



2018 CLIMATE RISK AND RESILIENCE REPORT

Suncor Energy Inc.





ABOUT THIS REPORT

Suncor has an extensive history of reporting on our environment, social and governance performance in our annual Report on Sustainability, submissions to several third-party indices and climate change reporting organizations, and our Annual Information Form/Form 40-F.

We appreciate that shareholders and other stakeholders may benefit from further information on how Suncor is addressing the challenge of climate change.

This report is intended to provide investors with Suncor's perspective on our energy future. It includes information on our climate change policy advocacy and innovation leadership and explores the challenges and opportunities of climate change and the transition to a low-carbon economy.

This stand-alone report provides specific detail on Suncor's management of climate change risk. Additional disclosure of sustainability information can be found in Suncor's 2018 Report on Sustainability.

www.sustainability.suncor.com



Steve Williams, president and chief executive officer

LETTER FROM THE PRESIDENT AND CEO

Climate change is one of the most challenging and complex issues of our time, and no one organization or sector of society can solve the issue independently. Reaching the national commitments to reduce carbon emissions that were part of the Paris Agreement requires us to be pragmatic about finding a coherent path forward that draws on all forms of responsible energy production.

Energy is central to our lives, and as Canada's leading integrated energy company, Suncor is focusing on being a cost and carbon-competitive supplier of energy in an increasingly carbon-constrained world. To achieve that goal, we need to understand the risks and opportunities and how we can best play a positive role. And, we need to share with investors and other stakeholders how we plan to remain resilient and thrive in tomorrow's low-carbon economy.

I was pleased Suncor's inaugural Climate Report, released in 2017, was well-received by investors and many of our stakeholders. It reaffirmed Suncor's belief that transparent and clear-headed carbon risk disclosure is an essential part of being a sustainable energy company.

This year's report continues to reflect how we consider carbon as a principal risk — one that has the potential to materially impact our business — and the strategies we are taking to mitigate that risk. We describe how we test our business and growth strategies against three long-term energy future scenarios. Suncor's strategy remains resilient under all of these scenarios, and we will continually test them as we move towards a low-carbon future.

In early 2018, we became a signatory of the Task Force on Climate-related Disclosures (TCFD), an international initiative that provides companies with a voluntary framework for climate-related financial disclosures. Many of the requirements of the TCFD are already

embedded in our Climate Report and we are looking at how we can best meet with the initiative's overall intent. Like many things in life and business, carbon risk disclosure is a learning curve and, as a company committed to sustainability leadership, we look forward to working with the TCFD to develop standards and best practices that improve disclosure but also better inform investors of future risks and the opportunities from a low-carbon future.

An energy transition suggests society knows where we are going, but that's not necessarily the case. We do know where we are coming from, but it's difficult to predict our final destination. Our energy future will be shaped by a growing population, the continued need to move people out of poverty, ongoing demand for food production, better education, transportation trends, access to health care, and an increasingly digital world. The challenge is how to best develop our resources while reducing environmental impact and ensure continued prosperity and healthy communities globally.

We're making progress but we also know this journey is far from over. I encourage you to read this Climate Report, along with our latest [Report on Sustainability](#). We welcome your feedback and hope you'll find it useful and share it with others. After all, in today's polarized world, constructive and solutions-focused conversations about climate change and our shared energy future are more essential than ever.

Sincerely,

Steve Williams

Steve Williams
president and chief executive officer

EXECUTIVE SUMMARY

We share in the global challenge to tackle climate change by reducing emissions while meeting growing global energy demand.

In 2017, Suncor achieved a milestone with the publication of our first stand-alone climate report. We continue to learn and improve on our approach to climate disclosure and, this year, we build on the foundation of last year's report. Some notable updates for 2018 include an expanded discussion on greenhouse gas (GHG) performance with updated 2017 data and new information on our input to climate policy as well as a refreshed low-carbon innovation section. New sections for 2018 include information about our GHG goal, by which we aim to achieve a 30% reduction in GHG intensity by 2030, and our approach to stakeholder engagement.

Earlier this year, Suncor announced support for the Task Force on Climate-related Financial Disclosure (TCFD) recommendations. We think disclosure should be a foundational activity for investor engagement and, over the next three to five years, we expect to see the number of companies reporting on climate risk grow exponentially.

GHG performance and low-carbon innovation

We're striving to reduce emissions intensity through our GHG performance goal which is expected to drive operational efficiency improvements and accelerate the adoption of new technology.

In 2017, corporate GHG performance improved over 2016, driven by reliable and efficient operations in our oil sands facilities. We had higher reliability and continue to optimize efficiency. This resulted in higher production and an overall 2% reduction in our emissions intensity.

Efficiency alone won't get us to our GHG performance goal. There must also be significant advances in technology. To meet the technology challenge, Suncor invested approximately \$350 million in 2017 in technology development and deployment to optimize current assets and develop next-generation facilities. We believe next-generation technology and energy innovation will move from incremental to transformational.

Integrating carbon risk into decision making

Suncor undertakes a corporate-wide process to identify, assess and report on significant risks. Since 2016, carbon has been considered a principal risk. Our operating capital and investment decisions are tested against a range of variables, including several carbon price outlooks, to ensure a competitive rate of return over the asset life. These price outlooks are one way to ensure we plan effectively for potential future business environments.

The decisions we make are influenced by public policy in the areas where we operate. As a result of the ratification of the Paris Agreement, we expect governments around the world will be focused on new technology, energy pathways and policy frameworks required to achieve a stable and responsible transition to a lower carbon energy system while meeting growing global demand for energy.

We also use scenario planning¹ to assess the future. As the energy system transitions away from carbon intensive sources of energy, we expect hydrocarbon fuels will continue to be needed to help meet increased global energy demand. However, all of our scenarios point to the need for us to continue to aggressively lower costs and carbon intensity throughout our business. This is not only good for the environment but we believe it is also good for business.

Business strategy for a changing future

We believe a clear outlook on where the industry is headed is essential as we adjust to technology that has opened up new oil supply sources, such as shale oil, and changed the supply cost curve.

In terms of oil sands, our long-term reserve base sharply reduces exploration costs and risk. The unique characteristics of the resource provide resiliency to continue to deliver value to shareholders in a carbon-constrained future.

Downstream, we expect to see a modest decline in demand for gasoline in North America over the next 10 years, accelerating towards 2030. Long-term gasoline demand is expected to be moderated by efficiency improvements in internal combustion engines and increased uptake of biofuels as well as hybrid and electric vehicles. However, we believe cost, consumer familiarity and carbon competitiveness mean liquid fuels will remain the primary fuel source of vehicle mobility for many years to come.

Suncor's combined wind and cogeneration power production makes us a large independent power producer in Alberta. We expect to continue to develop low-carbon power generation capacity to support our own needs while reducing the carbon intensity of power grids.

¹ We used three scenarios defined by IHS Markit as the basis for the development of the Suncor scenarios. The IHS Markit Autonomy, Rivalry and Vertigo scenarios have been modified to fit our unique circumstances/needs.

