



**Climate  
Report  
2022**



# Table of contents

<b>■ Introduction</b>	<b>3</b>
Message from our executives	3
Navigating the energy transition – Meeting ambition with action	4
<b>■ Climate strategy</b>	<b>5</b>
Suncor’s purpose, strategy and objectives	5
Reduce emissions in our base business	6
Expand low-emissions businesses	10
Work with others to reduce emissions	14
<b>■ Governance and risk management</b>	<b>16</b>
Climate governance	17
Risk management	19
<b>■ Metrics and targets</b>	<b>26</b>
GHG objectives	27
GHG emissions	28
<b>■ Appendix</b>	<b>33</b>
Performance data	34
Performance data footnotes	36
Advisories	41

# Introduction

## Message from our executives

Global uncertainties are prompting many countries to reconsider their energy sources and highlighting the importance of access to trusted energy. Geopolitical conflicts are exacerbating the increase in energy costs that began with last year's market imbalances, driving many commodity prices to record levels. These dynamics reinforce the importance of multiple objectives – access to energy, energy security, reliability, affordability and social well-being, among them. Some suggest that these events will reduce the focus and action on climate. We disagree. We must take an “all of the above” approach to both energy security and emission reductions – our climate has not become any less important.

Earlier this year, Suncor appointed a Chief Climate Officer, the first role of its kind in Canada's energy industry, underscoring the vital importance of this issue to our company. We also strengthened the link between the compensation of our executives and Suncor's objective of reducing greenhouse gas (GHG) emissions by 10 megatonnes by 2030, toward our long-term objective of net zero by 2050. This is aligned with the goals of the Paris Agreement and our purpose – to provide trusted energy that enhances people's lives while caring for each other and the Earth. The strategy that we announced last year will enhance how Suncor prospers through the energy transition as we integrate climate risks and opportunities into our businesses and plans. Through our investments in cogeneration and carbon capture technology we're reducing emissions from our base business while we strengthen our focus on hydrogen and low-carbon renewable fuels. We are excited by the opportunity to grow returns and market share in emerging businesses while continuing to optimize our base business.

Suncor is pleased to disclose progress made on the climate objectives in our strategy. As we work to reduce our own GHG emissions, we continue to work with suppliers to help them reduce theirs and support our customers looking for cleaner energy choices (for example, with our Petro-Canada™ Canada's Electric Highway™). We're providing additional GHG scope 3 disclosure to demonstrate our journey to more widespread emission reductions across our value chain.

The low-carbon energy transition will take time and discipline, an unwavering long-term focus, a great deal of financial investment and unprecedented collaboration among businesses, governments and society. Our partnership with industry peers in the Pathways Alliance is now a globally-recognized collaboration of competitors working together to solve these complex issues. The Canadian government's announcement this year of a tax credit for 50% of carbon capture technology costs is critical to our collective progress and signals the federal government's recognition of the importance of our industry for the long term. This kind of collaboration and investment from all levels of government and industry is key to accelerating carbon capture, use and storage (CCUS) in Canada, and other technologies and actions needed over time. Our engagement with stakeholders, including our investors, financial partners, customers, communities and Indigenous Peoples – along with the input and support of Suncor's Board of Directors – remain invaluable to our future success.

We must work together to help meet the world's climate goals, while doing our part to ensure global energy security and supply of energy – and continuing to deliver shareholder value. The profitability of our business, capital discipline, safety, operational excellence and growing long-term returns on invested capital are inseparable from achieving our climate objectives. We're making progress but we know this journey is a long-term commitment. We hope that our sixth annual Climate Report and our latest Report on Sustainability encourage you to engage with others in constructive and solutions-focused conversations about how we can collectively progress on the climate front, while ensuring that energy is accessible, secure, reliable and affordable for all. Amidst today's many challenges, these conversations are more needed than ever.

**Mark Little**  
President and Chief Executive Officer

**Martha Hall Findlay**  
Chief Climate Officer

# Navigating the energy transition – Meeting ambition with action



For several years, we have witnessed unprecedented market volatility – from oil market oversupply and negative prices in 2020 to shortages and soaring prices today, in energy and non-energy commodities. It is estimated that a record 13% of global GDP will be spent on primary energy demand in 2022.<sup>1</sup> A culmination of factors – underinvestment in oil and gas, public anxiety about climate change, challenges to developing large projects, a global pandemic, inflation, geopolitical conflicts and war – have brought to light issues of emissions, energy security, affordability and social well-being.

This volatility and the impact on people have underscored the tension between our current energy system and where we need to be to achieve net-zero commitments. Recent events have raised awareness about the attributes of different sources of energy, highlighting that while carbon is a key measure, it is only one aspect of performance. Hence, we maintain that Canadian oil has unparalleled potential to help ensure long-term, dependable and affordable supplies of energy for the world as we collectively transition to a net-zero economy. We firmly believe these objectives are complementary, not contradictory.

We need a thoughtful and balanced energy transition, supported by adequate investment and conducive regulations. Despite an accelerated pace of technology and innovation, the world is struggling to scale solutions. Development of opportunities like renewable energy, hydrogen and CCUS are hampered by challenging economics, complex regulatory environments, and system capacity and timing concerns – along with surging input costs, geopolitical and supply chain risks, and environmental and social impacts of their own. This has resulted in a build-up of capital but a relative shortage of opportunities and, hence, meaningful progress in

adequate project development. This trend must change. To provide attractive returns to global investors, our collective effort as industry, governments and the financial community is to create an attractive fiscal and regulatory environment that puts willing capital to work on strong energy-transition projects.

Encouragingly, record outflows of capital away from energy are slowly reversing, with a growing sentiment amongst leading investors that divesting oil and gas is counteractive to overall success. Traditional energies are fundamental to building the new energy economy – as a way of financing and fuelling new systems and as an essential part of the future mix, according to leading forecasts. Projects like the Pathways Alliance proposed carbon trunkline and sequestration hub and our partnership with ATCO on a world-leading hydrogen facility are the types of projects we are investing in today that can begin to reliably transition us to the low-carbon energies of tomorrow, within a decade. This is transition in action.

While the combined global events of the past few years may have been the most volatile in Suncor's history, they have reinforced our purpose. Our strategy positions us well to navigate the complex dynamics of energy markets and the energy transition, motivating us to optimize and transform our current assets. It allows us to use our strengths and capabilities to expand into exciting business lines that deepen our connection with consumers, while delivering on our shareholder commitments. As we envision our energy future, we aim to demonstrate leadership in sustainability and the energy transition and will focus our efforts on environmental success, social well-being and making real progress toward shared objectives. All of these are interrelated and driven by secure, reliable and affordable energy.

<sup>1</sup> Rob West, "Conclusions from March 2022: Rescuing the Energy Transition," Thunder Said Energy Research Note, Electronic mail, April 1, 2022.

# Climate strategy

- > Suncor's purpose, strategy and objectives
- > Reduce emissions in our base business
- > Expand low-emissions businesses
- > Work with others to reduce emissions

## Suncor's purpose, strategy and objectives

Climate change is a complex challenge that requires all of us to transform our relationship with energy. With that complexity comes risk, as well as an immense opportunity for those companies willing to embrace it and lead in the energy transition. Our purpose and commitment to shareholder returns sets us up to thrive in that future.

As an energy company with a strategy that keeps us resilient for the long term, we are charting a path to a net-zero world by reducing emissions in our base business, while expanding in complementary low-emissions businesses and working with our customers, governments and partners to realize our shared climate objectives.

### 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 growing our business in low greenhouse gas (GHG) fuels, electricity and hydrogen while sustaining and optimizing our existing hydrocarbon business and transforming our GHG footprint; all enabled by our expertise, long-life resources, integrated business model, strong connection to customers, and world-class environment, social and governance (ESG) performance.

### Our objectives

- Grow returns on capital
- Be net zero by 2050
- Optimize our base business
- Expand low-emissions businesses
- Grow our customer connection
- Achieve world-class ESG performance

## Be a net-zero greenhouse gas emissions company by 2050 and substantially contribute to society's net-zero goals

By 2030, reduce annual emissions by 10 megatonnes across our value chain



Reduce our scope 1 and 2 emissions through base business improvements

Grow low-emissions energy businesses in renewable fuels, electricity and hydrogen to address our scope 2 and 3 emissions

Work with others to reduce value chain emissions, including scope 3

# Reduce emissions in our base business

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 invested significantly in projects and technologies to lower our base business GHG emissions. For example, we deployed leading technologies at our Fort Hills mine that not only improve product value but enhance overall efficiency. The resulting emissions intensity is similar to the typical barrel refined in North America, on a full life-cycle basis.<sup>2</sup> We continue to invest in commercial pilots of in situ solvent technologies that have the potential to lower emissions by 30-70%. We are also on track to deliver a fuel-switching project at our Base Plant mine that will replace petroleum coke with highly efficient gas cogeneration to reduce the emissions associated with our steam production by approximately one megatonne (Mt) per year, along with providing low-carbon power to the Alberta grid that avoids additional emissions of approximately 4 Mt.

Throughout our history of more than 50 years, the oil sands have been at the core of our business and we will continue to produce this resource for decades to come, while improving our sustainability performance along the way. 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,

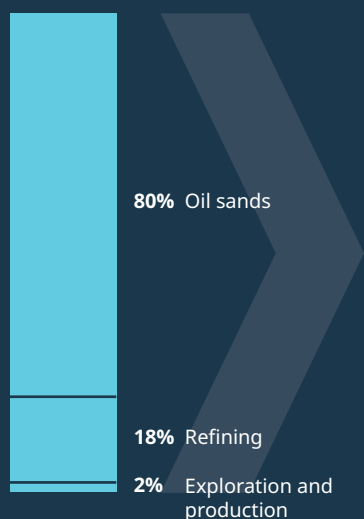
10% with power production, 7% with on-site transport and 5% with energy imports. Carbon capture, use and storage (CCUS) is a commercially available technology that could be used to decarbonize most of these emissions, and we continue to look at other decarbonization options. Fuel switching to low-carbon-intensity fuels could address most of our 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. Following are examples of the technologies and processes that have the greatest potential for base business emission reductions, as well as novel technologies we are exploring.

## Carbon capture, use and storage

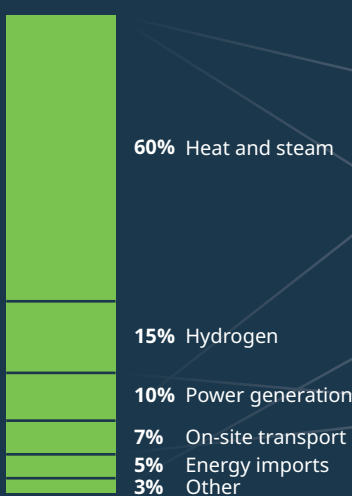
CCUS is a critical technology for meeting global energy and net-zero climate objectives and is recognized by most energy forecasts as key to achieving the goals of the Paris Agreement. CCUS involves capturing and sequestering carbon dioxide (CO<sub>2</sub>) from large point sources or directly capturing it from the air. According to the International Energy Agency (IEA), existing CCUS facilities globally have the potential to capture 40 Mt of CO<sub>2</sub> annually. Over 100 new international facilities were announced in 2021 and 7.6 gigatonnes (Gt) of CO<sub>2</sub> capture

### Suncor's carbon emissions

By segment



By process



Base business reduction opportunities (Scope 1 and 2)

**Carbon capture, use and storage**

**Energy efficiency**

**Fuel switching**

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

2 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

capacity would be needed by 2050 under the IEA's Net Zero Emissions (NZE) by 2050 scenario, of which 50% is from fossil fuels.<sup>3</sup>

Alberta is one of the best jurisdictions in the world for CCUS due to the province's geology and the experience of its oil and gas industry with geological storage. CCUS 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

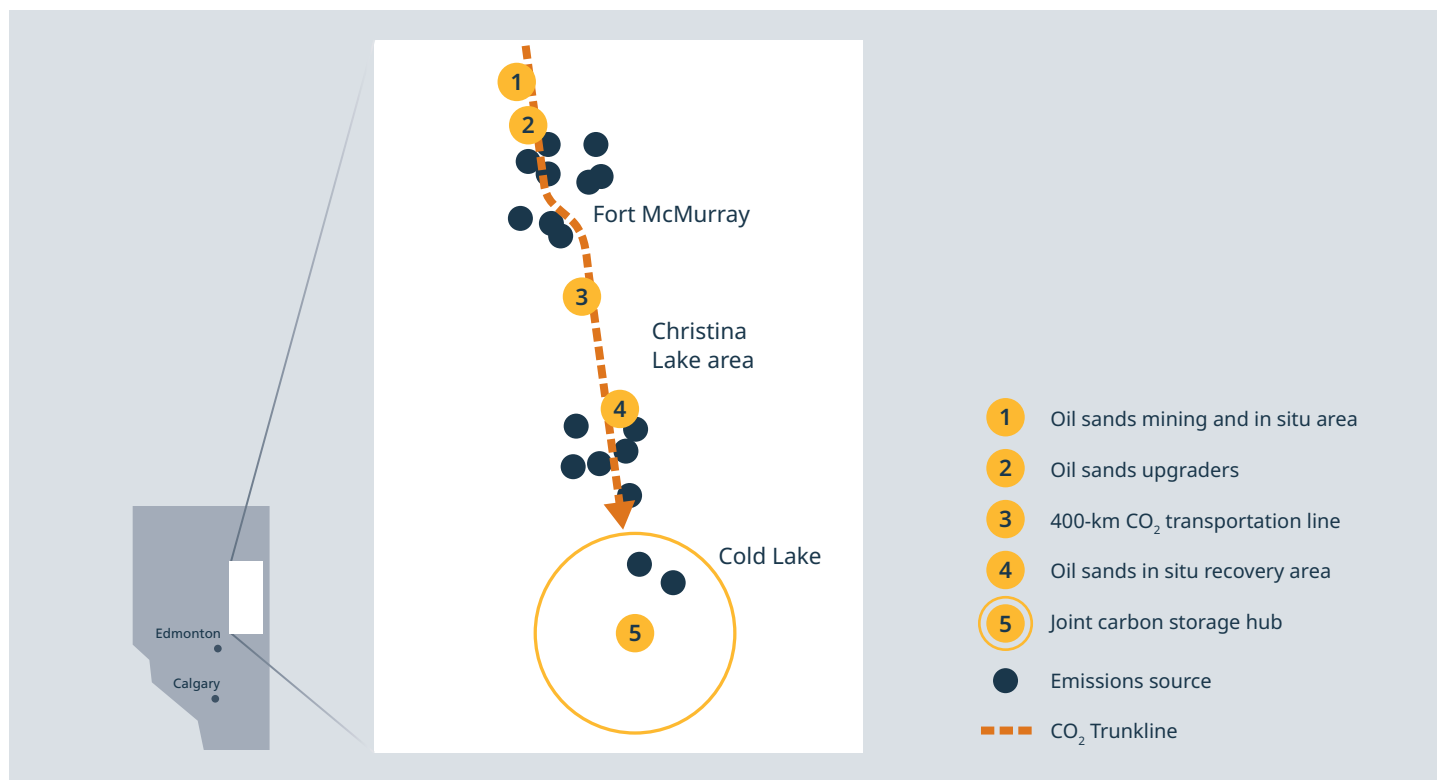
In 2021, Suncor and five other oil sands producers launched the [Oil Sands Pathways to Net Zero Alliance](#), a globally unprecedented collaboration responsible for 95% of Canada's oil sands production, with an objective of net-zero emissions from production by 2050. In June 2022, the Oil Sands Pathways 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. The ambitious objective of the Pathways Alliance producers, supported by the Canadian and Alberta governments, will represent approximately 1% of the CCUS the world needs by 2050 under the IEA's NZE scenario. It is crucial to meeting Canada's climate commitments. 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. It will include a carbon transportation line connecting over 20 oil sands facilities in northern Alberta to a carbon sequestration hub near Cold Lake and be available to other industries interested in capturing and sequestering CO<sub>2</sub>. The Canadian federal budget released on April 7, 2022 included a 50% investment tax credit for CCUS projects. The Pathways Alliance welcomed the news as a critical contribution to our shared goal of net-zero emissions by 2050.

