.24	0.23	0.23
GHG emissions – Equity^{4,5}					
Total GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	28.16	29.22	27.88	28.58	28.81

Performance data

Indicators	2018	2019	2020	2021	2022
Total GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	26.56	27.70	26.46	27.10	27.34
Total GHG (scope 2) emissions <i>million tonnes of CO₂e</i>	1.61	1.53	1.42	1.48	1.47
Sum of liquid hydrocarbon production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	27.33	28.47	27.10	27.91	28.14
Bitumen production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	13.93	14.40	13.69	14.98	14.54
Synthetic crude production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	7.59	8.04	7.76	7.39	7.97
Offshore crude production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	0.70	0.69	0.54	0.47	0.44
Refined liquid hydrocarbon production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	4.96	5.18	4.96	4.93	5.08
Renewable fuels production GHG (scope 1 & 2) emissions <i>million tonnes of CO₂e</i>	0.16	0.17	0.14	0.14	0.14
Oil sands electricity generation GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	2.09	2.11	2.10	1.98	2.02
Generated electricity internally consumed GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	1.26	1.35	1.32	1.30	1.36
Generated electricity exported GHG (scope 1) emissions <i>million tonnes of CO₂e</i>	0.83	0.76	0.79	0.67	0.67
GHG intensity – Equity^{4,5}					
Sum of liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>grams of CO₂e/MJ of liquid hydrocarbon</i>	6.67	6.42	6.65	6.68	6.53
Sum of liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of liquid hydrocarbon</i>	0.27	0.26	0.27	0.27	0.26
Bitumen production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of bitumen</i>	0.32	0.31	0.33	0.33	0.31
Synthetic crude production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of synthetic crude</i>	0.30	0.27	0.28	0.26	0.28
Offshore crude production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of offshore crude</i>	0.12	0.12	0.09	0.10	0.10
Refined liquid hydrocarbon production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of refined liquid hydrocarbon</i>	0.18	0.18	0.19	0.19	0.19
Renewable fuels production GHG (scope 1 & 2) intensity <i>tonnes of CO₂e/m³ of renewable fuel</i>	0.40	0.42	0.42	0.41	0.39
Oil sands electricity generation GHG (scope 1) intensity <i>tonnes of CO₂e/MWh of electricity</i>	0.24	0.24	0.24	0.23	0.24
Energy use – Operated^{4,5}					
Total energy use <i>million GJ</i>	473.87	508.99	465.63	488.04	497.36 (A)
Direct energy use <i>million GJ</i>	466.29	503.81	461.48	480.36	489.47
Indirect energy use <i>million GJ</i>	7.56	5.18	4.15	7.63	7.89
Energy intensity <i>GJ/m³ of liquid hydrocarbon</i>	4.11	4.03	4.10	4.18	4.03

Performance data footnotes

1 Overview

These notes provide additional details on reporting boundaries, calculations, and changes in methodologies, definitions, business segment structures and historical data. In 2023, we updated our reporting methodology to capture total production as the sum of all liquid hydrocarbons produced from our business activities. This method differs from our Annual Report, which uses production values based on final products sold to market. Our previous reporting for corporate intensities deducted product transfers within our business and did not reflect the many activities involved in making both intermediate and final products. Accordingly, performance data will now be reported using total production rather than final product sold to market, unless otherwise noted. Due to this change, corporate intensity values are lower than previously reported, although absolute emissions remain the same. Some values, including corporate totals and year-over-year calculations, may not work out as shown due to rounding.