OUR PERSPECTIVE ON CLIMATE CHANGE

The World Business Council for Sustainable Development has framed the 2050 challenge as “nine billion people not just living on the planet, but living well and within the limits of the planet.” The goal of the energy system, in this context, is to deliver to nine billion people safe, affordable energy that minimizes carbon emissions.

Energy is the backbone of the economy and delivers much of our well-being and high quality of life, in addition to heating our homes and powering manufacturing.

The ability to move goods across the continent to markets and for people to be able to work and travel relies on robust, affordable transportation systems. Given what energy delivers each day, it is critical to maintain the integrity of the physical system and, understanding that energy is also part of a bigger financial and social system, maintain user utility and investor confidence.

There is general consensus that limiting the impact of climate change requires the global average increase in temperature remain below 2°C, relative to pre-industrial levels. Suncor supports the approach outlined in the Paris Agreement to help address the challenge of climate change. It is intended to motivate countries to demonstrate climate leadership through their national commitments and we will continue to support that leadership in the countries where we operate. To achieve this objective, there must be significant advances in technology, a shift in consumer choice and the development of new energy systems, all of which take time.

As the energy system transitions away from carbon intensive sources of energy, hydrocarbon fuels will continue to be needed to help meet global energy demand, particularly in developing economies. All types of energy will be needed and no single solution or pathway will meet the challenge. The pathways to a diversified and robust energy system require embracing, and getting the best out of, both traditional and new sources of energy.

LEADERSHIP IN CLIMATE POLICY

Suncor operates in multiple jurisdictions across Canada and around the world which requires we work with all governments and political parties, environmental advocacy groups and Aboriginal communities to support the development of policies that ensure cost and carbon competitiveness. We seek to contribute to the development of smart government policy in support of moving towards a low-carbon economy.

Suncor believes a broad-based price on carbon, equitably applied to both energy producers and consumers, is a key mechanism to lower emissions. As Canada’s leading integrated energy company with a significant downstream business through our Petro-Canada brand, we also participate in discussions to inform the development of policy related to the low-carbon clean fuels standard in Canada.

We demonstrate our commitment to support effective, practical and cost-efficient policy design through the following actions:

- Contributing to the development of low-carbon policies such as:
 - › Pan-Canadian Framework on Clean Growth and Climate Change
 - › Cap-and-trade programs in Ontario and Quebec (With the announcement of the termination of the cap and trade program in Ontario, Suncor will work with the provincial government to explore solutions that achieve the required outcomes while minimizing impacts to people and business.)
 - › Clean Fuel Standard in Canada
 - › Alberta’s Climate Leadership Plan

- Supporting Canada’s Ecofiscal Commission in broadening the discussion of carbon pricing into the realm of practical policy application. The Commission brings together economists to inform the critical discussion about the ecofiscal reform that Canada’s future requires.
- Suncor is a member of the Carbon Pricing Leadership Coalition (CPLC), a voluntary initiative that aspires to catalyze action towards the successful implementation of global carbon pricing. We contributed to the Canadian industry report in 2017.

We believe that good policy will instil confidence in the industry, enable continued prosperity and provide the certainty to help producers responsibly develop resources while also contributing to solutions to address global concerns about climate change.

Advancing the energy dialogue

Transitioning an energy system is as much a social and cultural shift in how people think about and use energy as it is a technological and infrastructure shift. Through the [Suncor Energy Foundation](#), Suncor supports organizations to engage Canadians in meaningful discussions on the energy system and the linkages between the environment and the economy. We’re also working with our Foundation partners to promote an understanding of the changing energy realities of the 21st century and raise awareness among Canadians of the role their choices and lifestyles play in emissions reduction.



Mark Little (second from right), Suncor chief operating officer, joins Judith Sayers (Kekinusuqs), president of the Nuu-chah-nulth Tribal Council; Chief Jim Boucher from Fort McKay First Nation; JP Gladu, president and CEO, Canadian Council for Aboriginal Business; and Melissa Quesnelle (traditional name Naatoi'lhkpiakii), executive advisor, Indigenous Sustainable Structures Collaborative at GLOBE Forum 2018 in Vancouver for a conversation on the increasingly active role of Indigenous governments and communities in energy development. Photographer: Jimmy Jeong

STAKEHOLDER ENGAGEMENT

Suncor has long held that developing responsible solutions requires engaging with shareholders, environmental organizations, local communities, Aboriginal communities, governments, and industry partners.

For years, we have created spaces for collective dialogue where multiple perspectives, experiences and the best minds may inform Suncor's approach to sustainable energy development. We do it because we recognize the value of relationships and diverse perspectives and think it's important to listen and understand other points of view.

We find value in thinking about things differently, and this often leads to new ideas, joint problem solving or new ways of working with our stakeholders.

And while we might not always agree on everything, we do have a common goal – produce energy to improve quality of life and do so in a sustainable way.

Over the past year, we have engaged with stakeholders directly, through consultations, meetings, workshops, and conferences. We will continue these activities as we develop improved climate disclosure and risk management approaches. Expected activities include a Ceres-facilitated workshop with a set of key stakeholders to solicit feedback on climate action and other sustainability topics, engagement with investors on climate-related financial disclosure, and engagement with the Climate Action 100+ initiative.

The latter is an initiative led by investors to engage with the world's largest GHG emitters to improve governance, climate-related financial disclosure, and GHG performance.

We look forward to these opportunities to build mutual understanding on the best approach for Suncor to meet its business objectives and address stakeholder expectations.

Task Force on Climate-related Financial Disclosures (TCFD)

Since mid-2017, the [TCFD](#) has shifted the discussion on the level of understanding and drive for carbon disclosure. Suncor values disclosure as a foundational activity for investor engagement and believes that the full context is required to provide a complete picture of operational performance, strategic planning and risk management.

Reporting standardization and implementing the TCFD recommendations will be challenging. There are many factors to consider and we believe transparent and decision-useful information will support long-term decision-making. In our industry, not all crude oils are equal in their level of carbon risk, and production intensities will not remain static over the coming years. Technology and innovation will lower carbon intensity and carbon competitiveness will be as important as cost competitiveness in the future.

We support the desire for consistency and transparency embodied in the TCFD recommendations and see them as a way to build on our two decades of sustainability reporting and environment, social, and

governance (ESG) investor engagement. The recommendations provide a useful framework to describe how businesses are managing climate risk and ensuring corporate strategies remain resilient in a low-carbon future.

There are still many details to work out, particularly around the appropriate disclosure vehicles to ensure we can provide a transparent and fulsome discussion on our climate strategy over the long term while recognizing the challenges of providing forward-looking information within regulatory financial disclosure requirements.

We look forward to working with the Task Force on this journey to shape and evolve climate risk disclosure so it meets the needs of both companies and investors and leads to better understanding of what's required to transition to a low carbon future.