### Svante Inc.

Suncor is an investor in [Svante Inc.](#), which is developing a post-combustion CO<sub>2</sub> capture technology for industrial emissions. Svante's technology separates and captures CO<sub>2</sub> from combustion gas products and concentrates it for industrial use or permanent storage. The capture process uses solid adsorbent materials with very high storage capacity relative to their size, dramatically reducing the time and surface area needed for storage, which reduces costs. This year Suncor is undertaking a technical feasibility study to capture emissions from fluid catalytic crackers at the Edmonton Refinery, to inform further economic and technical evaluation for deployment. Suncor's investment supports Svante in accelerating the commercial-scale deployment of a technology

### Pathways Alliance proposed carbon sequestration hub



3 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](#).

## Reduce emissions in our base business

that can be applied at most of our facilities, at a significantly lower cost than conventional CO<sub>2</sub> capture systems for contaminated or difficult-to-capture CO<sub>2</sub> streams.

### Fuel switching

Fuel switching is substituting a higher GHG-intensive fuel with a lower GHG-intensive one, such as substituting coal and coal-fired power plants with hydrogen or natural gas to generate electricity through cogeneration.

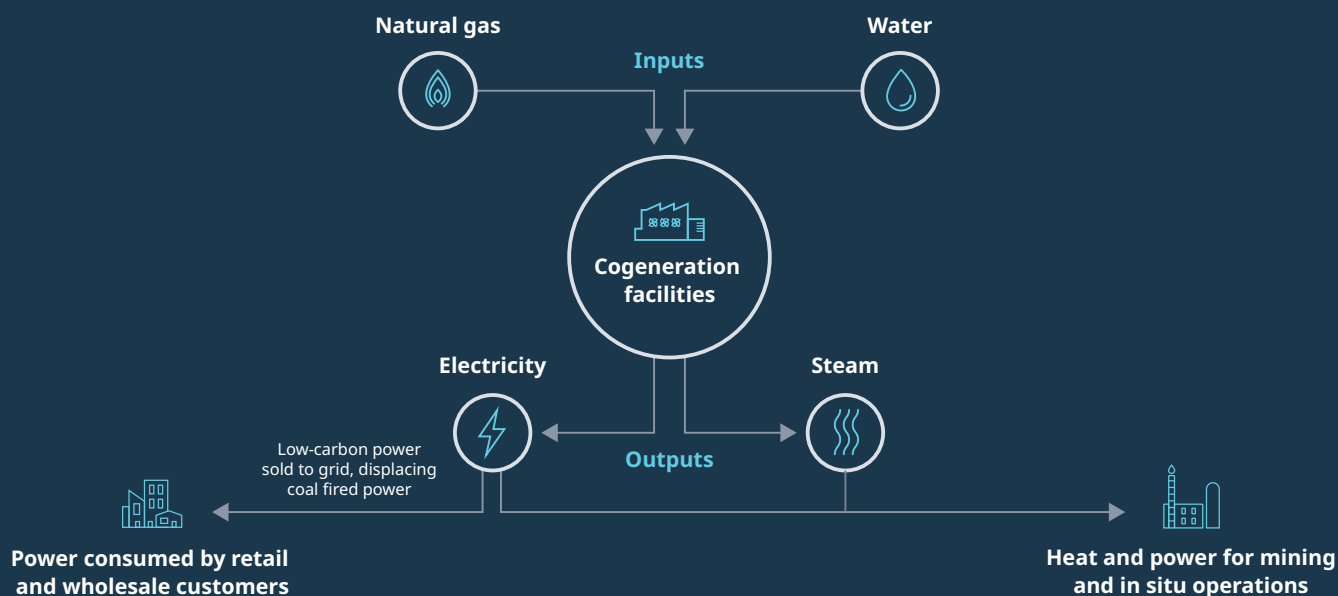
### Cogeneration

Cogeneration is the process of producing both steam and electricity through a natural gas-fuelled process. All our oil sands facilities use cogeneration technology to meet our steam and electricity needs and our Base Plant Cogeneration project will convert the petroleum coke-fired boilers at Oil Sands Base Plant to cogeneration units, a great example of a fuel-switching application. It will not only replace petroleum coke with lower-carbon natural gas but also export electricity to the provincial grid, displacing coal with natural gas to power Alberta homes and businesses. The Base Plant Cogeneration project is expected to be commissioned by late 2024 and will result in approximately 1 Mt per year of direct scope 1 and 2 emission reductions. Additional benefits of approximately 4 Mt from the export of low-carbon power are discussed on [page 11](#).

## Process optimization, energy efficiency and improved reliability

Efficient use of our resources is closely tied to operational excellence and is one of our strategies to reduce base business emissions. For Suncor, operational excellence means operating in a way that is safe, reliable, cost-efficient and environmentally responsible. This improves efficiency by reducing downtime and enhancing asset integrity and reliability. In 2021, Suncor expanded the Mining and Upgrading development team to dedicate resources to energy efficiency and GHG reduction, integrating environmental performance improvement into plant sustainment and optimization. A team of subject matter experts at Suncor manages a portfolio of initiatives to improve production efficiency, reducing energy requirements as well as costs. These initiatives include replacing aging assets with modern designs; digital enhancements such as advanced process controls and optimizers; new chemistry aids; additive manufacturing for process optimization, including improved reliability; simple process reconfiguration; and steam, boiler feedwater and heat integration to maximize steam generation efficiency. At Syncrude, a cross-functional technical team is responsible for identifying, assessing and implementing efficiency opportunities. This has resulted in a suite of projects to drive operational efficiencies that could

### Cogeneration process



Benefits from the cogeneration project are made up of fuel switching (petroleum coke to natural gas, approximately 1 Mt CO<sub>2</sub>e) and low-carbon power exports (the difference between cogeneration power intensity and coal power intensity, approximately 4 Mt CO<sub>2</sub>e).



## Reduce emissions in our base business

potentially reduce GHG emissions by a half-million tonnes annually and could include enhancements to Syncrude's recycled water system. Another example of operational excellence is Syncrude's real-time GHG performance tracker tool that facilitates discussions with plant operators on how to improve energy efficiency.

### Solvent, SAGD efficiency and heat-recovery technologies

#### SAGD enhancement processes

Steam assisted gravity drainage (SAGD) enhancement processes include the use of solvents and reduced pressure for in situ bitumen recovery and have the potential to lower costs, reduce the steam-to-oil ratio and lower GHG emissions by up to 30%. The Enhanced Solvent SAGD (ES-SAGD) process 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. In late 2022 we are planning 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. In early 2021 we initiated a two-year pad-scale pilot project at Firebag to evaluate the effectiveness of the ELITE process.

#### 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 70%. These technologies could include solvents paired with wellbore heating, super heating or electromagnetic heating, with the addition of steam. We expect to launch a pilot project to evaluate solvent-dominated technology by early 2023.

#### In situ heat recovery

Over the past two decades, the SAGD process has pumped heat into the ground to produce bitumen, transforming Canada's in situ oil sands into the world's largest human-made "battery." We can harness this energy by using geothermal technology in our existing mature, shallow wells and recycled water from our base operations and tailings ponds to recover and repurpose the heat. This process would generate reliable base-load electricity with zero carbon emissions and enhance bitumen recovery, while managing process and/or tailings water and accelerating the reclamation of tailings ponds. The thermal energy from just one SAGD well can produce enough electricity to power 3,600 homes for a year and Suncor has hundreds of such wells. We are currently advancing the Heavy Oil Late Life Energy Recovery (HOLLER) project and have received regulatory approval to plan and initiate a pilot at our MacKay River in situ facility.



#### Non-aqueous extraction

Through collaborative partnerships with research organizations and other major oil sands producers, we are pursuing new technologies that improve efficiency and reduce the need for water in bitumen extraction from mining operations. Currently, hot water is used to separate bitumen from oil sands mined ore. By replacing the use of hot water with a solvent, we could significantly reduce water usage and recover bitumen without producing waste tailings ponds. We anticipate this would accelerate land reclamation and reduce land footprint, tailings management costs and fugitive emissions. Earlier this year, we executed a joint development agreement to collaborate and collectively progress non-aqueous extraction technology.

#### Bitumen processing

##### Partial upgrading

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 Suncor's Fort Hills mine, 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. Through the Partially Upgraded Reduced Energy program, Suncor is focused on de-risking other partial upgrading technologies for eventual commercial deployment.

## Expand low-emissions businesses

Suncor is well positioned for energy system expansion, built on our experience growing and operating complementary businesses like low-carbon power and ethanol. Our expanded energy offerings will be in business lines we understand well – low-carbon power, renewable fuels and hydrogen – and they will focus on key value drivers, leveraging existing expertise, complementing our integrated business and connecting to the energy consumer.

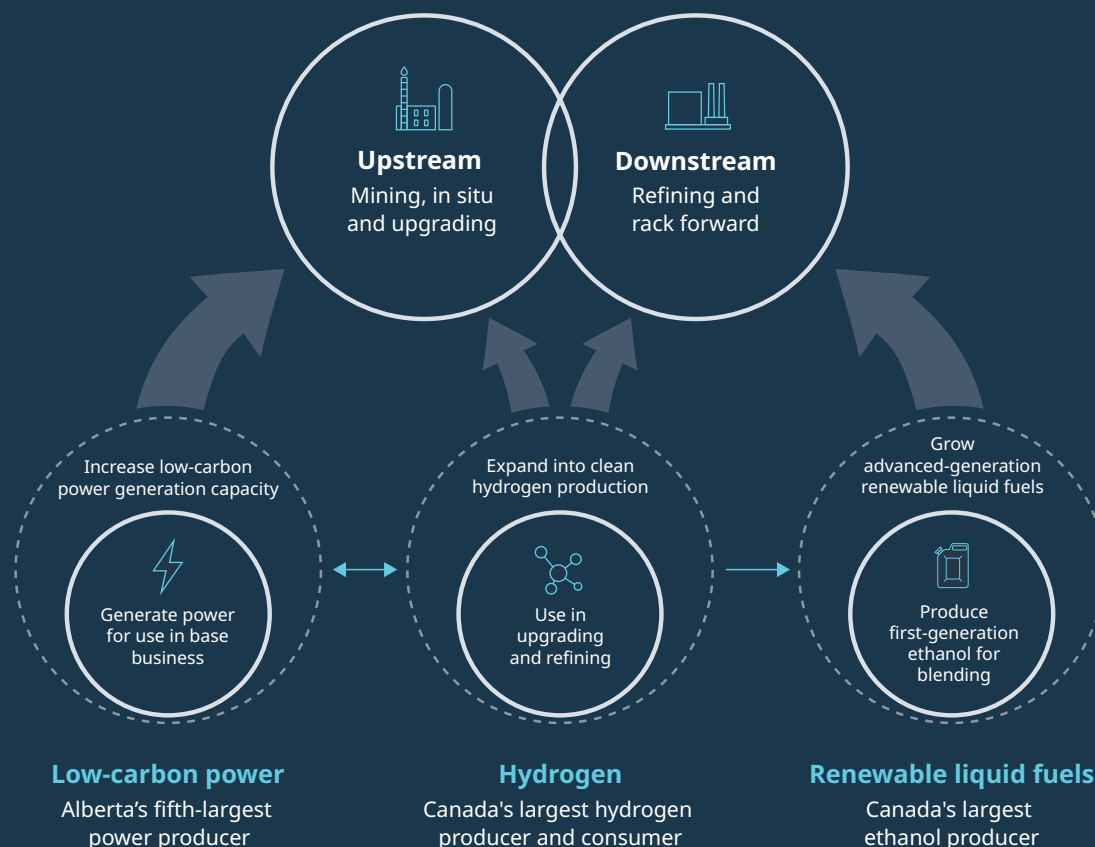
Our plans include:

- allocating approximately 10% of our annual capital budget over the medium term (2022-2025) to investments that advance our low-carbon energy offerings
- allocating a significant portion of this capital toward advanced technologies that provide strong, double-digit returns (e.g., Base Plant Cogeneration)
- 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 and advanced generation waste-based feedstocks)

- becoming a producer of new forms of hydrogen before 2030
- increasing our low-carbon electricity capacity and expanding Canada's Electric Highway™.

In April 2022, we announced plans to strengthen our focus on hydrogen and renewable fuels. We plan to divest our wind and solar assets to concentrate on business lines complementary to our base business to accelerate progress toward becoming a net-zero company by 2050.

We have a clear vision of where Suncor has a competitive advantage within energy system expansion. We look forward to continued collaboration with governments to secure regulatory certainty and appropriate fiscal incentives such as the recently announced investment tax credit, in order to proceed. Below we outline our key focus areas for energy expansion, base business diversification and growing our customer connection.



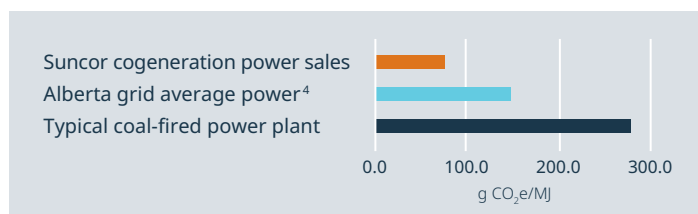
## Expand low-emissions businesses

### Low-carbon power

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

#### Cogeneration

Our cogeneration facilities were initially developed to provide steam and electricity for our oil sands assets. As our cogeneration portfolio evolved, Suncor has become the fifth-largest power producer in Alberta, exporting roughly 40% of the 1,400 megawatts (MW) of electricity we generate. Cogeneration is an optimal replacement for Alberta's coal-fired power plants, which are in the process of being decommissioned, and for backing up intermittent renewable energies like wind. The GHG intensity of our Base Plant Cogeneration project will be approximately 75% lower than a typical coal-fired power plant and approximately 50% lower than the Alberta power grid average. The project was designed to produce excess electricity and will make it possible to export an additional 800 MW of baseload electricity capacity to Alberta's provincial grid, equivalent to roughly 7% of Alberta's current electricity demand. Following its commissioning in late 2024, we estimate that we'll be the fourth-largest power producer in Alberta. In addition to contributing a rate of return of approximately 20%, the project will reduce GHG emissions by 5 Mt per year compared to coal-derived power, equivalent to displacing over one million vehicles on the road today.



#### Renewable power

Suncor played a pivotal role in developing and maturing the Canadian wind energy industry. In 2002, along with partner Enbridge, we built one of the first utility-scale wind farms in Canada. Since then, Suncor has developed eight wind power projects in three provinces. Today, we are a partner in four wind power facilities located in Alberta and Ontario, with aggregate capacity of 111 MW. Additionally, we are in the process of developing and bringing to market phase one of the Forty Mile power project in southeastern Alberta, representing 200 MW of wind capacity. As noted previously, our plan is to divest these assets within the next year. Moving forward, Suncor will continue to participate in many aspects of the electricity value chain, including producing power through its integrated cogeneration operations, power marketing and trading, providing customers with electric vehicle charging and potentially procuring renewable power through power purchase agreements.

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 the end-use combustion, greatly reducing their emissions intensity on a life-cycle basis compared to conventional fuels. Suncor's renewable fuel technology development is aiming to further improve the life-cycle emissions of biofuels by improving feedstock sourcing, processing and transport.

### Renewable fuels

We started producing renewable fuel in the early 2000s at our ethanol plant in St. Clair, Ontario, Canada's largest. Today, we produce approximately 400 million litres per year of ethanol to help meet blending requirements throughout our 1,700 Petro-Canada™ retail stations and elsewhere. The focus of future investments is to meet increasing renewable fuel mandates and leverage new technologies to provide a leading edge in the growth of renewable fuel demand globally. There is a significant opportunity to satisfy this demand and generate 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 biofuel technologies that create ethanol and methanol from waste streams such as non-recyclable municipal waste, industrial forestry and agricultural waste biomass. We have invested in leading biofuels companies and continue to progress a handful of key projects, designed to be readily scalable and replicable to take advantage of emerging growth opportunities, subject to attractive economics. These investments are critical to developing cost-effective ways to meet future blending requirements while keeping Suncor at the forefront of technology and helping to meet our GHG objectives.

#### Enerkem

[Enerkem](#) manufactures biofuels and renewable chemical products derived from waste streams that would otherwise be sent to a landfill. As an investor in Enerkem, we helped with financing as well as seconding Suncor employees to its Edmonton facility, which uses non-recyclable and non-compostable household waste to produce biomethanol and cellulosic ethanol. We are also invested in Enerkem's renewable fuels facility in Varennes, Quebec, which will use non-recyclable commercial and industrial waste and forest residue to produce biofuels and renewable chemicals. The Varennes facility will use green hydrogen in the process, powered by what will be one of North America's largest electrolyzers.