2 Reporting boundaries

- a. Performance data is reported for Suncor-operated facilities (100%) and on an equity basis (reflecting our ownership share).
- b. Production data in this report may not match our 2022 Annual Report due to different reporting methods and boundaries.
- c. As of January 2023, we do not operate or have equity interest in renewable power facilities.
- d. Suncor assumed operatorship of the Syncrude Project on September 30, 2021. Syncrude's data alignment is largely complete and any further updates will be reflected in future reports. All 2018-2022 performance data in the 2023 Climate Report includes Syncrude, unless otherwise stated.
- e. Any information or data pertaining to our Libya or Syria assets are not included in this report.
- f. Facilities are subject to annual planned and unplanned maintenance activities, which may impact the consistency of year-over-year trends.
- g. Facilities that are purchased and subsequently operated by Suncor in a reporting year may not be included in totals, unless owned or operated for the entire year (12 months).
- h. Refer to the 2023 Report on Sustainability footnote 3 for more information on our business segments and operations.

3 Notes on operational performance and production

- a. The sum of liquid hydrocarbon production represents total production throughout our business, including bitumen, synthetic crude, offshore crude, refined liquid hydrocarbons and renewable fuels. Internal consumption is not deducted from this total. This value includes highly viscous liquid and semi-solid hydrocarbons and excludes solids, gases and non-hydrocarbons.
- b. Bitumen production is the total volume of bitumen produced at our sites and includes upgraded and non-upgraded volumes. This value is compiled from Base Plant, Syncrude, Fort Hills and in situ.
- c. Synthetic crude production is a mixture of liquid hydrocarbons derived by upgrading bitumen and includes products such as synthetic crude oil blends, diesel, diluents and intermediates. This value excludes solids, gases and non-hydrocarbons such as petroleum coke, fuel gas and sulphur. This value is compiled from Base Plant and Syncrude.
- d. Offshore crude production is crude oil that is produced by offshore facilities and excludes gases associated with petroleum gas. It includes production from the Terra Nova facility, which has been shut in since the fourth quarter of 2019.
- e. Refined liquid hydrocarbon production is the salable yield of liquid hydrocarbons produced at refineries and includes products such as gasoline, distillates, liquified petroleum gases, intermediates, heavy fuel oils, petrochemical feedstocks, and highly viscous liquid or semi-solid hydrocarbons like asphalt. It excludes solids and non-hydrocarbons such as petroleum coke, sodium bisulphite and sulphur. This production value is compiled with data from our refineries in Sarnia, Montreal, Commerce City and Edmonton.
- f. Renewable liquid fuel production represents liquid fuels produced from renewable sources, which currently includes our St. Clair ethanol plant.
- g. Oil sands electricity generation represents oil sands and in situ cogeneration, gas generation and steam turbine generation, and excludes electricity from mobile generators. It is disaggregated into internally consumed and exported electricity.
- h. Wind power generation is reported only on an operated basis.

Performance data footnotes

- i. There were changes made to specific sites production values to align with the new methodologies listed above. Significant changes listed as follows: Base Plant production now includes both Bitumen and Synthetic crude, where only Synthetic crude was reported in the past (resulting in an average of a ~90% increase), Syncrude production including both Bitumen and Synthetic crude (resulting in an average of a ~120% increase), where only Syncrude Sweet Product was reported in the past and Sarnia including values from hydrotreated volumes previously not included (resulting in an average of a ~20% increase).

4 Notes on GHG emissions

4.1 GHG emissions factors

GHG emissions from our activities (e.g., production and fuel consumption) are estimated using emission factors and expressed in tonnes of carbon dioxide equivalent (CO₂e). This metric represents different gases based on their global warming potential (GWP) compared to carbon dioxide (which has a GWP of 1), using a common unit. Our 2015-2021 reporting used the 100-year GWP factors issued by the Intergovernmental Panel on Climate Change (IPCC) fourth assessment report (2007), which is aligned with the reporting conventions of agencies like Environment Canada and the U.S. Environmental Protection Agency (EPA). Starting with our 2023 report we are using the 100-year GWP factors issued by the IPCC fifth assessment report (2014), which is aligned with the Environment and Climate Change Canada (ECCC) Greenhouse Gas Reporting Program (GHGRP).