We have provided a table showing the sections of this report that are aligned, fully or in part, with the TCFD recommendations. Over the coming year, Suncor will continue to build our internal capacity to understand potential gaps and identify the best approach to effectively improve our disclosure of climate-related financial information. We are on this journey with the TCFD and other corporate disclosers. Areas of focus for us include:

- Enhancing the analysis and disclosure of the financial impact of risks and opportunities
- Effectively disclosing our processes for climate risk identification and management
- Building on our experience with scenario planning to consider business resilience against a credible 2°C scenario

TCFD RECOMMENDATION		SUNCOR'S CLIMATE REPORT SECTION
GOVERNANCE		
Disclose the organization's governance around climate-related risks and opportunities.	Describe the board's oversight of climate-related risks and opportunities.	<ul style="list-style-type: none"> • Integration of carbon risk into our decision making processes • The energy system of tomorrow
	Describe management's role in assessing and managing climate-related risks and opportunities.	<ul style="list-style-type: none"> • Integration of carbon risk into our decision making processes • Business strategy for a changing energy future
STRATEGY		
Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	<ul style="list-style-type: none"> • Business strategy for a changing energy future • Carbon policy and impacts on Suncor • Facility resilience to extreme weather events
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	<ul style="list-style-type: none"> • Business strategy for a changing energy future • Carbon policy and impacts on Suncor
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	<ul style="list-style-type: none"> • The energy system of tomorrow • Scenario summaries • Business strategy for a changing energy future • Carbon policy and impacts on Suncor • Facility resilience to extreme weather events
RISK MANAGEMENT		
Disclose how the organization identifies, assesses, and manages climate-related risks.	Describe the organization's processes for identifying and assessing climate-related risks.	<ul style="list-style-type: none"> • Leadership in climate policy • Stakeholder engagement • Integration of carbon risk into our decision making processes
	Describe the organization's processes for managing climate-related risks.	<ul style="list-style-type: none"> • GHG performance and mitigating emissions • Low-carbon innovation
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	<ul style="list-style-type: none"> • Integration of carbon risk into our decision making processes
METRICS AND TARGETS		
Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	<ul style="list-style-type: none"> • GHG performance and mitigating emissions
	Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	<ul style="list-style-type: none"> • GHG performance and mitigating emissions
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	<ul style="list-style-type: none"> • Integrating our GHG performance goal

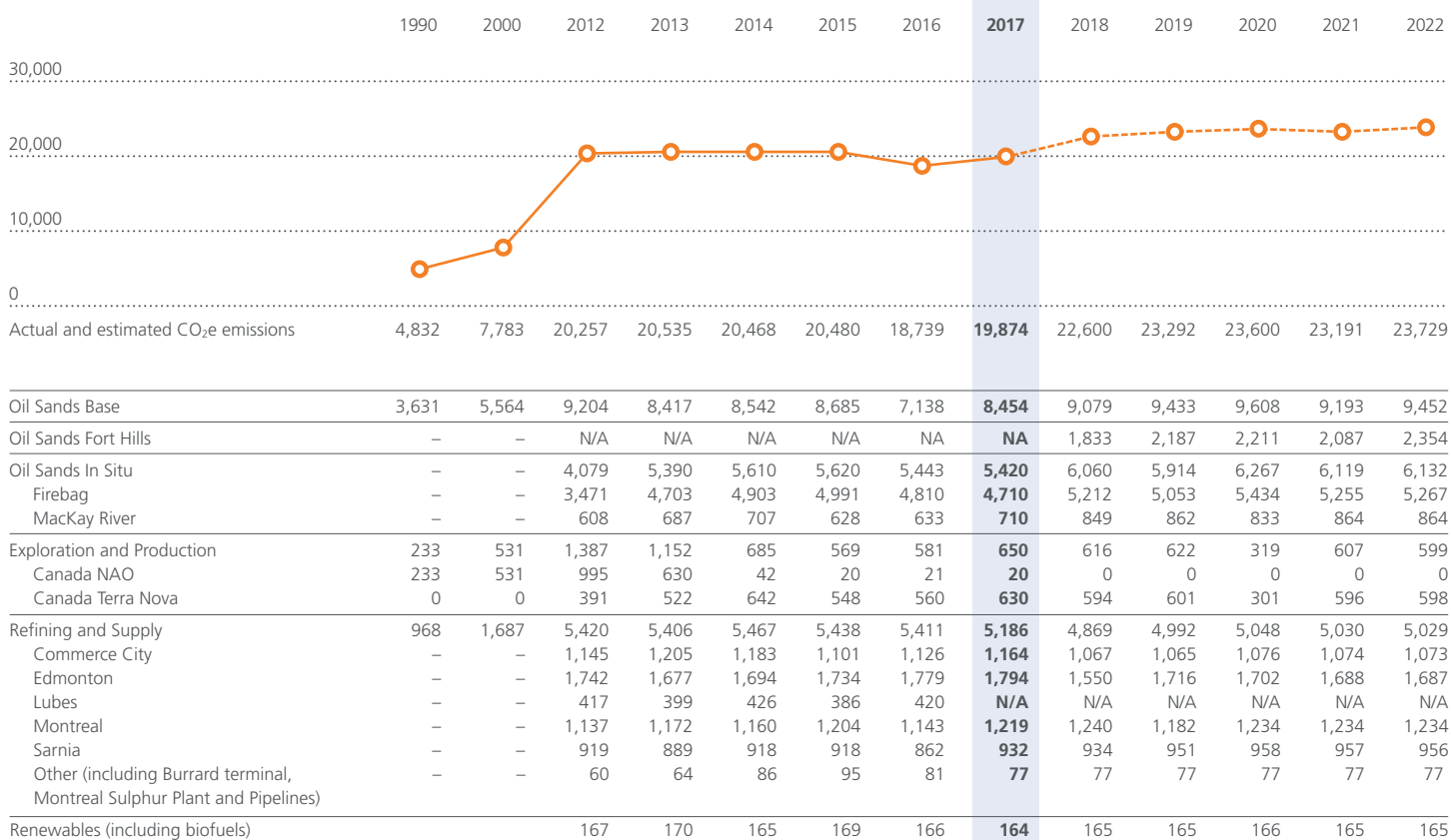
GHG PERFORMANCE AND MITIGATING EMISSIONS

Energy use is one of Suncor's largest production inputs and, therefore, there is a natural business incentive to reduce overall energy use and emissions. Suncor's focus on operational excellence and reliability, as well as the introduction of new technology, has reduced the GHG intensity of our Oil Sands Base plant by approximately 60% since 1990.

2017 GHG performance²

Absolute full-year GHG emissions in 2017 totalled 19.9 million tonnes which is in line with the three year average from 2014 to 2016. In 2017, upstream oil sands facilities recovered from the 2016 Fort McMurray wildfire and production volumes returned to 2015 levels. Oil sands performance contributed to a year-over-year improvement in our 2017 corporate GHG emission intensity of 0.410 tonnes of CO₂e per m³ of oil equivalent production. This is approximately 2% lower than 2016 and 5% lower than the 2014-2016 average.