<sup>4</sup> Government of Alberta, "Alberta Carbon Offset Emissions Factors Handbook, Version 2.0, November 2019. Available [online](#)."

## Expand low-emissions businesses

### LanzaTech

[LanzaTech's](#) carbon recycling platform uses novel gas fermentation technology to convert carbon-rich off-gas or waste gas into fuels and chemicals. For over 10 years, Suncor has partnered with LanzaTech to support the development of their patented technology portfolio for potential deployment within our existing operations and advanced-generation biofuel plants. LanzaTech filed to go public in March 2022.

### Lanzajet

[Lanzajet, Inc.](#) is focused on producing sustainable aviation fuel (SAF) and renewable diesel using ethanol derived from waste. Suncor is a founding equity investor in Lanzajet, alongside Mitsui & Co. and LanzaTech, with follow-on investments from Shell and British Airways. Lanzajet's commercial biorefinery in Georgia, U.S. will produce 38 million litres per year of sustainable fuels, primarily SAF. This is the first of many such planned facilities that will help unlock sustainable and economical fuels for the aviation sector. Suncor will market approximately half of the SAF and renewable diesel produced at the facility to jet fuel and distillate customers. Construction of the facility is underway, with production slated for the second half of 2023. As a founding investor, we committed to building a Suncor-operated commercial production facility in North America, which could be operational as early as 2025. We recently

launched a feasibility study for a 227 million litres per year SAF production plant, which is in early engineering and design phases and is expected to provide a mid-teen return on investment.

### Low-carbon ethanol

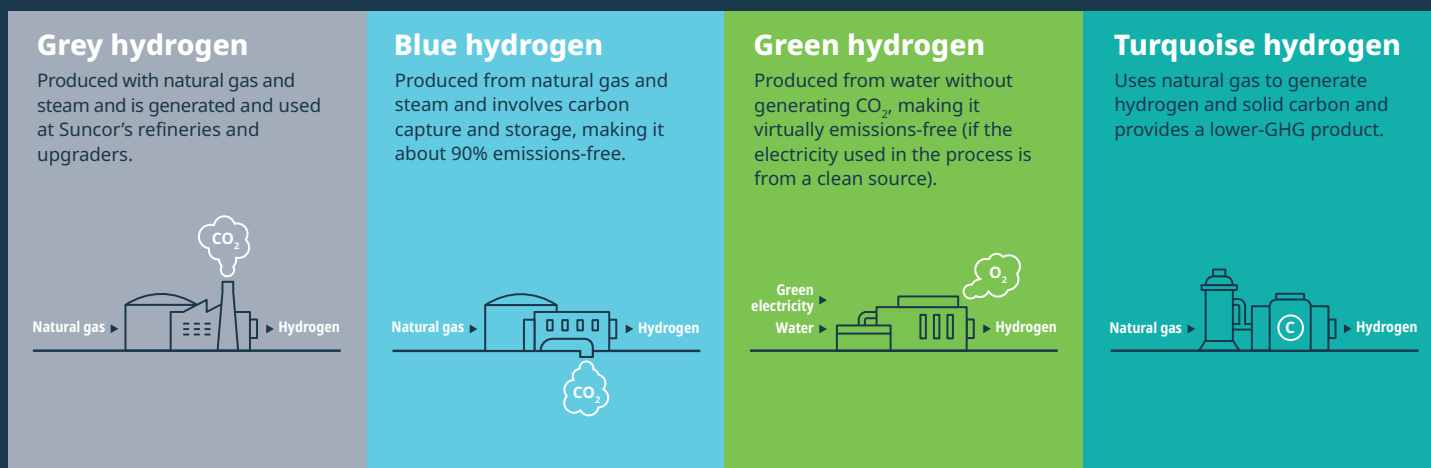
In partnership with Alberta-based forestry organizations, Emissions Reduction Alberta, Alberta Innovates, the Government of Canada and LanzaTech, we are advancing a pilot project to convert woody biomass into renewable ethanol through the gasification of the biomass into syngas and the fermentation of the syngas into ethanol. Construction of a pilot facility in the Edmonton, Alberta area was completed in early 2022 and testing has begun, focusing on improving economics through increased ethanol yield and reduced capital costs.

### Hydrogen

Suncor is one of the largest producers and consumers of hydrogen in Canada, accounting for approximately 15% of supply and 20% of demand. 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 use of hydrogen, we're well positioned to decarbonize our own feedstock and provide an alternative low-carbon fuel to other operators. Hydrogen – including blue, turquoise and green

## Types of hydrogen

Our more than 50 years of experience is guiding us as we expand our hydrogen business, reducing our emissions and growing the clean energy market.



## Expand low-emissions businesses

hydrogen technologies – could play a meaningful role in future energy supply for 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 create hydrogen as well as carbon dioxide, which is captured and stored. In May 2021 we announced a partnership with ATCO Ltd. to study the economic feasibility of a 300,000 tonnes per year blue hydrogen plant near our Edmonton refinery. By capturing and sequestering over 90% of the emissions generated in the production of hydrogen and using 65% of the hydrogen in our refining and cogeneration processes, refinery emissions would be reduced substantially. ATCO would blend approximately 20% of the hydrogen with Alberta's natural gas distribution system, lowering the carbon intensity of natural gas consumption. The remaining 15% of hydrogen would be made available to meet current industry demand and growing demand in municipal and commercial transport markets. Initial estimates suggest the project has the potential to reduce emissions by more than 2 Mt per year and generate substantial economic benefits. A sanctioning decision could be made as early as 2024, which would support commercial operation by late 2027.

### Green hydrogen

Suncor recognizes that different technologies will be required in different jurisdictions. In regions with very low-carbon-intensity sources of electricity supply, ample water and where geology is not conducive to carbon sequestration, electrolysis may emerge as the preferred technology. Electrolysis involves splitting water into hydrogen and oxygen using renewable electricity. Suncor is in the early development phase of a 100 MW electrolysis project with Enerkem and other partners in Varennes, Quebec and in the early stages of evaluating other potential projects ranging from 1 MW to 20 MW in size.

### Turquoise hydrogen

Suncor is evaluating a range of hydrogen production technologies that could further reduce the cost and emissions associated with hydrogen production and unlock new use cases and markets. One area of interest is turquoise hydrogen, whereby natural gas is decomposed via 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 and asphalt. Turquoise hydrogen has the potential to be a low-cost, low-carbon alternative to hydrogen production, especially in regions with

access to clean power and where CO<sub>2</sub> storage is not available. Suncor has partnered with KWI Polymers Solutions to de-risk and scale up its novel hydrogen technology to a field demonstration that could produce 1,000-1,500 tonnes per year of hydrogen and 3,000-4,500 tonnes of black carbon. In early 2022 the project was selected by the Clean Resource Innovation Network for \$10 million in funding. If proven and deployed at commercial scale, a facility producing 100,000 tonnes of hydrogen per year could reduce emissions by approximately 1 Mt per year. Earlier this year Suncor also partnered with Australia-based Hazer Group and FortisBC to begin development of a 2,500 tonnes per year turquoise hydrogen facility, in which Suncor would play a leading role in engineering, construction and eventual operation.

### Hydrogen for transport

We are evaluating opportunities for hydrogen to decarbonize heavy-duty transport and to grow demand for hydrogen as a transportation fuel. We are part of the Alberta Zero Emissions Truck Electrification Collaboration project, a multi-party effort to design, manufacture and test long-range hydrogen-powered trucks operating between Calgary and Edmonton. This 18-month pilot with our partners is a first step to developing economically viable commercial hydrogen transport fuelling stations. Suncor is developing two hydrogen refuelling stations as part of this project.

## 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-combustible product derived from bitumen with extremely low life-cycle GHG emissions. Parts of bitumen – specifically the asphaltenes – are an inexpensive, abundant and reliable feedstock for producing carbon fibre, making it one of the highest-value opportunities for economic diversification of the oil sands. Carbon fibre is also a byproduct of certain methods of hydrogen production Suncor is currently exploring. Carbon fibres are very safe to transport. Suncor has established a technology development program to evaluate converting portions of bitumen, starting with asphaltenes, to general purpose, activated and high-performance carbon fibre. Our current focus is 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, Suncor can influence the GHG profile of its 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. Consumer options are increasing, from traditional internal combustion engine vehicles to hybrid vehicles, battery electric vehicles and hydrogen fuel cell vehicles. While liquid fuels blended with first-generation biofuels comprise the bulk of transportation energy today, electric vehicle infrastructure, advanced-generation renewable fuels and hydrogen fuel are all expected to grow. As transportation options and infrastructure evolve, we will expand low-carbon offerings through our wholesale business, Petro-Canada™ retail brand and established relationships with millions of PetroPoints™ customers. We will do this by:

- working with governments to develop fuel standards that provide affordable, low-carbon energy options for consumers
- growing our renewable fuels business to support increasing wholesale and retail demand
- expanding our hydrogen capacity to offer transportation solutions as demand increases
- expanding our coast-to-coast Electric Highway™ of 57 charging stations.

For example, as a member of the Canadian Council for Sustainable Aviation Fuels, Suncor is currently working with domestic and international airlines to explore the provision of sustainable fuels as part of our strategy to operate production facilities in North America.

### Collaborate on technology and innovation

The low-carbon energy expansion 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](#) – an industry-led collaboration with academia focused on energy sector innovation and entrepreneurship in the energy transition, sponsored by Suncor since 2021
- [Canada's Oil Sands Innovation Alliance \(COSIA\)](#) – an alliance of Canada's largest oil sands producers working to advance technologies and improve environmental performance in the oil sands, including GHGs, by combining expertise and sharing intellectual property; as a sponsor of the NRG COSIA [Carbon XPRIZE](#), a global competition for funding technologies that can transform CO<sub>2</sub> into valuable and useful products, COSIA is also

helping other sectors and industries – the prize was awarded in April 2021 to two companies that are aiming to decarbonize concrete production

- [Canadian Council for Sustainable Aviation Fuels](#) – an organization launched in February 2022 to bring together key industry and government stakeholders to accelerate the commercial deployment of low-carbon SAF in Canada
- [Clean Resource Innovation Network](#) – an industry-led group with a vision to make Canada the global leader in producing clean hydrocarbons from source to end use by advancing technologies for application in Canada and abroad
- [Energy Futures Lab](#) – a multi-stakeholder, collaborative forum focused on solving complex challenges at the intersection of social and energy systems
- [Evok Innovations](#) – a \$100-million technology fund focused on enabling entrepreneurs to commercialize clean technologies and market them globally, funded by Suncor and Cenovus Energy; its recently announced Fund II raised an additional \$376 million from new investors to target a suite of technologies that includes CCUS, low-carbon fuels, clean energy and grid innovations, and advanced materials
- [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.



***Achieving leading ESG performance is one of Suncor's objectives, yet the key goal of net-zero emissions isn't assured and it won't be easy. Our engagement and collaboration with diverse partners – governments, customers, Indigenous Peoples, industry partners, communities, investors and lenders – is critical to our future success.***

**Martha Hall Findlay**  
Chief Climate Officer

## Work with others to reduce emissions

### Engage with stakeholders

Engagement and dialogue are essential to developing relationships and understanding diverse perspectives and experiences as we seek common solutions to our shared climate objectives. Stakeholder engagement provides the opportunity to share Suncor's progress and challenges, and to gather and incorporate external perspectives into our strategies and plans. For example, our discussions with Ceres and Climate Action 100+ led to recommendations for Suncor to tie executive compensation to climate objectives, which we implemented. Over the past year, Suncor engaged in multiple climate- and energy- focused meetings, consultations, workshops and conferences with shareholders, regulators, standard-setting bodies and individuals, including the following:

- Canadian Chamber of Commerce
- Canadian Standards Association
- CERA Energy Week
- Chartered Professional Accountants of Canada
- Climate Action 100+
- GLOBE Capital
- GLOBE Forum
- Independent Review Committee on Standard Setting in Canada
- International Emissions Trading Association
- International Petroleum Industry Environmental Conservation Association
- International Sustainability Standards Board
- Sustainable Finance Action Council
- United Nations Climate Change Conference of the Parties (COP)
- World Bank Carbon Pricing Leadership Coalition
- World Economic Forum
- World Petroleum Congress



***We won't make progress by only engaging with people who agree with us. If we retreat from conversations because they are hard, we limit our ability to participate in solutions.***

**Jon Mitchell**

Vice President, Sustainability, speaking at COP26



### Sustainability Network

Suncor is building forums for employees to promote internal engagement and learning opportunities. In 2021, we relaunched the Suncor Sustainability Network to improve sustainability acumen, integration and communication within the company.

### Work with our supply chain

In 2021, we continued to identify baseline risks and opportunities within our supply chain. 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. We have mapped our suppliers globally and are working to better understand sustainability risks and opportunities. We have added a supply chain sustainability risk to our Enterprise Risk Management program to promote the integration of sustainability principles in our supply chain and the identification of risks and opportunities.

Suncor is implementing an innovative approach to managing relationships with strategic suppliers to enable more robust and objective engagement. Through collaboration, innovation and the progression of social and environmental goals, we expect to advance specific objectives with each supplier. Executive-level business and supply chain sponsors, as well as category management professionals, are investing considerable time to engage in these conversations, identify shared objectives and progress them over time.

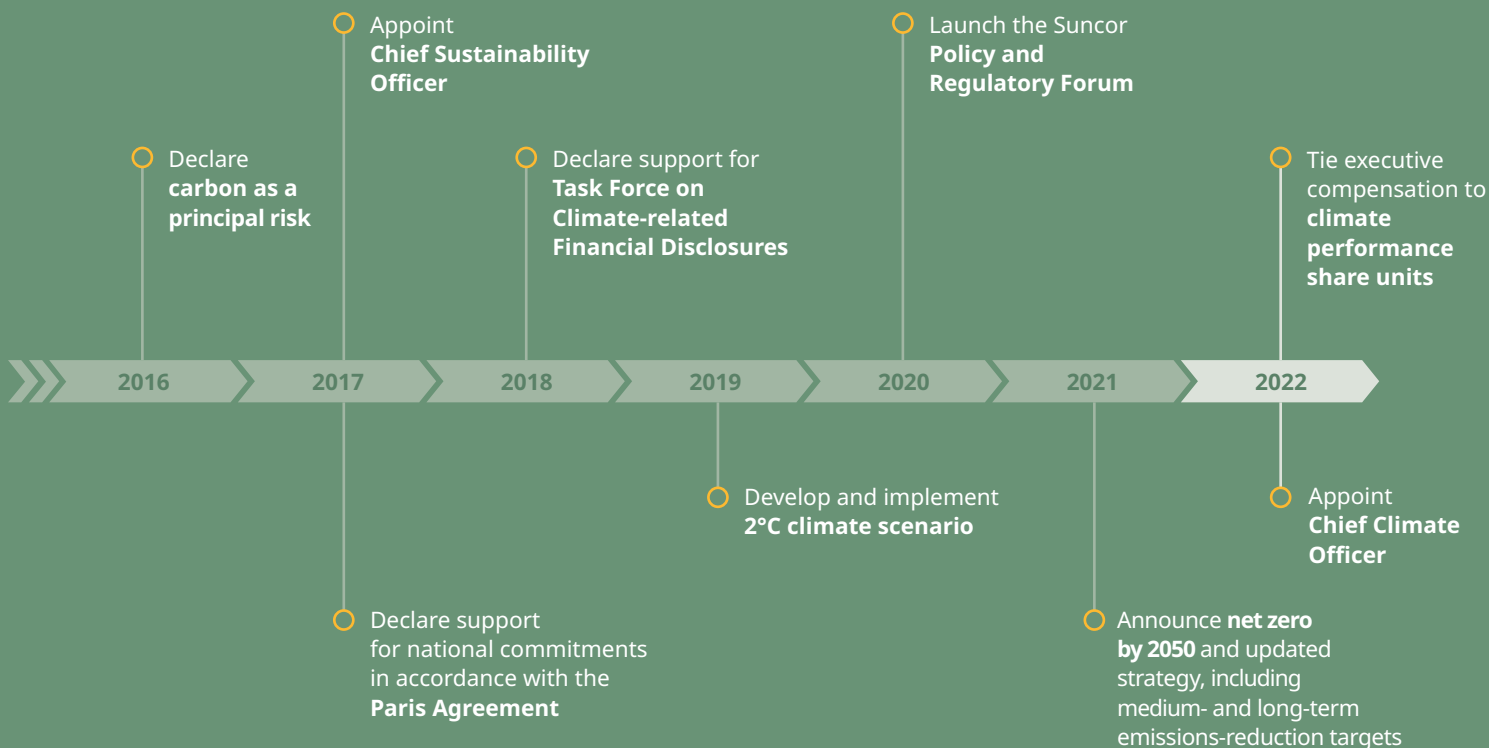


# Governance and risk management

- > Climate governance
- > Risk management

Suncor's strategic objectives include achieving net-zero emissions by 2050, in alignment with the Paris Agreement. This builds on our strong governance, which has recognized carbon as a principal risk to our business since 2016. Our strategic objectives

firmly embed climate risks and opportunities into our business planning and decision-making, enabling effective stewardship and execution of our strategy and continuing a strong track record of sustainability governance.