4.2 Measuring and estimating GHG emissions

As our operations span multiple jurisdictions, sectors and types of operations, we use several protocols, including those of regulatory bodies (e.g., US EPA, Western Climate Initiative, Government of Alberta) and the World Resources Institute to develop facility-specific emission calculations. We determine the appropriate calculation protocol(s) based on jurisdiction, type of facility, emission source, and fuel type and composition. If there is no prescribed protocol for a specific equipment, a combination of standardized methodologies and sector-specific approaches are used.

Whenever possible, emission factors used in these calculations are derived from actual measured data rather than default factors. Factors that are derived from direct measurement, inferred from compositional data or are manufacturer-supplied provide the highest-quality data. In addition to using fuel-specific emission factors that rely on volumes, some emissions are calculated using process- or equipment-specific consumption rates in units such as run-hours. Due to the diversity of our operations, we have more than 1,400 standard factors in our database. This does not include thousands of other factors calculated daily for different fuels and sites based on fuel composition analysis.

4.3 GHG standard practices and methodologies

External agencies have developed standard, industry-specific methodologies that operators can choose to use in the absence of prescribed methods. The standard practices and methodologies we follow are widely accepted and documented so the numbers produced are verifiable by governments and third parties and are consistently applied from year to year.

These methodologies and guidance documents include:

- American Petroleum Institute (API) Compendium of Greenhouse Gas Emissions Methodologies for the Natural Gas Industry, 2009
- US EPA Mandatory Reporting of Greenhouse Gases Rule
- IPCC Fifth Assessment Report, 2014
- World Business Council for Sustainable Development/World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, 2004
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- Western Climate Initiative Design for the WCI Regional Program, July 2010
- Western Climate Initiative Final Essential Requirements of Mandatory Reporting: Amended for Canadian Harmonization, 2013
- Alberta Greenhouse Gas Quantification Methodologies, Technology Innovation and Emissions Reduction Regulation, Version 2.2
- Quebec's regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, 2022
- Canada's Greenhouse Gas Quantification Requirements, Greenhouse Gas Reporting Program, 2022
- Environment Canada National Inventory Report, 1990-2020
- EPA eGRID2021 for US assets

Performance data footnotes

4.4 Additional GHG notes

- a. Total GHG emissions are the sum of scope 1 (direct) and scope 2 (indirect) emissions.
 - Operated emissions represent 100% of operated assets.
 - Equity emissions are based on Suncor's working interest in operated and non-operated assets.
- b. Total GHG emissions do not consider our low-carbon power exports as a benefit, to align with regulatory reporting. This benefit is calculated using the quantity of cogeneration power exports and the difference between cogeneration power intensity and the Alberta grid intensity. The benefit is included in the calculation of our GHG emission intensities.
- c. The aggregate Suncor intensity calculation incorporates the sum of liquid hydrocarbon production, resulting in a production value reflective of our activities as an integrated company. The aggregate Suncor intensity will therefore not equal the weighted-average of product intensities.
- d. MacKay River scope 2 emissions include purchased electricity from the grid, and purchased electricity and steam from the third-party TransCanada cogeneration units.
- e. The Base Plant, Fort Hills, Syncrude and Firebag cogeneration units are operated by Suncor and 100% of cogeneration emissions contribute to total scope 1 emissions, including emissions associated with electricity that is sold to the Alberta grid.
- f. Refining and Logistics scope 1 emissions do not deduct CO₂ transfers to third parties.
- g. Scope 2 emissions are calculated based on actual supplier data if available and published literature if supplier data is unavailable.
- h. Scope 2 GHG emissions for MacKay River have been restated from 2018-2021 to reflect updated methodology calculations.
- i. Scope 3 GHG emissions provided in our Climate Report include fuel- and energy-related activities (category 3), processing of sold products (category 10) and use of sold products (category 11).
- j. Category 3 emissions are estimated based on the total volume of natural gas used in Suncor's oil sands mining, in situ and refining operations, on an equity interest basis. Suncor estimates the extraction, production and transportation emissions associated with natural gas supplied to our operations. Diesel use is excluded.
- k. Category 10 emissions are estimated based on the volume of intermediate products sold by Suncor to other refineries and the regions to which they were sold, on an equity interest basis. Intermediate products assessed include bitumen, synthetic crude oil and offshore crude oil.
- l. Category 11 emissions are estimated based on the following methods, on an equity interest basis:
 - Upstream production: The sum of upstream hydrocarbon production, assuming it is processed into refined products and combusted. Includes net shipped quantities of bitumen, synthetic crude, offshore crude and petroleum coke. GHG emission factors were sourced from the US EPA 2022 GHG Emission Factors Hub and the 2021 API Compendium of GHG Emission Methodologies.
 - Refinery throughput: The sum of refined products at our Edmonton, Commerce City, Sarnia and Montreal refineries. Includes gasoline, distillates, and combustibles such as propane, butane, petcoke and heavy fuel oil. GHG emission factors were sourced from the US EPA 2022 GHG Emission Factors Hub and the 2021 API Compendium of GHG Emission Methodologies.
 - Branded sales: The sum of refined product sales to retail customers within Canada and the US, excluding wholesale products. Carbon dioxide emissions from renewable fuels that are blended with the refined products have been subtracted, as renewable fuel combustion emissions are considered carbon neutral.
- m. Our GHG objectives encourage emission reductions throughout our value chain. To support tracking our progress, Suncor has a methodology that quantifies direct reductions from our operations and indirect reductions from the use of our products.
- n. Regulations, such as Alberta's TIER, require that we have our facility emissions third-party verified at a reasonable level of assurance. Since regulatory and sustainability reporting timelines do not necessarily align, not all regulatory verifications may have been final at the time of publication of this report.
- o. Emissions data from operations in which we have an equity interest may not have been verified and is subject to change.
- p. No credit is taken in our scope 1 and 2 GHG performance data for the benefits associated with internally generated performance credits, purchased offsets, ethanol life-cycle GHG reductions or wind-generated offsets.