SUNCOR-WIDE ABSOLUTE GHG EMISSIONS* actual (1990 – 2017) and estimates (2018 – 2022) thousand tonnes CO₂e equivalents (CO₂e)

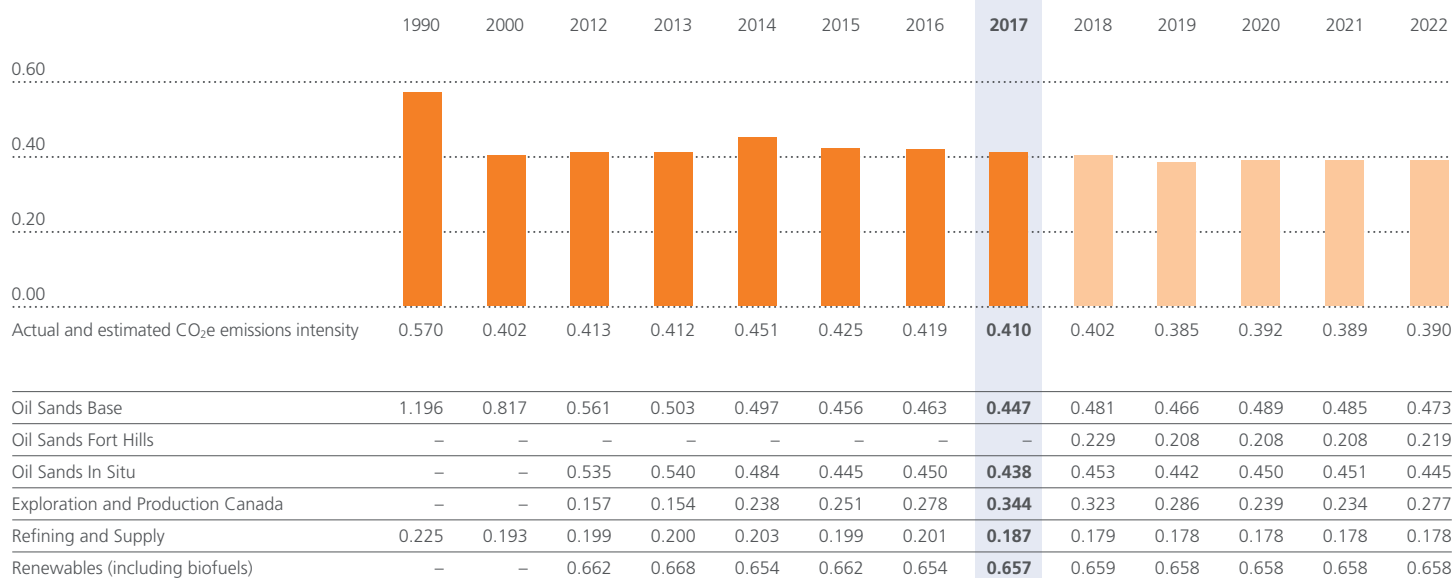


² All GHG performance values reflect Suncor-operated facilities only and represent 100% of the direct and indirect emissions at these facilities. Data is not broken down by working interest and does not include non-operated facilities.

* For additional information about this chart and its data please refer to the performance data notes.

SUNCOR-WIDE GHG EMISSIONS INTENSITY*

actual (1990 – 2017) and estimates (2018 – 2022)
tonnes CO₂e /cubic metres of oil equivalent (m³OE)



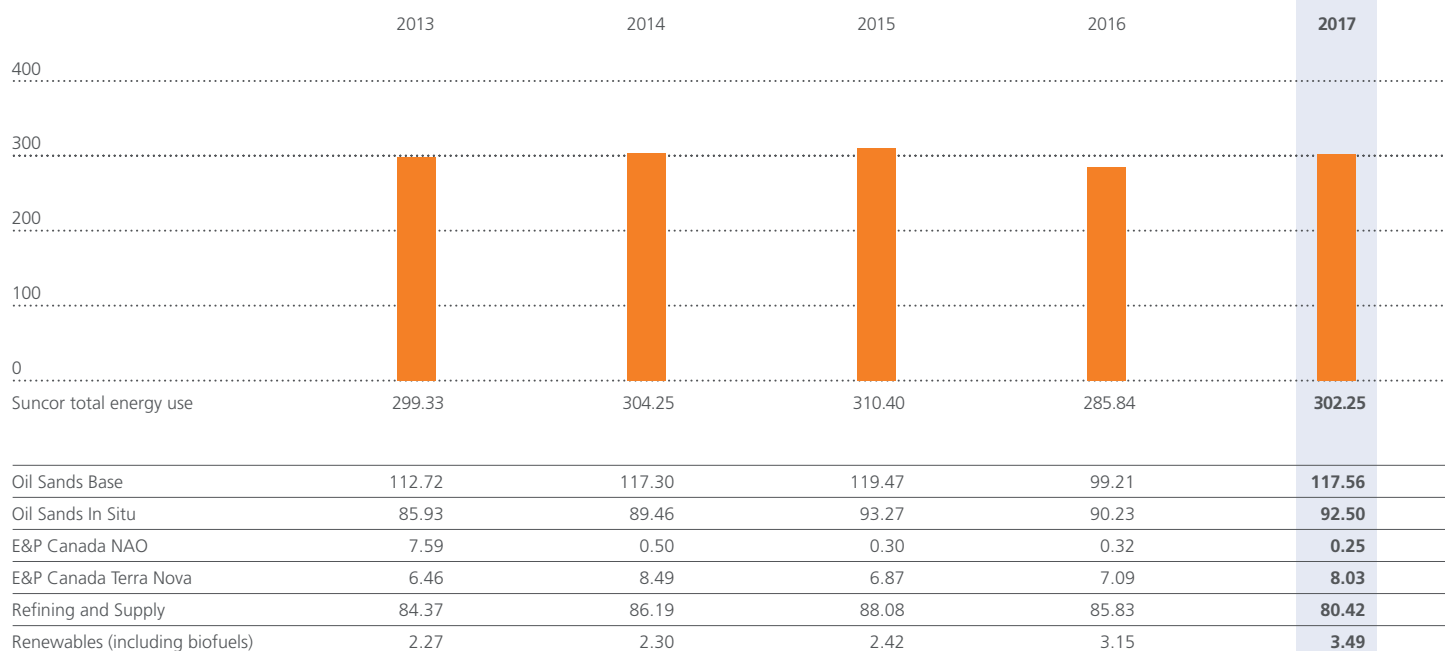
Suncor energy use and energy intensity

GHG emissions are closely linked to energy use, with approximately 90% of direct GHG emissions and nearly all indirect emissions being related to the consumption of energy for operations.

Suncor is committed to energy management and continuously improving GHG emissions reductions as part of everyday operational excellence. Our energy use and energy intensity graphs show year-over-year trends similar to the GHG emissions graphs.