# Climate governance



Climate risks and opportunities are embedded throughout the organizational structure and processes of both our management and Board of Directors, including strategy development, business planning, project development, risk oversight, scenario analysis, executive compensation, skills development and external engagement. This year, Suncor strengthened the link between corporate greenhouse gas (GHG) performance and executive compensation to better align with shareholder interests. Further information about Suncor's 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 identify 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. In 2022 Suncor reframed its project portfolio development and execution risk to emphasize strategic agility in its journey to net zero, as climate-related risks and opportunities feature more prominently in our business planning and risk management activities. As a board member, Suncor's president and CEO is a key link between management and the board. The CEO keeps the board fully informed of the company's progress toward achieving its climate strategies and objectives and the board evaluates the performance of executive management toward these achievements.

## Chief Climate Officer

This year Suncor created the role of Chief Climate Officer (CCO), the first appointment of its kind in Canada's energy industry. By dedicating more executive leadership to climate and energy, this role creates capacity to provide leadership on climate and energy issues. The CCO plays a critical role in developing and championing Suncor's climate-related strategies, initiatives and positions. The CCO helps advance and navigate climate-related issues within Canada and globally and is a key part of Suncor's strategic planning process, providing essential external context and advice.

## Chief Sustainability Officer

The Chief Sustainability Officer (CSO) integrates climate and sustainability matters into all areas of Suncor's business. Together with the CCO, the role serves as a link to the Environment, Health, Safety and Sustainable Development (EHS&SD) Committee of the board, which stewards carbon risk. The CSO plays a critical role in developing and championing Suncor's sustainability initiatives, positions and strategies, supporting public policy and government engagement, improving Indigenous and stakeholder relationships and collaboration, and navigating the evolving ESG reporting landscape.

Through the CSO and CCO roles, Suncor has elevated critical sustainability issues and climate leadership, underscoring the importance of these issues to our company.

## Climate governance

### Board oversight

#### Strategy and business planning

A key duty of the board is to review and monitor Suncor's purpose and objectives and the plans for achieving them. Suncor's management and the board have an annual meeting dedicated exclusively to strategy. The board reviews Suncor's annual business plans and capital budget, thereby endorsing the strategies reflected in the plans, including Suncor's capital outlook. It tests Suncor's strategy against various climate scenarios, including a two-degree Celsius scenario (2°C). In 2021 Suncor and the board undertook a comprehensive review and update of Suncor's business strategy, resulting in several [strategic objectives](#), including our objective to be a net-zero company by 2050. The EHS&SD Committee reviews and makes recommendations to the board regarding Suncor's ESG-related strategic objectives and progress.

#### 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 strategic objectives. Suncor identified carbon as a principal risk to our business in 2016. Thus, carbon risk is already integrated into many aspects of our business planning and decision-making processes 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. We are reviewing the ownership of this risk to reflect our updated strategy and the addition of the CCO role.

### Executive compensation

Executive compensation plans are a principal component of board oversight and are closely tied to our strategy execution and business and sustainability 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 the company's climate initiatives. By linking long-term executive compensation to climate-related initiatives, we are reinforcing Suncor's objective of attaining net-zero emissions by 2050. 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.

### Skills and experience

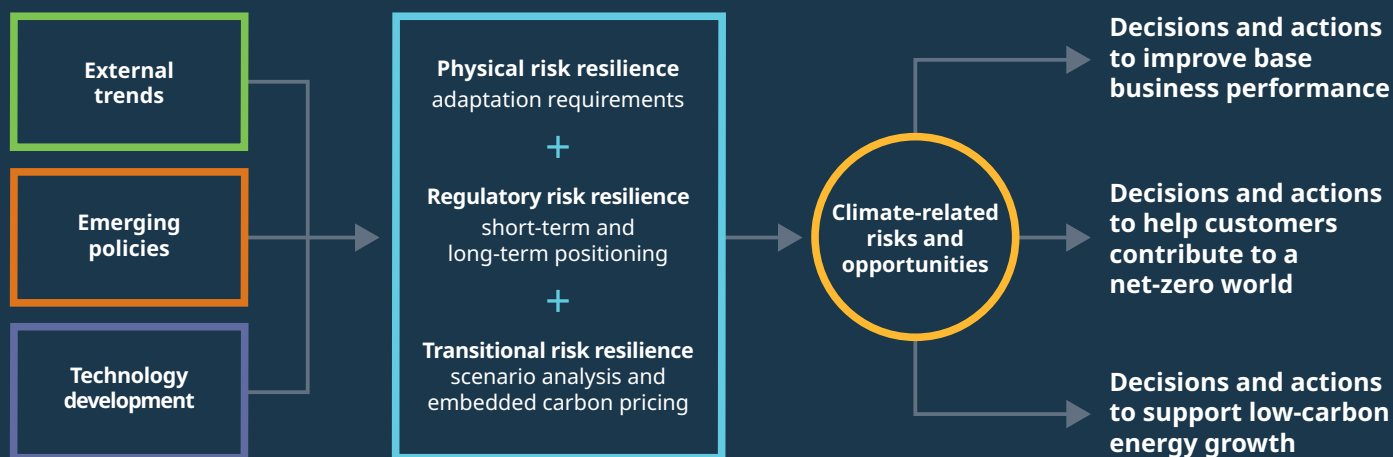
The board recognizes the importance of having the right skills and experience in relation to Suncor's business, including emerging risks and issues, changes to the legal, regulatory or industry environment, and opportunities presented by new technologies. The Governance Committee maintains and updates 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 extensive 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 2021, the board, its committees and individual directors participated in presentations and received educational information on a variety of topics, including energy transition and climate, financing the net-zero transition, and oil markets and energy transition.

### External engagement

The board is mandated to ensure that systems are in place for communicating with Suncor's shareholders and other stakeholders. Suncor recognizes the importance of external communication and engagement and regularly participates 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.

# Risk management

## Understanding and integrating climate-related risks and opportunities



Suncor proactively manages an ERM program 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 business scenarios
- annual updates of corporate scenarios and signposts 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 process and before commitment of significant resources
- facility-level GHG emission forecasts to identify risks and optimize business planning
- use of financial and physical contracts to mitigate commodity price risks.

## Transition risk

We consider key transition risks, such as new policies and regulations, evolving market forces and changes in consumer preferences, using four future scenarios and the integration of carbon pricing into strategic plans and capital allocation decisions.

## Policy and regulatory risk

Suncor continuously monitors the policy and regulatory environment to identify emerging risks. Its policy and regulatory forum governs an issues management process to drive enterprise alignment and a disciplined approach to seizing 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 the right work across the company. Some of the issues we are managing and monitoring include carbon pricing and fiscal incentives, renewable fuel mandates, electrification of energy consumption including transportation, the Canadian government's emissions reduction plan and oil and gas sector emissions limit, and market access.

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

## Risk management

change. Our advocacy includes supporting wide-ranging incentives for emission reductions and removals, along with support for the Paris Agreement. Good policy instills confidence in the financial markets, industry and society and promotes economic prosperity which, in turn, enables low-carbon energy expansion and the technology and innovation needed to reduce emissions globally.

We are monitoring and engaging with governments and multilateral organizations as they develop or update federal, provincial, state and global climate policies, including:

- Alberta's Technology Innovation and Emissions Reduction Implementation Act
- British Columbia's Low Carbon Fuel Standard Program
- Canada's Clean Electricity Standard
- Canada's Clean Fuel Regulation
- Canada's Emission Reduction Plan, including the oil and gas emissions limit
- Canadian Net-Zero Emissions Accountability Act
- Canadian Output-Based Pricing System
- Canadian Securities Administrators' "Proposed National Instrument on Disclosure of Climate-Related Matters"
- Colorado's Climate Action Plan
- International Financial Reporting Standards Foundation and the International Sustainability Standards Board
- Newfoundland and Labrador's Management of Greenhouse Gas Reporting Regulations
- Ontario's Emissions Performance Standards
- Pan-Canadian Framework on Clean Growth and Climate Change
- Quebec's Plan for a Green Economy and renewed cap and trade program
- United Nations Paris Agreement
- The United States' increased ambitions and evolving climate policies
- US Securities and Exchange Commission's "Enhancement and Standardization of Climate-Related Disclosures for Investors"

More information about climate-related policies, risks and their regulatory impacts may be found in Suncor's [2021 Annual Information Form](#).

## Carbon pricing

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 scenarios to develop multiple price assumptions for a variety of economic variables, including carbon price. Carbon price assumptions and forecasts are based on current and emerging regulations and are applied to our assets based on anticipated impacts to different facilities, using a bottom-up approach. The Canadian government has stated that the carbon price on industrial emitters will increase to \$170 per tonne by 2030. In addition, Canada's Emission Reduction Plan (ERP), released in April 2022 but still subject to consultations, projects a 42% reduction in oil and gas GHG emissions by 2030, compared to 2019 levels. Suncor continues to consult with the federal government to align the ambitious net-zero reduction plans announced by Suncor and the Pathways Alliance with the ambition outlined in the proposed ERP.

All of Suncor's upstream emissions and approximately 80% of our refinery emissions are subject to carbon pricing, which sends a strong signal to manage emissions across our business. Suncor applies carbon prices to its scope 1 and 2 GHG emissions on a working-interest basis for its upstream and downstream business and provides an estimated cost per barrel to illustrate the relative impact of carbon policies. The estimated 10-year average, before-tax<sup>5</sup> cost of carbon is \$0.64<sup>6</sup> per barrel for our upstream net production and \$0.41<sup>7</sup> per barrel for our downstream saleable yield. Our compliance costs reflect regulatory design and actions we've taken to reduce emissions, such as our low-carbon investments. Emission performance credits from cogeneration power exports, representing a regulatory compliance benefit, are included in the upstream cost estimate, while the benefits from our renewable power projects are not currently reflected in the upstream or downstream estimate. In 2021, Suncor's cogeneration and wind facilities that operated better than regulatory benchmarks generated approximately 0.6 Mt of emission credits. These benefits may be used for compliance purposes to reduce costs and may be banked for future years. Regulations 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 all global carbon-pricing regimes and prevents trade-exposed industries such as oil and gas from relocating to jurisdictions without carbon pricing.

5 In previous climate reports, Suncor reported the carbon cost per barrel as an after-tax calculation. In 2021 these values were \$0.46 per barrel for our upstream net production and \$0.38 per barrel for our downstream saleable yield. Starting this year Suncor is presenting the cost of carbon per barrel as a before-tax calculation to conform with Generally Accepted Accounting Principles.

6 In 2020 the actual before-tax cost was \$0.12 per barrel for our upstream net production, with a carbon price of \$30 per tonne.

7 In 2020 the actual before-tax cost was \$0.04 per barrel for our downstream saleable yield, with a carbon price of \$30 per tonne.

## Risk management

### Climate scenarios

We use three energy future scenarios to 2050 and a 2°C scenario to 2100 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 three energy future scenarios to 2050 are updated annually and use variables adjusted in a consistent manner, including demographic, economic, environmental, geopolitical, legal, social, cultural and technological factors. As science has progressed, the Paris Agreement, which sets out a global framework to avoid dangerous levels of climate change, has set a goal to “limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.”<sup>8</sup> Suncor supports the Paris Agreement and in 2022, we are reviewing 1.5°C scenarios to further test the resilience of our business strategy.

Our 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.

#### Scenarios to 2050

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

### Autonomy<sup>9</sup>

Revolutionary change in societal and political attitudes toward energy, climate and the environment drives the transformation to a low-carbon economy

- Pressure from stakeholders continues to push companies and governments toward faster action on ESG measures.
- Greater international co-operation ensures sufficient progress on climate change.
- Free and open markets in a technology-driven economy are strongly intertwined with climate change action.
- 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.

#### Indicative signpost that points to Autonomy

- In Canada, provinces and the federal government have improved the level of climate change co-operation as public concern for climate action continues to grow and political platforms converge on climate issues.

#### Energy markets impact

- Oil is still required for decades to come, but its share of energy demand declines over time as economic growth becomes less oil-intensive.
- Natural gas demand remains steady, overtaking oil as the largest source of global non-renewable energy by the end of the scenario period.
- Renewable power generation becomes the largest source of energy by the end of the period to meet growing electricity demand.
- Biofuels and biomass demand nearly doubles, replacing a share of decreasing fossil fuel use.
- Production of low-carbon hydrogen grows as technologies for its use also improve.

#### Expected impact on Suncor

- Some producing upstream assets may be retired before the end of their producing life.
- Base business is sustained and optimized, providing stable cash flow to support shareholder returns and fund growth of expanded low-carbon energy businesses (renewable fuels, electricity and hydrogen).
- Only top-tier refineries globally remain profitable – Suncor’s downstream maintains a focus on reliable, efficient, low-carbon and low-cost operations.
- Collaboration to reduce emissions accelerates (e.g., Pathways Alliance).

<sup>8</sup> United Nations Framework Convention on Climate Change, “The Paris Agreement,” 2022. Available [online](#).

<sup>9</sup> The Suncor scenarios (Autonomy, Rivalry, 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 July 2021. Suncor’s scenario names are independent of and should not be confused with any current or vintage IHS Markit Energy and Climate Scenarios with these same names.

## Risk management

### Rivalry<sup>9</sup>

Population growth, urbanization and a growing middle class drive energy demand. Diverse sources of supply are required to satisfy demand, with intense competition for market share between energy sources.

- A mix of social, market and government forces drives fundamental changes in energy use and emissions pathways, but realization of climate goals remains limited.
- Politics and fiscal challenges constrain governments and inhibit co-operation.
- The marketplace often outpaces the government in driving change and investment.
- Energy transition accelerates but moves in different ways and at different speeds around the world.
- Citizens' conceptual aspirations to address climate change increase but support is fickle, with limited willingness to bear the full financial and social costs associated with realizing governments' climate change ambitions.

#### Indicative signpost that points to Rivalry

- Growing pressure to reduce absolute emissions, enhanced public discourse and competition to secure clean energy supply chains drives climate policy forward; however, co-ordinated global climate change action remains stalled.

#### Energy markets impact

- Energy mix evolves gradually and steadily – fossil fuels still dominate by 2050, but oil and coal lose ground to cleaner-burning natural gas and renewables.
- Oil demand stays largely flat during the scenario period.
- Natural gas demand growth is supported by abundant supply and policies favouring its lower carbon intensity over oil and coal.
- Renewables expand globally, enabled by coal-constraining policies in favour of cleaner power generation options.
- Hydrogen demand increases steadily.

#### Expected impact on Suncor

- Existing upstream assets are retired at their normal end of producing life.
- Higher prices and stricter emissions policies incentivize new technologies to lower our cost and carbon footprint.
- Competitive downstream provides robust returns and more aggressive investment in low-carbon fuels and electricity.
- Collaboration to reduce emissions continues, albeit at a more measured pace than in the Autonomy scenario.

### Discord<sup>9</sup>

Political instability and nationalistic tendencies inhibit governments, cause market uncertainty and slow the energy transition.

- Environmental progress and climate change mitigation weakens in the face of constant economic concerns and political and market instability.
- Chronic economic crises make governments short-term focused, insular and confrontational in international affairs.
- The global supply chain breaks down, raising the cost of living for the emerging middle class.
- Decarbonization efforts continue in some key sectors and countries, but the scale and pace are insufficient to significantly alter global emissions growth.
- Global GDP growth falters with the weight of debt burdens, lack of financing availability and the inability of governments to generate growth.