Performance data footnotes

- q. GHG emission allocations by liquid hydrocarbon production (i.e., bitumen, synthetic crude, offshore crude, refined liquid hydrocarbons and renewable fuels) are based on guidance provided in the GHG Protocol and internal engineering methodologies.
- r. The sum of liquid hydrocarbon production emissions and oil sands electricity export emissions equals total scope 1 & 2 GHG emissions.
- s. 2020 GHG data for Terra Nova is included within the offshore crude production GHG (scope 1 and 2) emissions value.
- t. Due to the new production methodology, our resulting sum of liquid hydrocarbon production GHG (scope 1 & 2) intensity value has decreased by ~30%, although the absolute value has remained the same.

5 Notes on energy use

- a. Total energy is equal to the sum of direct and indirect energy. Electricity that was produced and sold to provincial grids by oil sands and in situ cogeneration units and operated wind farms is converted to an equivalent amount in gigajoules and deducted from total energy use.
- b. Direct energy is primary energy consumed on site by Suncor-operated facilities.
- c. Indirect energy includes imported electricity, steam, heating and cooling from third parties. The indirect energy calculation method credits operations for electricity exported to external users.
- d. Indirect energy consumption has been restated for MacKay River from 2018-2021 to reflect updated methodology calculations.
- e. Energy use is reported only on an operated basis.
- f. The emissions factors used in this report are the most recently published values for Canada from the National Inventory Report (NIR) taken as of December 31 of the reporting year, which is the NIR 2022 factors for 2019. The exception to this is the Commerce City refinery, which used the eGRID2021 factor for 2021.