ENERGY USE*

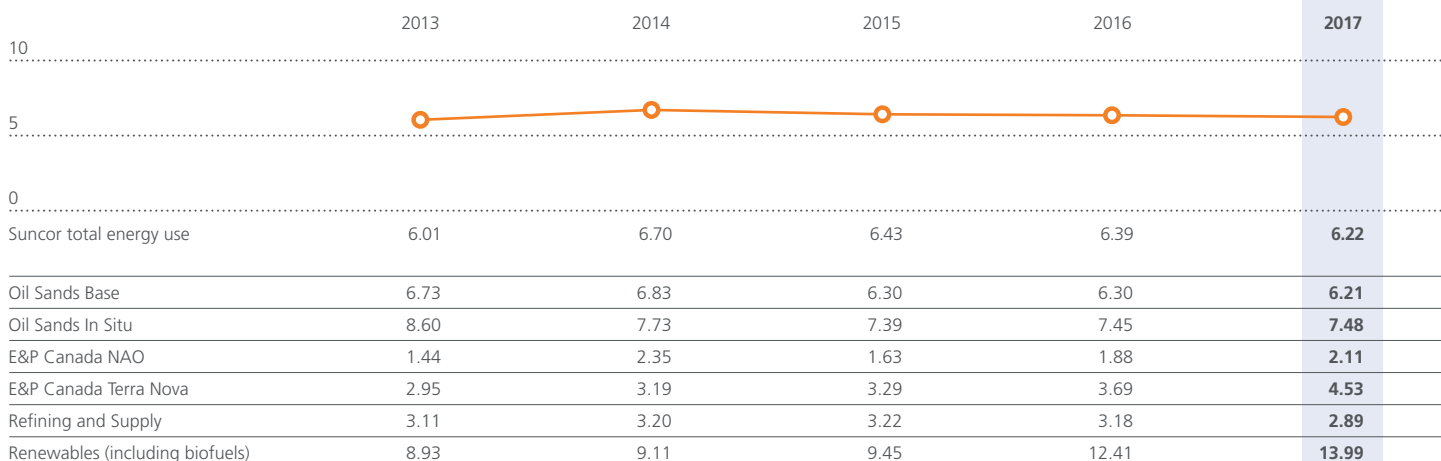
millions of gigajoules



* For additional information about this chart and its data please refer to the performance data notes

ENERGY INTENSITY*

GJ/m³ of production



Performance highlights

Oil Sands Mining

Absolute emissions from our mining, extraction and upgrading operations returned to typical levels seen prior to the 2016 Fort McMurray wildfire. Despite increased total emissions, the emissions intensity in 2017 improved by approximately 5.5% from the 2014-2016 average intensity. This reflects reliable operations and continued energy and GHG emissions reduction efforts.

Projects to optimize fuel gas distribution, heat integration, and heat exchanger maintenance were implemented in 2017. Collectively, these improved reliability, increased production and reduced emissions intensity.

Fort Hills Mining

The Fort Hills mining project achieved first oil in early 2018 and is expected to reach 90% of nameplate capacity of 194,000 bbls/d of bitumen in Q4 2018. The less carbon intensive Paraffinic Froth Treatment process (PFT) used at Fort Hills removes heavy hydrocarbon molecules in the extraction process. This produces bitumen that doesn't require upgrading prior to further refining and marketing. As a result, the GHG intensity of production is projected to be roughly half that of the existing Base plant and on par with the average crude refined in the U.S.³ The added production volumes are expected to add over 2.4 million tonnes of CO₂e to our operated GHG emissions profile once it reaches full nameplate capacity.

In Situ

The absolute emissions at our Steam Assisted Gravity Drainage (SAGD) operations were relatively unchanged year-over-year at 5.4 million tonnes CO₂e. Emissions intensity in 2017 improved to 0.436 tonnes of CO₂e per m³ of oil equivalent production which is approximately 5% lower than the 2014-2016 three-year average of 0.46 tonnes of CO₂e per m³ of oil equivalent. This improvement is due to improved facility reliability and sustained low Steam-to-Oil Ratios (SORs), resulting from optimized reservoir management strategies and strong infill well performance.

Exploration and Production

On the east coast of Canada, Terra Nova emissions increased from 0.56 million tonnes CO₂e in 2016 to 0.63 million tonnes CO₂e in 2017. The intensity increased over the 2014-2016 average from 0.256 to 0.344 tonnes of CO₂e per m³ of oil equivalent. These increases were due to reduced production and extended maintenance on the facility's vapour recovery unit. Terra Nova is the only East Coast Canada asset Suncor operates. Other international and offshore production interests are joint ventures and not within our direct operational control.

Refining and Marketing

In early 2017, Suncor closed the sale of its lubricants business, which reduced total GHG emissions at our downstream facilities to 5.186 million tonnes CO₂e. Accounting for the sale, emissions were incrementally higher at our other facilities due to higher plant utilization rates which resulted in an emissions intensity improvement of 0.187 tonnes of CO₂e per m³ of oil equivalent. This represents an approximate 7% improvement from the 2014-2016 average intensity.

Renewables and Biofuels

Suncor closed the sale of our share of the Ripley wind farm in Ontario in mid-2017. Suncor is currently involved in four operational wind power facilities with a generating capacity of 111 megawatts (MW), enough to power about 52,000 Canadian homes. Performance data is reported for operated wind farms only and is not adjusted to reflect ownership share. In 2017, our Adelaide wind farm in Ontario produced more than 76,000 MWh.

We've been blending ethanol in our retail fuels since 1992. We opened the St. Clair ethanol plant in Mooretown, Ontario in 2006. In 2011, we doubled the plant's production capacity to 400 million litres of corn-based ethanol annually. It is the single largest ethanol production plant in Canada. Absolute emissions were 0.164 million tonnes CO₂ and emissions intensity was 0.657 tonnes CO₂e per m³ oil equivalent.

³ IHS Energy Special Report: Comparing GHG Intensity of the Oil Sands and the Average US Crude Oil. May 2014.

* For additional information about this chart and its data please refer to the performance data notes.



INTEGRATING OUR GHG PERFORMANCE GOAL

In 2016, we announced a greenhouse gas goal that we will work to harness technology and innovation to set us on a transformational pathway to a low-carbon energy system. We will measure our progress by reducing the total emissions intensity of the production of our oil and petroleum products by 30% by 2030.

This ambitious goal, based on a 2014 baseline year, stretches us beyond our current technology and know-how, and ultimately aims to alter the trajectory of our absolute emissions, with the intent to make us a producer of low-carbon intensity crude.

We know this will not be achieved without integrating carbon risk into all aspects of our business; from the extraction and production of oil to refining and distributing fuels. The goal is expected to drive operational, energy and fuel efficiency improvements, accelerate the development and implementation of new technology, apply these improvements to all potential business prospects as well as encourage the evaluation of potential low-carbon business opportunities.

Operational metrics critical to meeting the goal are part of the corporate scorecard, and the initiatives required to meet the goal cascade into annual performance goals.

We continue to examine data and processes from every part of our business and identify high-opportunity areas. This work is complex and requires long-term change to how we run our business to reduce GHG emissions through operational improvements, technology

innovation and new investments. We are focusing our GHG intensity reductions in the following key areas.