#### Indicative signposts that point to Discord

- Heightened focus on national energy security, self-interest and protectionism as evidenced by Russia's invasion of Ukraine.
- Continued tension between the U.S. and China.
- Rising inflation among global economies.

#### Energy markets impact

- Change in the global energy mix slows; conventional fuels and technologies retain market leadership.
- Slower economic growth limits growth in energy, oil and refined product demand.
- Natural gas demand growth slows due to a constrained global economy and ongoing competition from lower-cost coal and falling-cost renewables.
- Despite continued competitiveness, renewables see less growth compared to Autonomy and Rivalry scenarios.

#### Expected impact on Suncor

- Existing upstream assets may be extended beyond their normal end of producing life.
- High-return energy investments continue to be funded.
- Suncor downstream well positioned to compete, with a focus on reliable, efficient and low-cost operations. Compared to Rivalry, there is less competition expected in both our traditional refined product businesses and low-carbon fuels and electricity businesses.

<sup>9</sup> The Suncor scenarios (Autonomy, Rivalry, 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 July 2021. Suncor's scenario names are independent of and should not be confused with any current or vintage IHS Markit Energy and Climate Scenarios with these same names.

## Risk management

### 2°C scenario

Suncor's 2°C scenario, developed in 2019 with IHS Markit, helps to inform our long-term business planning and corporate strategy and allows us to understand a potential pathway to keeping global temperatures from rising 2°C or less by 2100, compared with pre-industrial levels.

Developing this scenario pushed us to think critically about the characteristics of a plausible, relevant and consistent view of the future. The process was valuable and provided us with several key insights – the need for co-ordinated global action on climate change, the power of carbon pricing and other regulatory incentives to advance low-carbon technology, and the changing energy mix required to power the world's economies amidst a growing population.

#### 2°C

A plausible pathway to keep global temperatures from rising 2°C or less by 2100 compared with pre-industrial levels.

- Peak emissions are reached following a combination of cost and generational pressures, technological innovation and political unity that bring enough of the world together to take dramatic and unified action to change the trajectory of GHG emissions.
- Aggressive emission reductions occur in all sectors and solutions to remove GHGs from the atmosphere are implemented to reduce the total concentration of CO<sub>2</sub>.
- An international alliance with a shared 2°C ambition, along with transparent collaboration in technology, trade and environmental approaches, is established.
- A broad-based price on carbon throughout the economy reduces consumption and incents the adoption and improvement of low-carbon technology.
- In conjunction with carbon pricing, governments implement market-based solutions within the alliance, including open carbon markets to buy, sell and trade offsets across a vast economy.

#### Energy markets impact

- Oil plays a continued, albeit diminished, role to 2100, while renewables and nuclear power become more prominent post-2050.
- In the power sector, the demand for coal faces sustained pressure globally because of its relatively high emissions intensity. Renewables continue to gain market share on improved cost profiles, dedicated policy support and the firm capacity offered by improved storage in the form of hydro, batteries and hydrogen. Nuclear power market penetration increases, given lower costs and new, safer technologies and policies.
- In the transportation sector, the world shifts away from oil. Oil demand in the second half of the century transitions to demand for petrochemical feedstock. The decline is most pronounced in the light-duty vehicle segment where electrification, biofuel and hydrogen supply opportunities grow. The decline is slower in the heavy goods vehicle segment and hydrogen as a transportation fuel grows as costs decrease.

#### Expected impact on Suncor

- Some producing upstream assets may be retired before the end of their producing life.
- We grow our business in renewable fuels, low-carbon power and hydrogen.
- We sustain and optimize our existing hydrocarbon business, reducing its carbon footprint.
- We play an enhanced role in decarbonization through scaling and commercialization, with strong partnerships and collaboration (e.g., Pathways Alliance).

## Risk management

### Scenario signposts

Alongside our scenarios, we annually update signposts and milestones that identify critical shifts in the external context. The world continues to change, often unpredictably. In 2021, the COVID-19 pandemic continued to be a headwind to energy demand recovery, climate ambitions intensified and energy prices in many countries surged due to structural market imbalances, which have been further exacerbated by the Russia-Ukraine war in 2022. Tracking the pace and direction of change is an integral part of our scenario work and helps us develop and evaluate alternate strategies for our business by incorporating both global and Canadian current events, trends and actions.

Signposts include changes in the global energy demand and supply mix, political and economic indicators, climate data, policy and consumer trends, and technology advances. Current signposts tell us:

- There are lags between policy, opportunity and the ramp-up of investment in the energy transition, which alters the pace of the transition itself.
- Increasing nationalism, a focus on energy security and competition to secure supply chains creates a volatile geopolitical and economic environment.
- Large-scale government intervention and spending and inflationary pressures following COVID-19 are increasing the risk of slower growth and social unrest.
- Imbalances in supply and demand for oil, gas and power along with underinvestment in oil and gas increases the risk of price volatility.
- Despite ambitious climate policies taking shape, co-ordinated global action on climate change remains largely stalled.
- Energy security and affordability continue as key variables in global energy demand.

### 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 and operational procedures and maintain insurance for damage to, or loss of, assets.

#### Acute and chronic risk

Physical risks associated with climate change may manifest as 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 have always had 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 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.

Weather and weather-related event impacts and mitigations specific to Suncor's operations are detailed in the table, *Physical risks, impacts and mitigations*.

The Commerce City Refinery, owned and operated by our U.S. subsidiary Suncor Energy (U.S.A) Inc., is in a region that is classified as having a moderate risk of water stress, where curtailment of water supply would require bringing in water by pipeline or truck.<sup>10</sup> Water management is a priority at Suncor, driving industry-leading innovation at our facilities to reduce, recycle, reuse and return water.

### Financial risk

Over the last decade, Suncor experienced unexpected costs in response to the 2013 floods in Calgary, Alberta and the 2016 wildfires in Alberta's Fort McMurray region, including lost revenue from business interruption. These risks and outcomes were incorporated into Suncor's ERM system to inform future business planning. 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.

<sup>10</sup> Per the World Wildlife Fund's Water Risk Filter tool and the World Resources Institute's Aqueduct Water Risk Atlas. These tools evaluate overall physical, regulatory and reputational risks at the watershed level and indicate that the Commerce City Refinery in Colorado exists within a "medium-high" water stress region of the Mississippi River Basin.



## 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"> <li>• Co-ordination with local fire protection services and the use of fire breaks in areas with higher risk of wildfire; manage facilities in line with FireSmart guidance</li> <li>• Develop additional water sources and recycling plans for water-dependent facilities, such as oil sands mining and in situ</li> <li>• Protocols for working in severe weather</li> <li>• Considering physical risks as part of infrastructure design and facility management</li> <li>• Continuous weather tracking service to monitor storm systems</li> <li>• Continuous monitoring system to track icebergs and regular flyovers to map movement; if an iceberg poses a threat, we work to either alter its direction or enact an emergency response to move assets to safer water</li> </ul>
	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; minimal use of piers and docks to support our offshore operations.	<ul style="list-style-type: none"> <li>• Robust emergency response plans and business continuity plans to help staff prepare and manage weather events</li> <li>• Continuing to improve water recycling rates at our facilities and reducing overall water use by advancing solvent-based and non-aqueous bitumen extraction at our mining and in situ operations</li> <li>• 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</li> </ul>
	Baseflow change in streams	While short-term droughts can be suitably managed, long-term changes in streamflow 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.	



# Metrics and targets

- > GHG objectives
- > GHG emissions

Guided by our strategy, Suncor is focused on reducing base business emissions and optimizing current assets, while investing in the development and deployment of new technology. Technology and innovation have the potential to deliver step-change

improvements in emissions reductions, but it will take time for the required investments and infrastructure to be developed and deployed at a commercial scale.

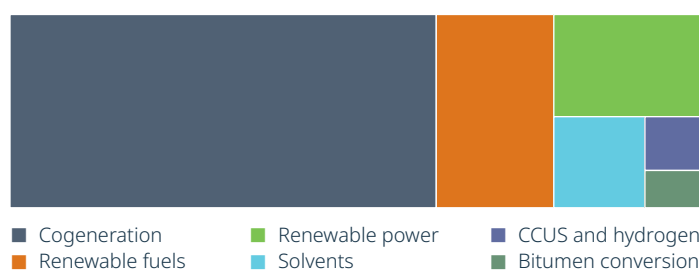


# GHG objectives

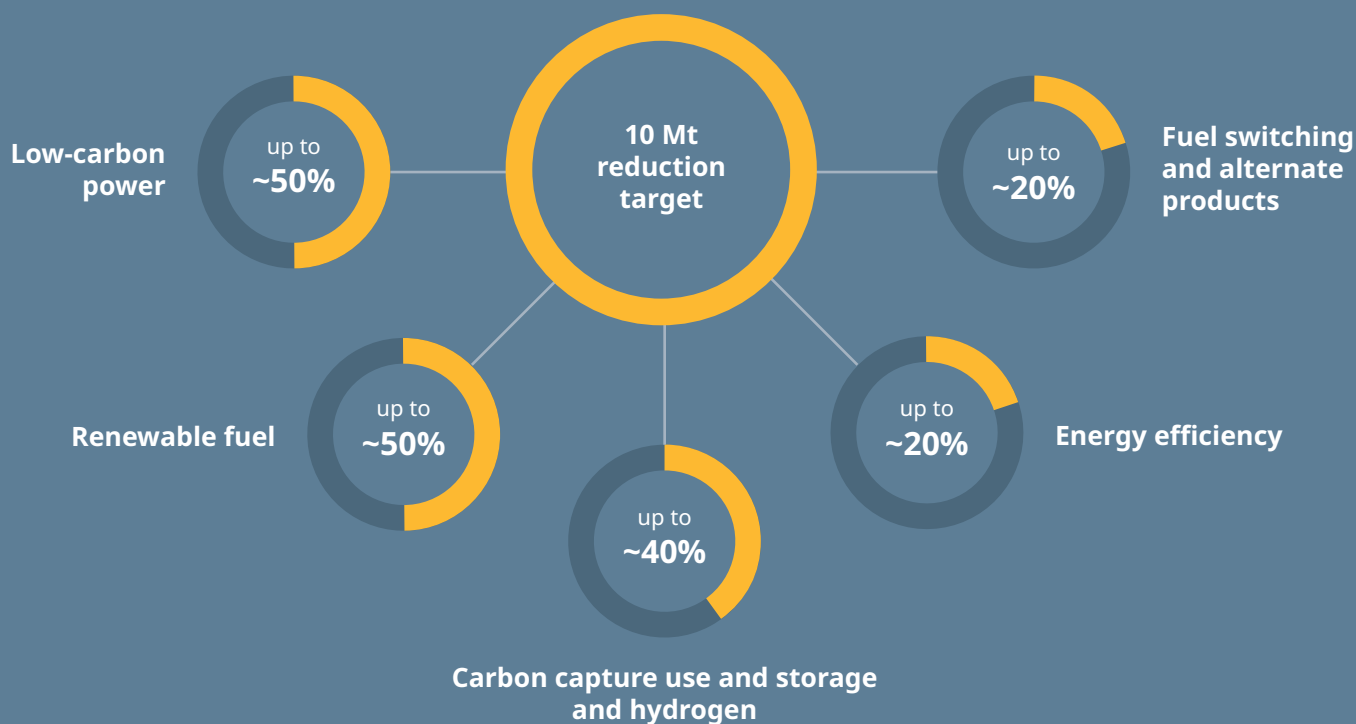
Our objective is to reach net-zero emissions by 2050 and contribute to societal emission reduction goals, including an interim target of 10 megatonnes (Mt) per year by 2030 across our value chain. Our net-zero objective applies to scope 1 and 2 emissions and given our integrated business, we see many opportunities within and outside our value chain to work with customers, suppliers, governments and other partners to help reduce emissions elsewhere (i.e., scope 3 and other emissions). Our 10 Mt target is designed to incentivize real emission reductions in the energy system, regardless of where they occur, and to focus on near- and mid-term opportunities with the biggest impact and highest payback. We will count sustained emissions reductions that relate to a direct intervention or investment by Suncor and that were implemented beginning in 2020. As outlined in the Strategy section of this report, we are focused on base business reductions that encompass fuel switching, energy efficiency, and carbon capture, use and storage (CCUS) and will focus our energy expansion on low-carbon power, renewable fuels and hydrogen.

## Low-carbon capital allocation

Our plans include allocating approximately 10% of our annual capital budget over the medium term (2022-2025) to investments that advance our low-carbon energy offerings, of which a significant portion would be allocated toward advanced technologies that provide strong, double-digit returns (e.g., Base Plant Cogeneration). In 2021 we were on target, spending approximately 9% of capital expenditures on low-carbon energies. Cogeneration represents the majority of this spend, followed by renewable fuels, renewable power, solvents, CCUS/hydrogen and bitumen conversion.



## GHG reduction approaches to 2030



Due to a large portfolio of options, opportunities to be evaluated are in excess of 10 Mt.

# GHG emissions

Suncor has reported on its direct and indirect emissions for over a decade and began reporting its scope 3 emissions from “use of sold products” in 2021. 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 emissions

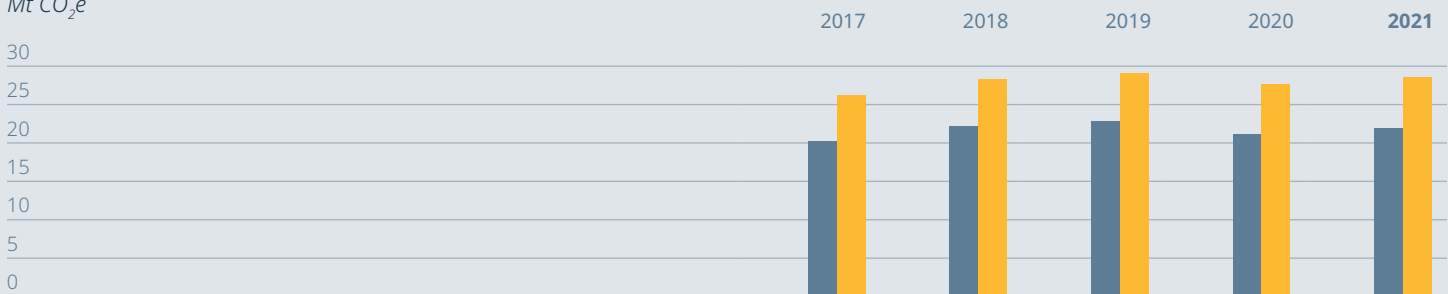
In 2021, our equity interest scope 1 and 2 GHG emissions were 28.5 Mt, a 2.7% increase from 2020. This stemmed from higher upstream reliability and production and relatively flat downstream production, impacted by facility turnarounds and lingering impacts from pandemic-related demand destruction in 2020. Higher in situ

operational performance, including an increase in the nameplate capacity at Firebag and the lifting of the Alberta production curtailment program, compensated for Fort Hills’ single-train operations, which lowered its production. Our 2021 operated<sup>11</sup> emissions were 21.6 Mt, a 3.4% increase from 2020.

Equity-based scope 1 and 2 emissions intensity increased by 1.1% compared to 2020 to 11.8 grams of carbon dioxide equivalent per megajoule (g CO<sub>2</sub>e/MJ). This slight increase was due to higher production from our in situ facilities, which have relatively higher GHG intensity, and lower production from Fort Hills, which has a relatively lower GHG intensity. On an operated basis, GHG intensity stayed relatively flat at 10.9 g CO<sub>2</sub>e/MJ.

## Absolute scope 1 and 2 GHG emissions

Mt CO<sub>2</sub>e



		Equity (%)	2017	2018	2019	2020	2021
Operated total upstream and downstream net production (million BOE)			305.24	339.33	351.28	299.02	309.92
Equity total upstream and downstream net production (million BOE)			381.89	393.23	410.09	372.16	383.40
Oil Sands Base Plant – Mining, Extraction	operated	100.00	3.82	3.30	3.95	3.80	3.74
Oil Sands Base Plant – Upgrading	operated	100.00	4.64	4.57	4.69	4.27	4.29
Oil Sands Fort Hills	operated	54.11	NA*	2.15	2.26	1.95	1.88
Oil Sands In Situ	operated	100.00	5.42	6.28	5.98	5.73	6.54
Syncrude – Mining, Extraction, Upgrading	non-operated***	58.74	6.10	6.91	7.18	7.26	7.34
Exploration and Production Canada	operated	48.00	0.65	0.62	0.52	0.00	0.00
Exploration and Production	non-operated	25.68	0.39	0.47	0.45	0.49	0.42**
Refining and Logistics	operated	100.00	5.19	4.92	5.15	4.97	4.96
Renewable Fuels	operated	100.00	0.16	0.16	0.17	0.14	0.14
Renewable Power	operated	75.00	0.00	0.00	0.00	0.00	0.00

\* Fort Hills began operations in 2018.