Advisories

Forward-looking statements

Suncor's 2023 Climate Report contains certain forward-looking statements and forward-looking information (collectively, "forward-looking statements") within the meaning of applicable Canadian and U.S. securities laws. Forward-looking statements in Suncor's 2023 Climate Report include references to: the belief that Suncor's climate objectives depend on decarbonizing our operations and expanding low-emissions businesses; Suncor's strategy to be Canada's leading energy company by optimizing our existing hydrocarbon business and transforming our greenhouse gas (GHG) footprint, while growing our business in low GHG fuels, electricity and hydrogen; our objectives of reaching net zero emissions by 2050 (scope 1 and scope 2) and contributing to societal emission reduction goals; our interim objective of a 10 megatonne (Mt) reduction in emissions by 2030 across our value chain; our objective of reducing emissions in our base business and working with others to reduce emissions; the belief that we are advancing a suite of projects to reach our objectives with a focus on reducing base business emissions with fuel switching, energy efficiency and carbon capture and storage (CCS), and to grow profitable businesses in low-carbon power, renewable fuels and low-carbon hydrogen; that from 2021-2025 we expect to spend approximately 10% of our annual capital budget, on average, on projects aimed at lowering our emissions and advancing our low-carbon energy offerings, of which a significant portion would be allocated to projects that provide strong, double-digit returns; the belief that the commercial pilots of in situ solvent technologies that we continue to invest in have the potential to lower emissions by 30-50%; the belief that we are on track to deliver a fuel-switching project at our Base Plant mine by mid-decade that will replace energy generation using petroleum coke with highly efficient gas cogeneration and that it will reduce emissions associated with our steam production by approximately 1 Mt per year, along with providing low-carbon power to the Alberta grid; the belief that we will continue to produce oil sands for many decades while improving our emissions performance; the expectation that we will continue to look at other decarbonization options; that fuel switching to low-carbon intensity fuels could address additional power generation, on-site transportation and a substantial portion of our heat and steam emissions; the belief that energy-efficiency projects can also be implemented throughout our operations to provide near-term incremental reductions in energy use and emissions; the expectation that our expanded energy offerings will be in business lines we understand well – low-carbon power, renewable fuels and hydrogen; the belief that the world relies on a diverse energy mix, most of which will be needed to meet future global energy demand; the expectation that a component of executive compensation will be directly determined by progress relative to our climate objectives, in the form of performance share units (PSUs) tied to the long-term incentive plan for the vice president level and up and that vesting of the initial award will be based on progress from 2022 through 2024 toward our 2030 commitment to reduce annual GHG emissions by 10 megatonnes (Mt) across our value chain; statements, beliefs, expectations, objectives and goals with respect to technologies and projects we feel have the greatest potential for base business emission reductions and novel areas we are exploring that include CCS, the Pathways Alliance, Svante Technologies Inc., fuel switching, the Base Plant Cogeneration project, process optimization, energy efficiency and reliability projects, steam-assisted gravity drainage (SAGD) enhancement processes including the Enhanced Solvent SAGD process, the Extra Low Intensity Thermal Extraction process, and SAGD solvent-dominated processes; statements, beliefs, expectations, objectives and goals with respect to the expansion of low-emissions businesses including low-carbon power (such as the Base Plant Cogeneration project), renewable power, renewable fuels (such as the St. Clair ethanol plant, Enerkem, and LanzaTech), sustainable aviation fuel (LanzaJet), hydrogen (such as blue hydrogen, green hydrogen and turquoise hydrogen) and alternative products such as carbon fibre; the expectation that as transportation options and infrastructure evolve, we will expand low-carbon alternatives to customers through our Petro-Canada wholesale and retail business and the beliefs, expectations, goal and projects related thereto; that we plan to launch Petro-Canada EcoDiesel in Ontario in 2023; that we are working with domestic and international airlines to explore the market for SAF as part of our strategy to operate renewable fuel production facilities in North America; statements, beliefs, expectations, objectives and goals with respect to testing hydrogen for transport including the Alberta Zero Emissions Truck Electrification Collaboration and the Alberta Zero Emission Hydrogen Transit; the belief that through proactive engagement from business and supply chain sponsors, we expect to advance specific environmental objectives with our core suppliers in the coming years; expectations and goals about our risk management processes at Suncor; goals and expectations of certain policies and guidelines including Canada's climate plans and targets including the Emissions Reduction Plan (2022) and the Canadian regulatory framework to reduce oil and gas methane emissions by at least 75% by 2030; that the aim of our climate engagement and advocacy activities is to help Canada meet its Paris Agreement commitments through a collaborative approach between industry and all levels of government, and to advocate for the development of a robust regulatory and fiscal framework; that the economy-wide carbon price backstop is projected to reach \$170 per tonne of CO₂ by 2030; the expectation that new Clean Fuel Regulations will come into effect in July 2023; that other policies, including an electricity standard, oil and gas emission cap and methane regulations are proposed; that Canada's Emissions Reduction Plan has a projection of a 42% reduction in oil and gas GHG emissions by 2030, compared to 2019 levels; that the estimated 10-year (2023-2032), before-tax, average cost of carbon is \$1.70 per barrel for our upstream net production and \$0.48 per barrel for our downstream salable yield; the belief that provincial regulations like Alberta's TIER seek to mitigate investment loss and minimize carbon leakage; statements, beliefs, expectations, risks, objectives and goals with respect to our