Energy efficiency and continuous improvement of our base assets

We continue to drive energy efficiency at all our facilities. We are also focused on reducing GHG intensity by switching to lower carbon fuels. Our ongoing work includes:

- Sustainment of the Energy Management System (EMS) at our refineries and oil sands facilities to continue to identify and implement cost-effective energy efficiency enhancements and potential energy savings in the range of 3% to 5%.
- Building on our management structure to advance Operational Excellence by sharing knowledge and best practices across our organization, including embedding incentives for long-term GHG emissions reductions within our performance management system.

Strategic technology implementation to reduce extraction and upgrading emissions

Our goal will require us to go beyond today's capabilities, so we are aggressively working on new technology development aimed at improving the cost and carbon competitiveness of our processes and products. Details about some of the technologies and innovations we are advancing can be found in the [Low-carbon innovation](#) section.

Greening the electricity grid through investments in low-carbon power such as cogeneration and renewables

Our GHG goal is also driving us to seek and evaluate new business opportunities in the evolving future energy system.

All of our oil sands facilities use cogeneration, and we are a net exporter of power to Alberta's electricity grid. Suncor currently has cogeneration units installed at Oil Sands Base plant, Firebag, MacKay River and Fort Hills, and exports low carbon electricity to the Alberta provincial grid. By producing both industrial steam and electricity through a natural gas-fuelled process, cogeneration is the most carbon-efficient form of base load power generation. The excess power from our cogeneration facility combined with our wind energy, have reduced the overall GHG intensity of Alberta's grid.

In 2017, we took the first steps in the regulatory process for a proposed project to replace coke-fired boilers with cogeneration units at Oil Sands Base plant. In addition to providing the facility with steam needed for our operations, the cogeneration units could export up to approximately 800 megawatts (MW) of electricity to the provincial grid in Alberta. Cogeneration provides an emissions- and cost-reduction opportunity for Suncor's operations and contributes low-carbon power for Alberta. Should the project proceed as planned, construction is targeted to begin in 2019, with commissioning of the cogeneration units expected to commence by 2022. The 800 MW of power from these cogeneration units are anticipated to come online at a time when the phase-out of coal-fired electricity is expected to decrease overall supply. Industrial cogeneration's ability to supply significant volumes of reliable baseload electricity at a lower carbon intensity than combined cycle natural gas technology supports Alberta's transition towards low-carbon energy sources.

Suncor continues to evaluate investment opportunities for renewables in the areas where we operate including Canada and the U.S. Our evaluation of potential investments assesses the economic, environmental, and social benefits, enabling us to consider future development of renewable energy projects.

Other focused efforts in support of our GHG goal over the last year included:

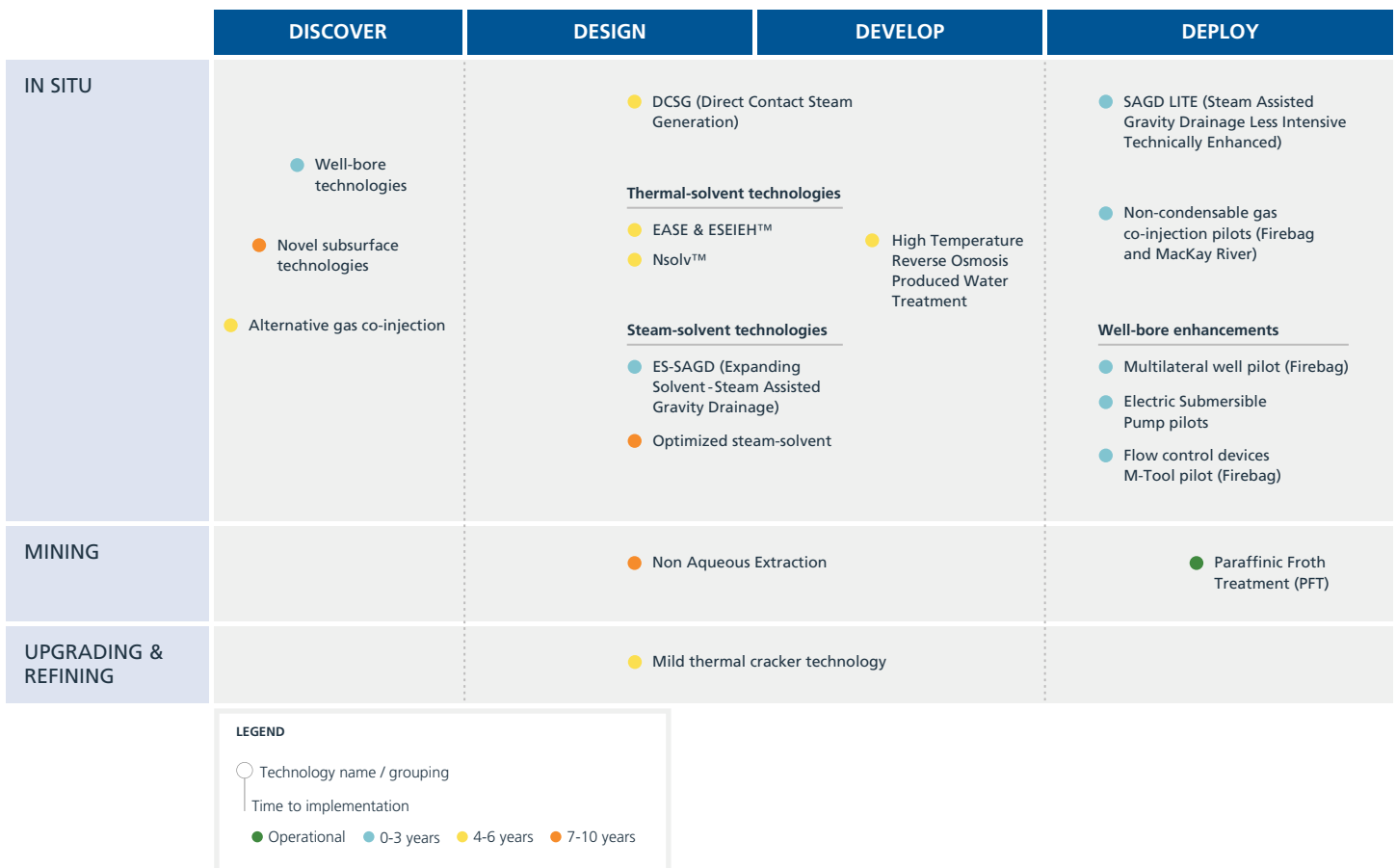
- Hosting a GHG Goal workshop with external stakeholders to solicit feedback on Suncor's goal and methodology
- Participating in the Government of Alberta's research and analysis of a potential partial upgrading bitumen program that would improve the GHG profile of oil sands crudes
- Amplifying our climate actions through:
 - › technology collaboration efforts through [Canada's Oil Sands Innovation Alliance \(COSIA\)](#)
 - › focused technology investments in clean technology funds such as [Evok Innovations](#)
 - › leading and participating in the [Clean Resource Innovation Network \(CRIN\)](#), an industry-led group created to leverage the oil and gas industry's strengths in large-scale heavy industrial collaboration.