\*\* E&P non-operated asset 2021 GHG data had not undergone third-party verification at the time of our 2022 Climate Report publication and is subject to change.

\*\*\* On September 30, 2021, Suncor assumed operatorship of the Syncrude Joint Venture Project. Syncrude performance will be incorporated into Suncor-operated corporate totals in the next reporting cycle.

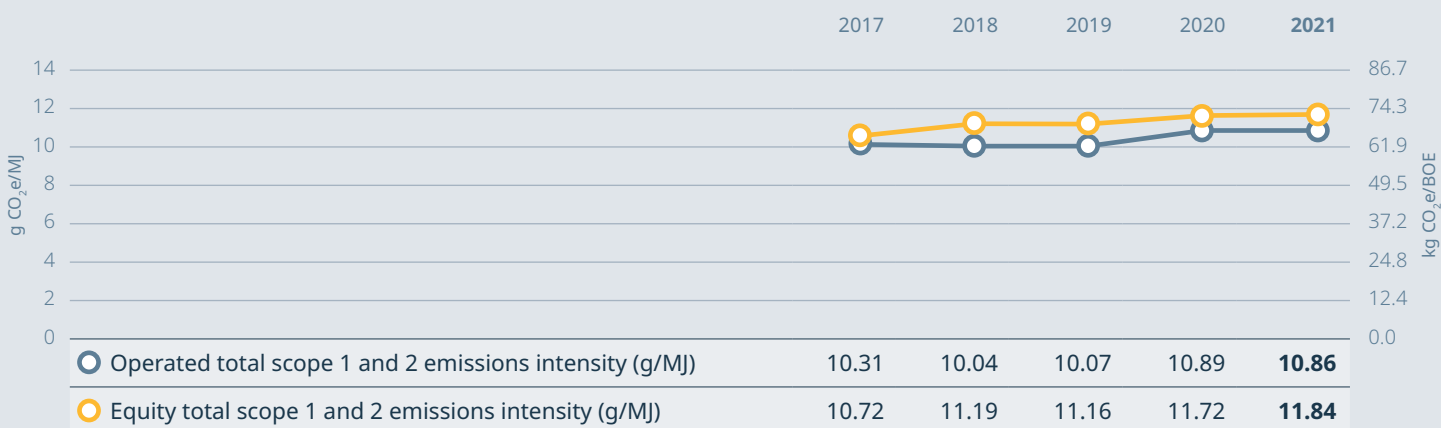
† Due to the integrated nature of cogeneration facilities, cogeneration emissions and benefits are included in the values for each facility.

‡ For additional information about this chart and its data, please refer to performance data notes #5.

11 Includes 100% of Fort Hills and 0% of Syncrude in 2021.

## GHG emissions

### Scope 1 and 2 GHG emissions intensity



Suncor uses a conversion of 1 g CO<sub>2</sub>e/MJ = 6.193 kg CO<sub>2</sub>e/BOE

		Equity (%)	2017	2018	2019	2020	2021
Oil Sands Base Plant – Mining, Extraction	operated	100.00	5.96	6.13	6.47	6.80	<b>6.45</b>
Oil Sands Base Plant – Upgrading	operated	100.00	5.37	5.93	5.45	5.05	<b>5.11</b>
Oil Sands Fort Hills	operated	54.11	NA*	6.10	5.31	6.36	<b>7.00</b>
Oil Sands In Situ	operated	100.00	9.20	9.40	9.90	10.30	<b>9.88</b>
Syncrude – Mining, Extraction, Upgrading	non-operated***	58.74	20.32	21.11	18.61	19.87	<b>19.67</b>
Exploration and Production Canada	operated	48.00	8.90	8.80	7.50	0.00	<b>0.00</b>
Exploration and Production	non-operated	25.68	1.70	2.40	2.20	2.16	<b>2.51**</b>
Refining and Logistics	operated	100.00	5.10	5.00	5.00	5.39	<b>5.44</b>
Renewable Fuels <sup>12</sup>	operated	100.00	28.10	27.90	29.50	29.50	<b>28.44</b>
Renewable Power	operated	75.00	0.00	0.00	0.00	0.00	<b>0.00</b>

\* Fort Hills began operation in 2018.

\*\* E&P non-operated asset 2021 GHG data has not undergone third-party verification at time of our 2022 Climate Report publication and is subject to change.

\*\*\* On September 30, 2021, Suncor assumed operatorship of the Syncrude Joint Venture Project. Syncrude performance will be incorporated into Suncor-operated corporate totals in the next reporting cycle.

† Due to the integrated nature of cogeneration facilities, cogeneration emissions and benefits are included in the values for each facility.

‡ For additional information about this chart and its data, please refer to performance data notes #5.

### Regulatory emission credits

For the first time, Suncor is disclosing the volume of GHG emission credits that have been retired<sup>13</sup> to meet our compliance obligations, for greater 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 2021 we retired approximately 0.6 Mt<sup>14</sup> of GHG emission credits, reducing our equity emissions from

28.5 Mt to 27.9 Mt. These credits were primarily generated from our operations that performed better than regulatory benchmarks, such as cogeneration and wind, and 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 equity emissions will be reduced through investments in our base business (i.e., energy efficiency, CCUS, fuel switching and new technology) and our value chain (i.e., low carbon power, renewable fuels, hydrogen and our connection with customers).

12 Renewable fuels may have a relatively high scope 1 and 2 carbon 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.

13 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.

14 Credit retirements in a given 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 and 2021 retired credits reflect 2018-2020 compliance.

## GHG emissions

We expect most of these investments will either directly reduce our equity emissions or result in credits that could be retired for compliance purposes.

### Scope 3 emissions

Suncor supports the disclosure of scope 3 emissions to better understand the sources of emissions along the energy value chain and where we can have the greatest impact. Scope 3 emissions result from production and consumption activities outside of our operations and include 15 categories, as defined by the GHG Protocol.<sup>15</sup> GHG emissions from the “use of sold products” (category 11) is 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%<sup>16</sup> 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 considered in the calculation of 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.

### Carbon intensity of energy products

The carbon intensity of energy products is Suncor’s estimated operational carbon intensity. It considers Suncor’s weighted average facility direct (scope 1), indirect (scope 2) and “use of sold products” (scope 3 category 11<sup>17</sup>) emissions, as a function of Suncor’s total output of energy, including production of renewable fuels and low-carbon power. Based on this methodology, Suncor’s 2021 estimated carbon intensity of energy products is 85.6 g CO<sub>2</sub>e/MJ. A breakdown of the carbon intensity of various products is provided in the table, *Carbon intensity of energy products*, for illustrative comparisons. The end-use carbon intensity of renewable fuels and hydrogen is zero; therefore, increasing production and use of these products will reduce our overall carbon intensity of products over time.

### Estimated scope 3 emissions from “use of sold products” (category 11) based on three methodologies<sup>18</sup>

Scope 3 emissions	Methodology	Considerations
<b>128 Mt CO<sub>2</sub>e</b>	<b>Upstream production</b> <ul style="list-style-type: none"> <li>Volume of oil extracted from the ground on a working-interest basis</li> <li>Assumes that the crude produced is fully combusted</li> </ul>	<ul style="list-style-type: none"> <li>Represents the total amount of fossil carbon Suncor mined and extracted</li> <li>Overestimates combusted emissions (i.e., not all crude oil is used as combustible fuel)</li> <li>Does not include purchased third-party crude that is sent to Suncor refineries</li> </ul>
<b>55 Mt CO<sub>2</sub>e</b>	<b>Refining throughput</b> <ul style="list-style-type: none"> <li>Volume of product moved through Suncor refineries; Suncor refines only a portion of its total production of crude oil</li> <li>Assumes that the products produced are fully combusted</li> </ul>	<ul style="list-style-type: none"> <li>Represents the total amount of refined fuel that is produced by Suncor, including from third-party purchased feedstock</li> <li>Excludes combustion emissions from Suncor feedstock sold to other refineries</li> </ul>
<b>24 Mt CO<sub>2</sub>e</b>	<b>Branded sales</b> <ul style="list-style-type: none"> <li>Volume of refined product sales to retail customers</li> <li>Recognizes renewable fuel sales, which do not have any scope 3 emissions</li> </ul>	<ul style="list-style-type: none"> <li>Represents the emissions from retail customers’ purchase of fuel sold by Petro-Canada™ and/or Suncor and assumes all of these emissions are combusted</li> <li>Methodology excludes wholesale volumes</li> <li>Excludes combustion emissions from Suncor feedstock sold to other parties for processing and sales</li> </ul>

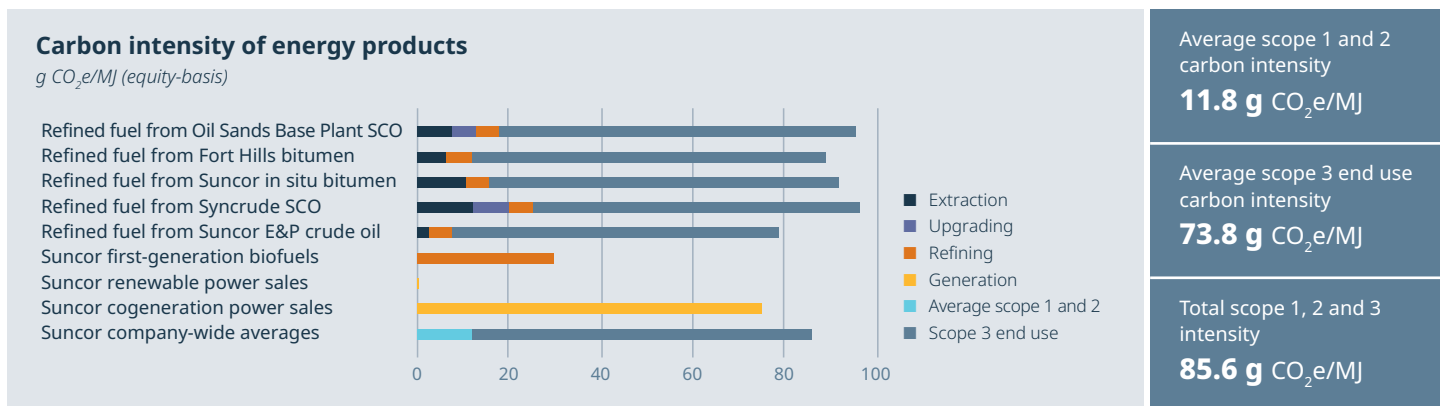
15 World Resources Institute and World Business Council for Sustainable Development, “Technical Guidance for Calculating Scope 3 Emissions (Version 1.0),” 2013. Available [online](#).

16 Government of Canada, “Oil Sands - A Strategic Resource for Canada, North America and the Global Market,” May 2015. Available [online](#).

17 Calculated using the “upstream production” method.

18 0Scope 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 category represents a unique accounting method using different boundary conditions.

## GHG emissions



### Opportunities in our value chain

While we work to reduce our own GHG emissions, we will work with suppliers to help reduce theirs and support our customers looking for cleaner energy choices. Suncor is a major consumer of energy, material goods and contracted services, and the downstream supply chain for Suncor's products can be 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.

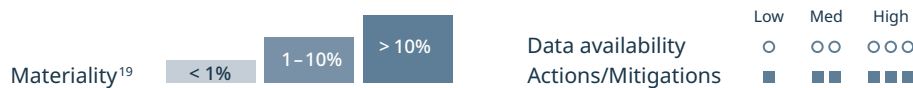
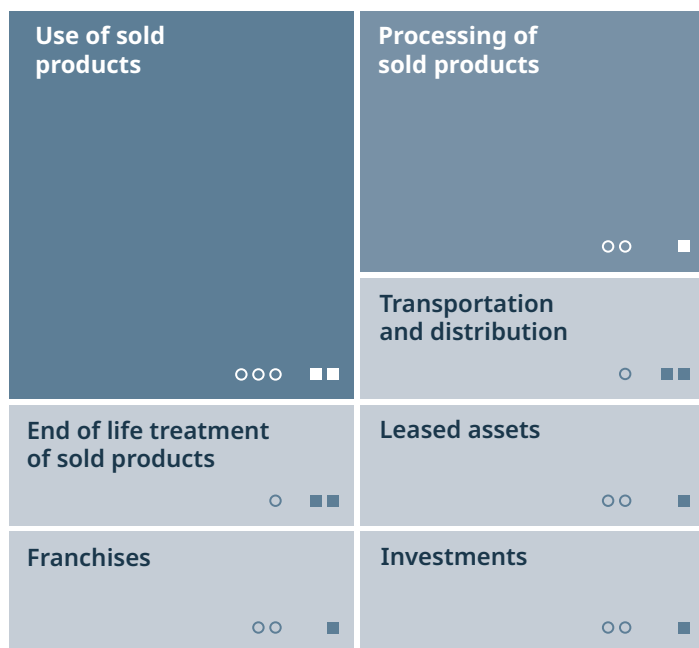
Many areas of our business provide opportunities to encourage and support system-wide carbon reductions. We're providing additional scope 3 disclosure to demonstrate our journey to more widespread decarbonization, as we seek to further understand all 15 scope 3 emissions categories and where we can have the most impact. The opportunity to influence these emissions is driven by both data availability and our ability to take mitigative actions, which limits us in many cases. While "use of sold products" is the most material category of scope 3 emissions, we are also making efforts to work with our suppliers, service providers and other business partners to reduce emissions throughout our value chain, including in the areas of "purchased goods and services and capital goods", "fuel and energy-related activities" and "processing of sold products."

### Scope 3 emissions

#### Upstream



#### Downstream



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

## GHG emissions

### GHG scope 3 categories and Suncor

	GHG Scope 3 category	How it shows up at Suncor
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
	2 Capital goods	Similar to category 1 (purchased goods), except these tend to be large-value items that retain capital value after purchase
	3 Fuel & energy-related activities	Emissions from the production of energy purchased and used
	4 Transportation & distribution	Emissions from transportation of goods to a Suncor facility, including pipeline transmission of natural gas and shipping of goods
	5 Waste generated in operations	Life-cycle emissions, including sources such as landfill gas emissions, from waste products disposed
	6 Business travel	Emissions from vehicles used by Suncor personnel for business travel outside Suncor facilities, including airplanes, automobiles, etc.
	7 Employee commuting	Emissions from the vehicles used by Suncor personnel to travel to site
	8 Leased assets	Emissions from the operations of buildings and facilities that are not owned and directly operated by Suncor
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
	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 already included in our scope 1 emissions.
	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
	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
	13 Leased assets	Emissions from facilities that are owned by Suncor and leased to another tenant or operator
	14 Franchises	Emissions from facilities owned and operated by a third party, but under a Suncor brand
	15 Investments	Emissions for any operations or facilities that are partly invested in by Suncor. These emissions are already reported in the "equity share" portion of Suncor's scope 1 emissions.