Advisories

three climate scenarios, which include the Low Carbon, Free Markets and Discord scenarios; statements, beliefs, expectations, risks, impacts, mitigations, objectives and goals with respect to our physical assets including acute and chronic risk; the belief that, guided by our strategy, we are focused on reducing emissions by optimizing assets and investing in new technologies; that our focus is, first, on reducing base business emissions with fuel switching, energy efficiency and CCS, and, second, growing profitable businesses in low-carbon power, renewable fuels and hydrogen; that we estimate about half of our 10 Mt objective will be met by direct emission reductions in our operations and the rest elsewhere in our value chain, including through the sale of low-carbon products; the belief that, over time, our emissions will be reduced directly and through the generation of credits that can offset our emissions and also be retired for compliance purposes; the expectation that while we work to reduce our own GHG emissions, we will work with suppliers to help reduce their emissions and support our customers looking for low-carbon energy choices; and that we are also making efforts to work with our suppliers, service providers and other business partners to reduce emissions elsewhere in our value chain, including in the areas of “purchased goods and services” (category 1), “capital goods” (category 2), “fuel and energy-related activities” (category 3) and “processing of sold products” (category 10).

Some of the forward-looking statements and information may be identified by words like “expected”, “anticipated”, “will”, “estimates”, “plan”, “scheduled”, “intended”, “believes”, “projected”, “indicates”, “could”, “focus”, “vision”, “mission”, strategy, “goal”, “outlook”, “proposed”, “target”, “objective”, “continue”, “should”, “may”, “aim”, “strives”, “would”, “potential”, “committed”, “opportunity” and similar expressions. Forward-looking statements are based on Suncor’s current expectations, estimates, projections and assumptions that were made by the company in light of information available at the time the statement was made and consider Suncor’s experience and its perception of historical trends, including expectations and assumptions concerning: the accuracy of reserves and resources estimates; commodity prices and interest and foreign exchange rates; the performance of assets and equipment; capital efficiencies and cost savings; applicable laws and government policies, future production rates; the sufficiency of budgeted capital expenditures in carrying out planned activities; the availability and cost of labour, services and infrastructure; the satisfaction by third parties of their obligations to Suncor; the development and execution of projects; the receipt, in a timely manner, of regulatory and third-party approvals; assumptions relating to demand for oil, natural gas, distillates, gasoline, diesel and other energy sources; the development and performance of technology; population growth and dynamics; assumptions relating to long-term energy future scenarios; and Suncor’s carbon price outlook. 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 Suncor. Suncor’s actual results may differ materially from those expressed or implied by its forward-looking statements, so readers are cautioned not to place undue reliance on them. Risks, uncertainties and other factors that could influence the financial and operating performance of all of Suncor’s operating segments and activities include, but are not limited to, changes in general economic, market and business conditions, such as commodity prices, interest rates and currency exchange rates (including as a result of the actions of OPEC and non-OPEC countries); fluctuations in supply and demand for Suncor’s products; the successful and timely implementation of capital projects, including growth projects and regulatory projects; risks associated with the development and execution of Suncor’s major projects and the commissioning and integration of new facilities; the possibility that completed maintenance activities may not improve operational performance or the output of related facilities; the risk that projects and initiatives intended to achieve cash flow growth and/or reductions in operating costs may not achieve the expected results in the time anticipated or at all; competitive actions of other companies, including increased competition from other oil and gas companies or from companies that provide alternative sources of energy; labour and material shortages; actions by government authorities, including the imposition or reassessment