LOW-CARBON INNOVATION

Suncor pioneered oil sands development and our early investment in technology helped unlock the potential of the oil sands. Today, new technology and innovative thinking remain fundamental to how we do business.

In 2017, we invested approximately \$350 million in technology development and deployment as part of a robust strategy to optimize current assets and develop next-generation facilities. In some cases, we led research and development of new technologies. Additional investments were made as part of collaborative efforts with consortiums and third-parties. We believe that next-generation innovation for energy technologies will continue to accelerate.

GHG: Technology development and deployment



Low-carbon in situ production

Our current technology for in situ production, Steam Assisted Gravity Drainage (SAGD), employs vertical parallel pairs of horizontal wells to recover the bitumen. The top well distributes steam to heat the reservoir, allowing the bitumen to flow to the lower well where it can be pumped to the surface. One of the challenges of SAGD is that the reservoir is typically heated to 200°C or more to get the bitumen to flow, consuming a significant amount of natural gas, and necessitating large amounts of water handling and treatment for steam production.

We are advancing a portfolio of in situ technologies to lower the carbon intensity of producing bitumen and improve cost competitiveness. We believe the solution will be a hybrid of the technologies we're progressing with the aim to reduce energy and water use, lower capital and operating costs and improve production rates and resource recovery. Some of these technologies could be applied to existing facilities or new growth facilities and, if successful, would reduce our GHG emissions intensity.

Suncor is progressing a number of technologies into the piloting phase that offer the potential for significant reductions in environmental impacts while simultaneously improving the economics of in situ bitumen production. Our primary focus is on the use of solvents to reduce extraction temperatures and energy usage, increase productivity and improve product quality. If successful, these technologies could have a significant impact in the following areas:

- energy use and GHG emissions
- water use and treatment
- land impacts
- production rates and resource recovery
- capital and operating costs
- product quality and value

Currently, we are advancing in situ technologies in these key areas:

Thermal-solvent based processes

Light solvents like propane or butane can be used in place of steam and in conjunction with wellbore heating technologies.

- We have done specific work over the last five years to advance electromagnetic assisted solvent extraction (**EASE**) technologies to heat and mobilize the bitumen as part of the Enhanced Solvent Extraction Incorporating Electromagnetic Heating (**ESEIEH™**) consortium field pilot at our Dover site. The ESEIEH™ field pilot is a project supported by a consortium of Suncor, Devon Canada, Nexen Energy ULC, Harris Corporation and Emissions Reduction Alberta.
- From 2013-2017, Suncor supported a pilot at our Dover lease to field test the solvent extraction technology called **Nsolv™** and we continue to evaluate the results.
- We continue to build on our experience of solvent-dominated processes, which date back to participation in experiments over 20 years, to develop an **optimized steam-solvent hybrid** technology to be considered for a demonstration. It potentially will be predominantly solvent-based with a relatively small fraction of steam co-injection (less than 15%) to deliver heat to the reservoir.

Steam-solvent technologies

The combination of steam and solvent offers potential for achieving significant GHG emissions reductions, and Suncor continues to advance these technologies through simulation, piloting and demonstration. There is a wide variety of solvents, concentrations and other variables to consider, and the optimal technology will depend on a combination of factors.

- One of the technologies we're currently progressing is ES-SAGD. Expanding Solvent SAGD (ES-SAGD) co-injects up to 15% solvent with steam to reduce the steam requirements of SAGD production. The process is anticipated to reduce process water requirements and lower greenhouse gas emissions by 15% or greater.

In 2018, we are advancing plans for an In Situ Demonstration Facility. The demonstration facility will be flexible in its design, enabling us to pilot and test multiple technologies at commercial scale.

Collaborating for innovation

Innovation is a process that is best served by inviting the smartest minds and brightest talent to collaborate.

Venture capital funding supports entrepreneurs to advance their ideas to commercialization and build businesses to market their technology world-wide. An example of this is **Evok Innovations**, a \$100 million technology fund co-founded by the BC Cleantech CEO Alliance, Cenovus Energy Inc. and Suncor. Suncor and Cenovus have committed up to \$50 million over the next 10 years to develop technologies to help address some of the most pressing environmental and economic challenges of our industry.

Canada's Oil Sands Innovation Alliance (COSIA) – has brought 10 companies together to pool expertise and intellectual property to accelerate technologies to improve the industry's environmental performance. [COSIA's](#) environmental focus areas attract the brightest minds from around the world. The NRG COSIA Carbon XPRIZE is one example in which 10 teams, including four teams from Canada, have advanced to the next stage of the competition to prove their technologies can be economically scaled up to transform CO₂ into valuable, useful products.

We are advancing the work of the recently formed **Clean Resource Innovation Network**, or [CRIN](#), an industry-led network to leverage the oil and gas industry's strengths in large-scale heavy industrial collaboration. CRIN's vision is to position Canada as the global leader in producing clean hydrocarbon energy from source to end use.

Low-carbon extraction

While our Oil Sands Base plant uses a first generation extraction process called Naphthenic Froth Treatment, our new Fort Hills mine uses a process called Paraffinic Froth Treatment (PFT). The bitumen product we obtain using this partial upgrading process has been upgraded to a better quality as it removes up to 10% of the asphaltenes — which is essentially composed of low-value heavy hydrocarbon molecules and undesirable particulates. Rejecting the portions of heavy hydrocarbon closer to source reduces both the diluent required for transportation and the energy and hydrogen needed to refine the bitumen into fuels. This higher quality oil sands product can be processed at a wider range of refineries. As a result of this technology, our greenhouse gas emissions for the average barrel extracted at Fort Hills are on par with the average crude refined in the U.S.



INTEGRATION OF CARBON RISK INTO OUR DECISION-MAKING PROCESSES

Breakthrough technology and shifting societal attitudes have led to governments in Canada and around the world adopting ambitious emissions reductions targets and supporting legislation. This transition risk includes measures relating to carbon pricing, clean energy and fuels standards, and alternative energy incentives and mandates which could impact profitability and/or Suncor's reputation.

Since 2016, carbon risk has been considered one of Suncor's principal risks. A principal risk is generally considered to be an exposure that has the potential to materially impact Suncor's ability to meet or support its strategic objectives. As a principal risk, carbon receives full Board and executive management attention and systems are in place to mitigate potential impacts. As such, it undergoes an annual Board of Directors review as a principal risk. Carbon risk is also brought forward to the Environment, Health, Safety and Sustainable Development Committee of the Board for oversight.

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

The company business plan, investments and all capital decisions are tested against a range of variables, including our base and alternative carbon price outlook, to ensure an expectation of a competitive rate of return over the asset life. In 2018, we also developed an

alternative case that takes a much higher view of future carbon prices. This alternative case serves as a "stress test" and adds confidence to capital decisions.