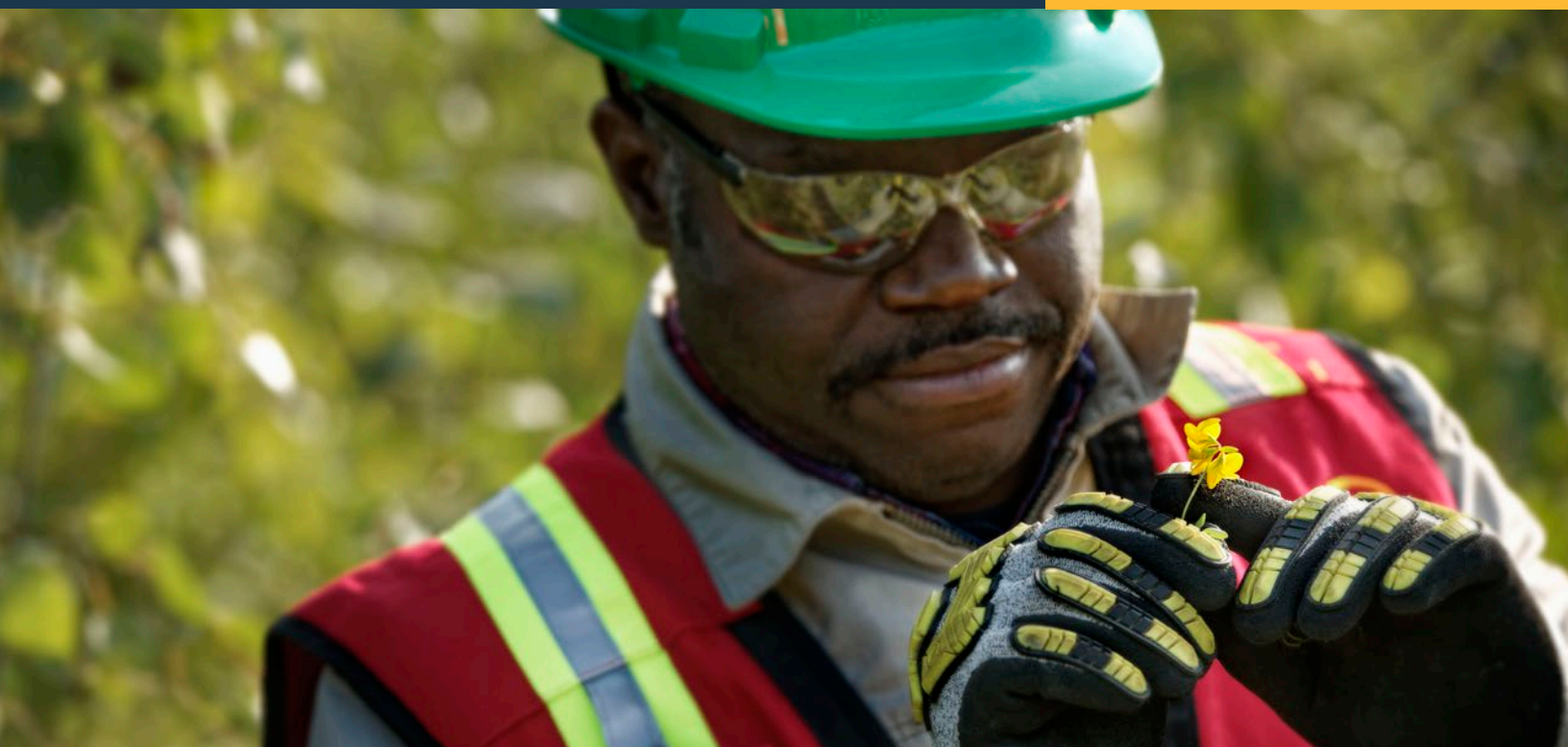
#### Purchased hydrogen emissions

While most of our scope 3 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 2021, these hydrogen purchases generated 1.47 Mt of CO<sub>2</sub>e. There is an opportunity to partner with our suppliers to reduce these scope 3 emissions. Our partnership with ATCO on a blue hydrogen project at our Edmonton refinery will meaningfully decrease imported hydrogen emissions and serve as a proof of concept for collaborations between Suncor and partners elsewhere in the value chain.



# Appendix

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



## About this report

Suncor has an extensive history of reporting on environmental, social and governance 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 climate change reporting organizations.

We appreciate that all stakeholders may benefit from further information on how Suncor is addressing climate change and our perspective on the energy future. Sharing how we manage climate-related risks and opportunities also promotes collaborative learning with our stakeholders on carbon-reduction initiatives and performance.

Now in its sixth annual update, this climate report complements sustainability performance information in our annual Report on Sustainability and enables continuous improvement in 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 new ESG Disclosure Index. Our Climate Report is a supplemental

file to the Report on Sustainability and reflects the details of our strategy, including changes to our reporting boundaries.

We are continuously evaluating appropriate disclosure opportunities to ensure we provide a transparent and wide-ranging perspective on our climate strategy over the long term, 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 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.

[suncor.com](https://www.suncor.com)

As of June 22, 2022

# Performance data

Our sustainability performance data provides annual (January 1 to December 31) environment, social, governance and economic data for 2021, with five-year performance trends where possible. Data reflects assets owned and operated by Suncor, as well as GHG data demonstrative of all Suncor equity assets, unless otherwise stated. Any data point that is accompanied by the (A) symbol was included in the scope of Ernst & Young LLP limited assurance engagement. Performance data footnotes provide additional information for specific boundary conditions, changes in methodology, restatements and definitions, where applicable. Not all data is consistent with our 2021 Annual Report due to different reporting boundaries.

Additional information can also be downloaded on [suncor.com](https://www.suncor.com).

Indicators – Suncor company totals	2017	2018	2019	2020	2021
<b>Operational performance<sup>4</sup></b>					
<b>Operated total upstream and downstream net production</b> <i>million m<sup>3</sup>/yr</i>	48.53	53.95	55.85	47.54	<b>49.27 (A)</b>
<b>Operated total upstream and downstream net production</b> <i>million BOE/yr</i>	305.24	339.33	351.28	299.02	<b>309.92 (A)</b>
<b>Operated upstream processed volumes and net production</b> <i>million m<sup>3</sup> OE/yr</i>	27.22	34.19	36.00	28.80	<b>30.94 (A)</b>
<b>Operated upstream processed volumes and net production</b> <i>million BOE/yr</i>	171.21	215.05	226.40	181.15	<b>194.63 (A)</b>
<b>Operated downstream net production</b> <i>million m<sup>3</sup> refined product/yr</i>	27.98	26.92	27.57	25.25	<b>24.97 (A)</b>
<b>Operated downstream net production</b> <i>million BOE/yr</i>	175.99	169.32	173.42	158.81	<b>157.04 (A)</b>
<b>Equity total upstream and downstream net production</b> <i>million BOE/yr</i>	381.89	393.23	410.09	372.16	<b>383.40</b>
<b>Equity upstream processed volumes and net production</b> <i>million BOE/yr</i>	251.88	268.98	285.22	254.36	<b>266.79</b>
<b>Equity downstream net production</b> <i>million BOE/yr</i>	174.45	169.35	173.42	158.74	<b>158.36</b>
<b>Ethanol production</b> <i>million litres of ethanol product/yr</i>	407.80	402.00	399.57	335.95	<b>343.44</b>
<b>Wind energy generated</b> <i>MWh</i>	76,589	100,850	98,419	96,952	<b>114,009</b>
<b>Renewable fuels blended</b> <i>billion litres</i>	1.12	1.13	1.14	1.44	<b>1.54</b>
<b>Greenhouse gas (GHG) and energy<sup>5,6</sup></b>					
<b>Operated total GHG (scope 1 and 2) emissions</b> <i>thousand tonnes CO<sub>2</sub>e</i>	19,878	21,990	22,722	20,856	<b>21,557 (A)</b>
GHG (scope 1) emissions <i>thousand tonnes CO<sub>2</sub>e</i>	18,509	20,577	21,377	19,565	<b>20,159</b>
GHG (scope 2) emissions <i>thousand tonnes CO<sub>2</sub>e</i>	1,369	1,413	1,345	1,292	<b>1,398</b>
<b>Operated total GHG emissions intensity</b> <i>kg/BOE</i>	63	62	62	66	<b>66 (A)</b>
<b>Operated total GHG emissions intensity</b> <i>g/MJ</i>	10.3	10.0	10.1	10.9	<b>10.9</b>
<b>Equity total GHG (scope 1 and 2) emissions</b> <i>thousand tonnes CO<sub>2</sub>e</i>	25,945	27,997	28,997	27,703	<b>28,452</b>

## Performance data

Indicators – Suncor company totals	2017	2018	2019	2020	2021
<b>Equity total GHG emissions intensity</b> <i>kg/BOE</i>	64	68	68	71	<b>72</b>
<b>Equity total GHG emissions intensity</b> <i>g/MJ</i>	10.7	11.2	11.2	11.7	<b>11.8</b>
<b>GHG (scope 3) emissions – Category 11 (Upstream production)</b> <i>thousand tonnes CO<sub>2</sub>e</i>	–	–	–	122,900	<b>127,600</b>
<b>Energy use</b> <i>million GJ</i>	301.98	336.10	346.31	320.05	<b>334.47</b>
Direct energy use <i>million GJ</i>	287.89	328.30	340.33	315.29	<b>325.60</b>
Indirect energy use <i>million GJ</i>	14.08	7.78	5.98	4.76	<b>8.87</b>
<b>Energy intensity</b> <i>GJ/BOE</i>	0.99	0.99	0.99	1.07	<b>1.08</b>
<b>Cogeneration gross power generation</b> <i>million MWh</i>	5.09	7.24	7.03	7.09	<b>6.34</b>
<b>Cogeneration net power export</b> <i>million MWh</i>	2.34	3.67	3.33	3.52	<b>3.27</b>

# Performance data footnotes

## 1 Overview

Performance data provided throughout our Climate Report in tables and graphs provide annual (January 1 to December 31) environmental, social, governance and economic data for 2021, with five-year trends, where possible. Note that corporate totals may not add up exactly due to rounding. These notes provide additional details on boundary conditions, and changes in methodologies, definitions, business segment structure changes or changes to historical data. We also implement our own internal guidelines and definitions for data gathering and reporting.

## 2 Reporting boundaries

Other than royalties, which represent Suncor's proportionate share of joint operations, environmental and social performance data is collected and reported for all facilities operated by Suncor (100%, not adjusted for Suncor's ownership share), and our joint venture interests operated by other organizations are not included (with the exception of our GHG emissions data, which is now reported on an operational and equity basis). Facilities are subject to annual planned and unplanned maintenance activities, which may impact consistent year-over-year trends. Facilities that are purchased and subsequently operated by Suncor in the reporting year are not included totals unless owned or operated for the entire year (12 months).

## 3 Summary of business segments and operations included in performance data

- a. Suncor totals reflect consolidation of data where relevant and applicable.
- b. Upstream (Base Plant) includes Millennium and North Steepbank mining, extraction and integrated upgrading facilities, the integrated Poplar Creek cogeneration facility (owned and operated by Suncor as of 2015), and associated infrastructure for these assets, but does not include Syncrude.
- c. Upstream (Fort Hills).
- d. Upstream (Oil Sands in situ operations) data includes oil sands bitumen production from Firebag and MacKay River operations and supporting infrastructure.
- e. Upstream Exploration and Production (E&P) includes:
  - E&P Terra Nova floating production storage and offloading vessel situated off the east coast of Canada. Production at Terra Nova has been shut in since the fourth quarter of 2019. In 2021, Suncor and the Terra Nova joint venture owners finalized an agreement to move forward with the Asset Life Extension Project, which is expected to extend production life by approximately 10 years, and produce an additional 70 million barrels of oil for the partnership.
  - Suncor holds non-operated interests in other Canadian and International E&P assets. Please visit [www.suncor.com](http://www.suncor.com).
- f. Downstream (Refining and Logistics) includes refining operations in Montreal, Quebec, Sarnia, Ontario, Edmonton, Alberta, and Commerce City, Colorado Suncor previously operated a lubricants business in Mississauga, Ontario, which was sold February 1, 2017. 2017 performance data reflects this sale. Other assets include a petrochemical plant and sulphur recovery facility in Montreal, and product pipelines and terminals in Canada and the United States. Additional information about our downstream business is available at [www.suncor.com](http://www.suncor.com).
- g. Renewable Fuels and Power includes wind power facilities operated by Suncor, and in graphs are reported with the St. Clair Ethanol Plant, located in Ontario.
- h. Suncor assumed operatorship of the Syncrude Project on September 30, 2021. Suncor's equity interest of 58.74% does not change. In this year's report, key indicators from Syncrude are highlighted throughout the content and included separately in the 2022 sustainability performance data document available for download on [suncor.com](http://suncor.com). As Suncor's operatorship of the Syncrude Project occurred at the end of the third quarter in 2021, Syncrude data is not integrated into Suncor's corporate-wide totals. The only exceptions are GHG and community investment data, which is represented as Suncor's equity share and consistent with previous reports, and workforce and diversity data, which is fully integrated. Syncrude data has been informed by GRI and SASB standards, and is reported in the detailed 2022 sustainability performance document available on [suncor.com](http://suncor.com). Not all required disclosures by GRI and SASB as described in the ESG Disclosure Index 2022 have been made for Syncrude as Suncor did not operate the Syncrude Project for the entire 2021 calendar year and its data is not incorporated into Suncor corporate-wide totals. Syncrude will be integrated into Suncor's corporate-wide totals and aligned with the required standards in future sustainability disclosure.

## Performance data footnotes

### 4 Notes on operational performance and production

- a. See “Advisories,” as barrels of oil equivalent and cubic metres of oil equivalent may be misleading indicators of value.
- b. Oil Sands Base production is gross sweet and sour synthetic crude oil associated with mining, extraction and upgrading and includes unprocessed volumes. This may be different than production reported in our 2021 Annual Report.
- c. Fort Hills production is partially upgraded bitumen associated with the paraffinic froth treatment process.
- d. Syncrude production is Syncrude Sweet Premium (SSP) crude oil produced. Production of SSP crude oil becomes the property of Syncrude’s Joint Venture Participants at point of departure from the Syncrude plant.
- e. In situ production is net bitumen sales associated with total plant saleable product.
- f. East Coast (Terra Nova) production is the total amount of product sold, not flaring or internally produced fuel. Production at Terra Nova has been shut in since the fourth quarter of 2019. In 2021, Terra Nova operations remained a non-producing facility and in late 2021 the FPSO underwent maintenance work prior to sailing to dry dock in Ferrol, Spain. A safe return to operations is anticipated before the end of 2022.
- g. Refining and Logistics net production is reported on a business unit level, where transfers between our facilities have been removed from facility production totals.
- h. St. Clair Ethanol Plant production is ethanol produced and converted to cubic metres of oil equivalent, on an energy basis.
- i. Wind energy production is in megawatt hours, from Suncor-operated wind facilities (100% – not adjusted for ownership).
- j. Our refineries that blend ethanol into gasoline are Sarnia, Montreal, Commerce City and Edmonton.
- k. Production data is inconsistent with our 2021 Annual Report due to different reporting boundaries.

### 5 Notes on greenhouse gas emissions (GHG)

#### 5.1 GHG emissions factors

Emissions factors allow us to estimate GHG emissions from a unit of available activity data (e.g., quantity of fuel consumed or product produced). The metric we use in our Report on Sustainability for reporting GHG emissions is metric tonnes of carbon dioxide equivalent (CO<sub>2</sub>e). This common unit for reporting GHGs represents volumes of gases that have been studied to have an impact on the global atmosphere. CO<sub>2</sub>e means that individual GHGs have been multiplied by their assessed global warming potential (GWP) compared to carbon dioxide (CO<sub>2</sub>). This report (and our 2015-2021 Reports on Sustainability) uses the 100-year GWPs issued by the Intergovernmental Panel on Climate Change’s (IPCC) fourth assessment report (2007), which aligns to several jurisdictions of GHG reporting, including Environment Canada and the U.S. Environmental Protection Agency (EPA). The major impacts of using the GWPs issued by the IPCC’s fourth assessment report will change and be updated with the latest assessment reporting coming out in 2022.

#### 5.2 Measuring potential GHG emission sources

As an integrated energy company spanning multiple jurisdictions, sectors and operations, we use several different externally developed and publicly accepted emission factor protocols to develop facility-specific emission calculation methodologies. We select the appropriate protocol for the site-specific fuel type and composition, emission source, facility or jurisdiction being considered. As required by regulators and verified by external auditors, we use internationally accepted GHG protocols and methodologies in determining our overall emissions profile.

In addition to using fuel-specific emission factors, some GHG emissions are calculated using process- or equipment-specific consumption rates in units such as run-hours, and not fuel volumes. Many of our sites have complicated processes that require specific emission factors and methodologies to accurately calculate their emissions.

Primarily, our sites use protocols and methodologies that are required by their operating jurisdiction. However, if no prescribed methodology is required, it may be necessary to use a combination of standardized methodologies at a single facility due to site and sector-specific details that may not be completely covered by a single standard or regulation. On occasion, more accurate emission factors – measured, calculated from compositional data or manufacturer-supplied – may be available for specific equipment. These are used whenever and wherever appropriate to ensure we gather the best-quality data and use the most accurate measures.

## Performance data footnotes

Specific emission factors are calculated from actual measured data rather than applying generic estimated default factors as frequently as possible. In other cases, such as when calculating indirect emissions from externally purchased electric power, we use factors primarily from site-specific factors if available, secondarily where prescribed by regulation and finally, from published emission factors for remaining emission sources.