of, or changes to, taxes, fees, royalties, duties, and other government-imposed compliance costs; changes to laws and government policies that could impact the company’s business, including environmental (including climate change), royalty and tax laws and policies; the ability and willingness of parties with whom Suncor has material relationships to perform their obligations to the company; the unavailability of, or outages to, third-party infrastructure that could cause disruptions to production or prevent the company from being able to transport its products; the occurrence of a protracted operational outage, a major safety or environmental incident, or unexpected events such as fires (including forest fires), equipment failures and other similar events affecting Suncor or other parties whose operations or assets directly or indirectly affect Suncor; the potential for security breaches of Suncor’s information technology and infrastructure by malicious persons or entities, and the unavailability or failure of such systems to perform as anticipated as a result of such breaches; security threats and terrorist or activist activities; the risk that competing business objectives may exceed Suncor’s capacity to adopt and implement change; risks and uncertainties associated with obtaining regulatory, third-party and stakeholder approvals outside of Suncor’s control for the company’s operations, projects, initiatives and exploration and development activities and the satisfaction of any conditions to approvals; the potential for disruptions to operations and construction projects as a result of Suncor’s relationships with labour unions that represent employees at the company’s facilities; our ability to find new oil and gas reserves that can be developed economically; the accuracy of Suncor’s reserves, resources and future production estimates; market instability affecting Suncor’s ability to borrow in the capital debt markets at acceptable rates or to issue other securities at acceptable prices; maintaining an optimal debt-to-cash-flow ratio; the success

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of the company's marketing and logistics activities using derivatives and other financial instruments; the cost of compliance with current and future environmental laws, including climate change laws; risks relating to increased activism and public opposition to fossil fuels and oil sands; risks and uncertainties associated with closing a transaction for the purchase or sale of a business, asset or oil and gas property, including estimates of the final consideration to be paid or received, the ability of counterparties to comply with their obligations in a timely manner; risks associated with joint arrangements in which the company has an interest; risks associated with land claims and Aboriginal consultation requirements; the risk the company may be subject to litigation; the impact of technology and risks associated with developing and implementing new technologies; and the accuracy of cost estimates, some of which are provided at the conceptual or other preliminary stage of projects and prior to commencement or conception of the detailed engineering that is needed to reduce the margin of error and increase the level of accuracy. The foregoing important factors are not exhaustive.

Suncor's Management's Discussion and Analysis for the first quarter of 2023 dated May 8, 2023, its Annual Information Form, Annual Report to Shareholders and Form 40-F, each dated March 6, 2023, 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 at 150 6th Avenue S.W., Calgary, Alberta T2P 3E3, by calling 1-800-558-9071, or by email request to info@suncor.com 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.

Suncor

Suncor Energy Inc. has numerous direct and indirect subsidiaries, partnerships and joint arrangements ("affiliates"), which own and operate assets and conduct activities in different jurisdictions. The terms "we", "our", "Suncor", or "the company" are used herein for simplicity of communication and only mean that there is an affiliation with Suncor Energy Inc., without necessarily identifying the specific nature of the affiliation. The use of such terms in any statement herein does not mean that they apply to Suncor Energy Inc. or any particular affiliate and does not waive the corporate separateness of any affiliate.

Partnerships

The use of "partnership" throughout Suncor's 2023 Climate Report does not necessarily mean a partnership in the legal context.

Currency

Unless otherwise stated, references to "dollars" or "\$" means Canadian dollars.

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