Due to the unique nature of each site, we have more than 1,400 standard emission factors in our Environmental Information Management System that are applied at different sites. This number does not include thousands of additional factors that are calculated daily for different fuels and sites based on fuel composition analysis. These factors give us data on real-time gas composition and the resulting carbon content.

### 5.3 The role of regulation in GHG reporting

Many jurisdictions have, or are in the process of developing, prescriptive regulations that specify which factors can be used. For example, the EPA and regulators in Western Climate Initiative jurisdictions such as Quebec and British Columbia all required operators to use specified factors for the 2021 reporting year. Alberta requires large emitting facilities to use the standard methodology and emission factors in the Technology Innovation and Emission Reduction Regulation (TIER). Each of our sites that report through the TIER successfully generated positive (approved) verifications for the 2021 reporting year at a reasonable level of assurance. Not all verifications are final at the time of the publication of this report.

### 5.4 GHG standard practices and methodologies

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

A partial list of these standard methodologies and guidance documents includes:

- American Petroleum Institute (API) Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry, 2009
- US EPA Mandatory Greenhouse Gas Reporting Rule
- IPCC Fourth Assessment Report, 2007
- World Business Council for Sustainable Development/World Resources Institute Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, 2004
- Intergovernmental Panel on Climate Change 2006 Guidelines for National Greenhouse Gas Inventories
- Western Climate Initiative (WCI) Design for the WCI Regional Program, July 2010
- Final Essential Requirements for Mandatory Reporting – Amended for Canadian Harmonization, 2011
- Western Climate Initiative (WCI) Final Essential Requirements of Mandatory Reporting: Amended for Canadian Harmonization, 2013
- Alberta Greenhouse Gas Quantification Methodologies (Technology Innovation and Emission Reduction Regulation) (Version 2.2)
- Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere 2021
- Canadian's Greenhouse Gas Quantification Requirements (Greenhouse Gas Reporting Program), 2020
- Environment Canada National Inventory Report, 1990-2019

### 5.5 Additional GHG notes

- a. GHG emissions are calculated using facility-specific and referenced methodologies accepted by the relevant jurisdictions where each facility is required to report GHG emissions. We follow each jurisdiction's prescribed methodology, and if none exists then the most applicable and accurate methods available are used to quantify each emission source.
- b. Absolute CO<sub>2</sub>e emissions represent the total scope 1 and 2 emissions with no credit taken for low-carbon power production. The power credit is calculated using the Suncor-operated cogeneration power exported to the Alberta grid and the intensity in which this power was generated. It is included to determine the GHG emissions intensities for our operated assets.
- c. Absolute (total) GHG emissions are the sum of direct and indirect emissions.
  - Operated absolute emissions represent 100% of operated assets.

## Performance data footnotes

- Equity absolute emissions are based on Suncor's working interest for both operated and non-operated assets.
- d. The Suncor-total intensity calculation incorporates net facility production, minus internal transfers, resulting in a production value reflective of our product sales to market. Suncor-total intensity will therefore not equal the weighted average of business unit intensities.
- e. In situ (MacKay River) indirect emissions methodology reported since 2014 includes electricity purchased from the grid, purchased electricity and steam from the third-party TransCanada cogeneration units. Firebag cogeneration units are owned and operated by Suncor and therefore all cogen emissions contribute to total direct emissions, including emissions associated with generating electricity that is sold to the Alberta grid.
- f. Direct (scope 1) GHG emissions are from sources that are owned or controlled by the reporting company. Refining and Logistics direct emissions do not deduct CO<sub>2</sub> transfers to third parties, such as the food and beverage industries.
- g. Indirect (scope 2) GHG emissions are energy-related emissions that are a consequence of our operations, but occur at sources owned or controlled by another company (e.g., purchases of electricity, steam, heat and cooling). The indirect energy calculation methodology credits operations for electricity exported to external users and/or other Suncor facilities. Emissions are calculated based on actual supplier data where possible and published literature where supplier data is unavailable.
- h. Indirect (scope 3) GHG emissions are our category 11, use of sold products.
- i. Scope 3 emissions reported in the performance data section reflect Suncor's emissions from category 11 specific to our "Upstream Production" only. Additional information on Suncor's emissions from category 11 has been reported under the following categories in the 2021 Climate Report based on the following parts of our integrated business:
- Upstream production: The majority of the hydrocarbon volumes produced from Suncor operated and non-operated assets on a working interest basis must be processed into refined products, which are finally combusted. Bitumen production volumes from Firebag and Oil Sands mining have been adjusted to account for coke combusted and stored on site. Coke volumes sold to third parties for combustion have been included in this year's report. Bitumen production volumes from all assets have been reduced by 6% to account for downstream asphalt production. GHG Emission Factors sourced from API Compendium of GHG Emissions Methodologies for the Natural Gas and Oil Industry, 2009 and GREET Model.
  - Refinery throughput: Scope 3 GHG emissions for the Edmonton, Commerce City, Sarnia and Montreal refineries have been quantified based on the products each refinery produces on an annual basis, (i.e., gasoline, distillates and combustibles (propane, butane, coke and heavy fuel oil (HFO)). GHG Emission Factors sourced from API Compendium of GHG Emissions Methodologies for Oil and Natural Gas Industries, 2009.
  - Branded sales: Sales of refined products to retail customers within Canada and the U.S.; wholesales are excluded. Renewable fuel volumes which are blended with the refined products have been subtracted from total volumes as renewable fuels do not have any scope 3 (category 11) GHG emissions.
- j. Suncor's GHG target is designed to encourage business choices that reduce Suncor's emissions and the emissions in the global energy system. To support tracking our progress, Suncor developed a methodology that includes both direct emissions reductions from our operated assets and indirect reductions from the use of our products. The data in the GHG performance section reflects our owned and operated assets emissions, and new to this year, we are reporting GHG data on an equity basis as well. Emissions data from our partners have not been verified, and are subject to change. Direct and indirect CO<sub>2</sub>e emissions are included for this report. No credit is taken for GHG reductions due to internally generated performance credits, purchased offsets, ethanol life-cycle GHG reductions or wind-generated offsets.
- k. Suncor's GHG data reflects our 58.74% equity interest in the Syncrude Project. Refer to the 2022 sustainability performance data document for Syncrude performance on a separate asset basis. We are in the process of aligning Syncrude and Suncor GHG calculations and methodologies.

## 6 Notes on energy consumption

- a. Total energy is equal to the sum of direct and indirect energy. Electricity that is produced and sold to the 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.



## Performance data footnotes

- b. Direct energy is primary energy consumed on-site by Suncor-operated facilities.
- c. Indirect energy includes imported electricity, steam, heating and cooling duty from third parties. The indirect energy calculation method credits operations for electricity exported to external users and/or other Suncor facilities.
- d. The energy intensity of the renewables business is based on energy input for ethanol production with wind energy production deducted from that total energy input.
- e. Syncrude's energy performance will be incorporated into Suncor corporate totals in the next reporting cycle. Refer to the 2022 sustainability performance data document for Syncrude performance on a separate asset basis.



# Advisories

## Forward-looking statements

Suncor's 2022 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 2022 Climate Report include references to: the expectation that Suncor will be a net-zero greenhouse gas (GHG) emissions company by 2050 and substantially contribute to society's net-zero goals; the expectation that we will reach annual emission reductions of 10 Mt across our value chain by 2030; the belief that a net-zero world and Suncor's contribution to it will create value for our shareholders, customers and wider society; the belief that the company will sustain and optimize our base business while improving cost and carbon competitiveness; the belief that Suncor will grow low-GHG emissions businesses that will materially contribute to earnings and cash flow; the expectation that we will grow our customer connection through new low-carbon products and services; the belief that Suncor will achieve world-class ESG performance and disclosure while being recognized as a leader in sustainability and the energy transition; the expectation that getting to net-zero is started by reducing the emissions footprint of our base business, including use of energy-efficiency projects, new technologies and switching to lower-GHG-emitting fuels like our cogeneration project to replace our coke-fired boilers at our Base Plant and our progress on solvents for next generation in situ extraction as well as expanding our businesses in low-emissions energy like hydrogen, electricity and renewable fuels; the belief that carbon capture, use and storage (CCUS) is an important part of our plans to reduce our base business emissions and to enable the production of clean hydrogen as an energy product; the expectation that, as a partner in the Pathways Alliance with other oil sands producers and governments, we have a significant focus on CCUS by creating a major CCUS trunkline connected to a carbon sequestration hub that will play a significant role in emission reductions; the belief that addressing climate change and providing low-emission sources of energy will require investment, innovation, regulatory support, collaboration and global co-operation; the expectation that, as the world strives to reach net-zero emissions, Suncor will continue to deliver reliable and increasingly low-carbon energy; the expectation that Suncor's investment in Svante's post-combustion CO<sub>2</sub> capture technology will accelerate the commercial scale deployment of the technology at a significantly lower cost than conventional CO<sub>2</sub> capture systems; the expectation that the Pathways Alliance will work collectively with the federal and Alberta governments to achieve net-zero GHG emissions from oil sands operations by 2050; the expectation that the Extra Low Intensity Thermal Extraction subsurface steam enhancement technology at Firebag will last for approximately two years; the belief that ES-SAGD, ELITE and HOLLER technologies have the potential to reduce emissions intensity in existing in situ operations; the expectation that solvent technologies could include solvents paired with wellbore heating, super heating, or electromagnetic heating and the addition of steam; the expectation to launch a pilot project to evaluate solvent-dominated technology by early 2023; the expectation that the HOLLER project will enable us to generate zero-carbon-emission base load electricity, while responsibly sequestering process or tailings water; the expectation that Suncor will plan and initiate a pilot HOLLER project at our MacKay River in situ facility; the expectation that the coke-fired boilers at our Oil Sands Base Plant cogeneration facility will be commissioned by late 2024; the expectation that the cogeneration units will export an additional 800 megawatts (MW) of electricity to the provincial grid, equivalent to roughly 7% of Alberta's current electricity demand; the expectation that Suncor's coke-fired boiler replacement project will reduce GHG emissions by approximately 5 Mt per year compared to coal-derived power; the belief that, by replacing that water with a solvent, we could significantly reduce tailings, costs, and our GHG emissions; the expectation that, by advancing technology development to partially upgrade bitumen would reduce the temperature and pressure of our processes, decreasing the cost of treating bitumen and lowering GHG intensity; the expectation that Suncor will be allocating approximately 10% of our annual capital budget in the medium term on investments that advance our low-carbon energy offerings; the belief that Suncor will be increasing our renewable fuels production capacity; the expectation that Suncor will be increasing our low-carbon electricity capacity to market and expanding Canada's Electric Highway™; the belief that Suncor will become a producer of new forms of hydrogen by 2030; the belief that, by leading a pilot-scale production of ethanol at a low-GHG intensity in a regional context, we could create a new value chain that would support the commercial development of biofuels; the expectation that the Enkern facility in Varennes, Que., will have the largest North American electrolyzer; the expectation that LanzaJet will produce sustainable aviation fuel (SAF) from ethanol derived from a variety of sustainable sources, including wastes; the expectation that the biorefinery in Georgia, when constructed, will produce 38 million litres per year of sustainable fuels, with production slated for the second half of 2023; the expectation of a Suncor-operated commercial production facility in North America, which could be operational as early as 2025; the expectation of a mid-teen return on investment from a LanzaJet SAF production plant; the expectation of divesting our wind and solar assets; the expectation that the Forty Mile Power Project will represent 200 MW of wind capacity; the expectation that hydrogen will be a significant portion of the future energy mix and recognizing the opportunity for Alberta to be a global leader in the production of clean hydrogen; the expectations that, by using advanced technology to capture over 90% of the emissions generated in hydrogen production, and then in turn using the hydrogen in our refining processes and cogeneration, Suncor would reduce emissions while improving the energy efficiency of our base business; the expectation that, to further reduce Alberta's emissions, approximately 20% of the clean hydrogen

## Advisories

could be used in blending with Alberta's natural gas supply; the expectation that the project with ATCO will generate substantial economic activity and jobs across the province, make a sizable contribution to Canada's net-zero ambition, and has the potential to reduce emissions by more than 2 Mt per year; the expectation that a sanctioning decision could be made as early as 2024, which would support commercial operation by late 2027; the expectation that the 18-month pilot project, Alberta Zero Emissions Truck Electrification Collaboration will serve as an initial step on a path to developing economically viable commercial hydrogen transport refuelling stations; the expectation that Suncor will continue to expand our offerings as the transportation energy mix evolves through our Petro-Canada™ brand and established and trusted customer relationships with millions of Canadians; the expectation that, by pursuing opportunities both inside and outside our operations, we have a tremendous opportunity to contribute to Canada's overall emission reduction efforts; the expectation that Suncor will grow our customer connection through new low-carbon products and services and help valued customers contribute to a net-zero world; the expectation that progress on climate-related initiatives is a component of Suncor's executive compensation and that vesting will be based on progress from 2022 through 2024 toward our 2030 commitment to reduce annual GHG; the belief that "Autonomy" best represents the technology and policy context that would progress closest to achieving the aspiration of limiting global warming to 2°C or less vs. pre-industrial levels; the belief that three energy future scenarios to 2050 and a 2°C scenario to 2100 – Autonomy, Rivalry and Discord – can test and assess the resiliency of our business strategy against inherent uncertainty; the expected impacts of each of the three energy future scenarios to 2050; the expectation that a 2°C scenario provides a plausible pathway to keep global temperatures from rising 2°C, or less, by 2100 compared with pre-industrial levels; the belief that the Paris Agreement sets out a global framework to avoid dangerous levels of climate change and that we are taking steps to evaluate a 1.5°C scenario; the belief that federal government policy is clear with the intent to increase carbon pricing to \$170 per tonne by 2030; the belief that technology and innovation have the potential to move emissions reduction from incremental to step-change improvements, particularly beyond 2030 when many of these technologies are expected to be commercially available; the expectation that technology and innovation will contribute significantly to our strategic objective of net zero by 2050; the belief that the 10 Mt target should drive real emission reductions in the energy system both within and external to Suncor's operations and encourage new, lower-intensity production as part of our evaluation of new projects; the belief that Suncor will achieve our 10 Mt target by reducing emissions from low carbon power (up to 50%), renewable fuel (up to 50%), carbon capture use and storage and hydrogen (up to 40%), energy efficiency (up to 20%), and fuel switching and alternate productions (up to 20%);

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; the current and potential adverse impacts of the novel coronavirus pandemic; 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 demand and supply effects resulting from the COVID-19 pandemic and 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

## Advisories

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 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 2022 dated May 9, 2022, its Annual Information Form, and Annual Report to Shareholders, each dated February 23, 2022, and Form 40-F dated February 24, 2022 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](mailto:info@suncor.com) or by referring to the company's profile on SEDAR at [sedar.com](http://sedar.com) or EDGAR at [sec.gov](http://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.

## Reclamation and revegetation plans

Reclamation Land is considered permanently reclaimed when landform construction and contouring, clean material placement (as required), reclamation material placement and revegetation has taken place. Land cannot be listed under permanent reclamation until revegetation has occurred which is reflective of the approved reclamation and revegetation plans.

## BOEs and conversions

Certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of one barrel of oil to six thousand cubic feet of natural gas. Any figure presented in BOE may be misleading, particularly if used in isolation. A conversion ratio of one barrel of crude oil or natural gas liquids to six thousand cubic feet of natural gas is based on an energy-equivalency conversion method primarily applicable at the burner tip and does not necessarily represent a value equivalency at the wellhead. Given that the value ratio based on the current price of crude oil as compared to natural gas is significantly different from the energy equivalency of 6:1, utilizing a conversion on a 6:1 basis may be misleading as an indication of value. Cubic metres of oil equivalent are calculated on the basis of one BOE to 0.159 standard cubic metres. As cubic metres of oil equivalent are based on a conversion involving BOE, all values are subject to the same limitations as BOE, noted above.



## Advisories

### 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 2022 Climate Report does not necessarily mean a partnership in the legal context.

### Currency

Unless otherwise stated, references to “dollars” or “\$” means Canadian Dollars.

Suncor Energy Inc.  
150 – 6 Avenue S.W.  
Calgary, Alberta, Canada T2P 3E3  
T: 403-296-8000  
[suncor.com](http://suncor.com)