While the carbon price plays a role, the underlying crude oil price is the major driver of the investment return. A low crude oil price could be the result of a context where oil demand has been eroded through carbon policy or alternative transportation fuels and is believed to be an appropriate proxy for overall carbon risk to a project's economics. Our annual 10-year business planning process requires our businesses to run a planning case assuming a continuing low-price environment. Each business is required to demonstrate that it is expected to be able to continue to meet an acceptable rate of return, including funding its sustaining capital and enabling Suncor to maintain and grow its dividend. If the business cannot meet these objectives, it is required to outline the steps needed to achieve this target.

Our internal management model for project and asset development incorporates a review of climate change implications at the first two gate reviews, prior to a commitment of significant resources, and ensures that all climate change risks and opportunities are well understood. The process allows for analysis of technical options, but also the regulatory and external stakeholder context to be recognized in decision-making.

THE ENERGY SYSTEM OF TOMORROW

We are starting to see credible global efforts to lower emissions through broader technology and policy pathways necessary to deliver energy to a growing global population, while at the same time mitigating climate change. Limiting emissions will be achieved at an energy system-wide level in the most appropriate way for each region or jurisdiction. There are no single or simple solutions to this challenge. The phase out of coal will be a major part of this, as will gains in energy efficiency and the technologies that reduce carbon intensity across the energy system, including in oil production and consumption.

In our base case energy outlook, we take the following broad trends into consideration:

- Forecasted population growth, the increasing need for energy in developing economies and the aspiration for a better quality of life. As such, we see the global demand for energy increasing steadily. Much of this increase is expected to come from developing countries in Asia, the Middle East, Latin America and Africa.
- We expect a continuation of the trend towards decoupling economic growth and carbon emissions as new technologies and renewable energy starts to fundamentally change the energy mix.
- National emissions reduction commitments made as part of the Paris Agreement will drive carbon pricing and complementary policy frameworks that are expected to accelerate energy efficiency and emissions reduction technology and incent broader scale adoption of alternative low-carbon energy.
- We expect oil demand will continue to grow until approximately 2040 due to population growth, urbanization and increased living standards, but oil is expected to decline as a percentage of the global energy consumption mix.
- Given natural declines, staying at current production levels, much less meeting increased demand, will require investment in new production from global shale, deep-water and oil sands reserves – a major challenge, given the reduction in capital investment due to depressed commodity prices in recent years.
- We expect that supply cost will continue to be moderated by industry efforts to optimize production and invest in technological advances.

We recognize that the global effort to mitigate climate change introduces uncertainty into the range of outcomes for energy. In addition to our crude oil and refined products outlooks, we utilize three long-term energy futures scenarios⁴, all of which are plausible and could affect our operating environment and business strategy in markedly different ways. Signposts and milestones are monitored to identify critical shifts in the external context. Signposts include changes in global energy demand and supply mix, political and economic indicators, climate data and policy trends, and also include technology advances and consumer trends.

Each scenario has an implied crude oil price range and climate change regulatory impact. Two of the three reflect the current global aspiration towards reducing carbon emissions; what differentiates the scenarios is the context, pace and scale at which that comes about.

Of these scenarios, Autonomy is the scenario that we consider best represents the technology and policy context that would be essential to meet the aspiration of limiting cumulative emissions to “450 ppm”. Suncor continues to build on our experience to consider business resilience against a range of scenarios, including a credible 2°C scenario.

All three scenarios point to long-term resilience being a function of aggressively lowering both costs and the carbon intensity of the entire value chain.

The scenarios are reviewed annually by the Executive Leadership Committee and the Board of Directors to assess the robustness of the business and growth strategy and identify strategic directions. This process continues to be a useful tool for stress testing our business on a number of key dimensions, including climate risk.

⁴ We used three scenarios defined by IHS Markit as the basis for the development of the Suncor scenarios. The IHS Markit Autonomy, Rivalry and Vertigo scenarios have been modified to fit our unique circumstances/needs.

Scenario Summaries⁵

AUTONOMY	
<ul style="list-style-type: none"> • Rapid technological and societal change will transform the energy landscape. • Millennial shift – focus on sustainability and collaboration, sustainable urbanization. • Falling costs and improved reliability of clean energy allow developing countries to bypass large scale hydrocarbon-based energy infrastructure. • Natural gas is a transitional fuel for power generation, but after 2030 increasingly renewable power generation fuels a largely electrified energy system. • Breakthrough battery technology development supports growth in electric vehicles. • Oil’s role in geo-politics is substantially diminished contributing to a generally stable geo-political environment. • Stable, moderately strong economy. • Carbon intensive industries face high regulatory costs and requirements. • No new export pipelines are built out of the Athabasca Oil Sands region. 	<p>ENERGY MARKETS IMPACT</p> <ul style="list-style-type: none"> • Abundant and cost effective supply of energy coupled with moderation and eventual decline in demand, particularly in transportation, drives oil prices to stay low in the long term. • Oil exploration and production slows as investment moves to other sectors, reducing but not choking supply. • High cost supply falls off fast. • Oil is still required and continues to provide a significant share of the world’s energy need.
	<p>EXPECTED IMPACT ON SUNCOR</p> <ul style="list-style-type: none"> • No existing assets are stranded. • Existing long-life assets continue to produce, funding their own sustaining capital or modest growth capital requirements for incremental production expansion. • New oil sands growth projects are challenged and unlikely to proceed. • Oil sands continues to provide a stable dividend base while growth options in other resource basins are considered. • Only the top tier refineries will remain profitable – Suncor’s Downstream maintains a focus on reliable, efficient and low-cost operations.
RIVALRY	
<ul style="list-style-type: none"> • Improving standard of living and greater personal wealth, particularly in China. • Expanding use of advanced technologies increases demand for energy. • Population growth, urbanization and growing middle class drive energy demand – diverse supply required to satisfy demand, with intense competition for market share between energy sources. • Shift of economic power to millennials with the desire and means to address pollution and climate change. • Geo-political landscape remains tense and strong global economic growth shifts global influence. • Technology advancements allow access to greater oil reserves, with unconventional supply growing. • Natural gas and LNG play a larger role in transportation. • Strong growth in renewable energy. • Carbon intensive industries face high regulatory costs and strict standards. 	<p>ENERGY MARKETS IMPACT</p> <ul style="list-style-type: none"> • High global energy demand fed by diverse energy supply. • Refined products still dominate transportation fuels, but are losing market share to alternative fuels. • Fuel efficiency standards and technological innovation moderate growth in refined product demand. • Oil and natural gas are increasingly costly to produce and the oil price continues to trend upwards with some cyclical downturns.
	<p>EXPECTED IMPACT ON SUNCOR</p> <ul style="list-style-type: none"> • No existing assets are stranded. • High price and market access enable robust oil sands growth and further investment in improved extraction techniques. • Continued focus on carbon footprint reduction through capital projects, technology development and efficient operations. • Competitive downstream provides robust returns and enables physical integration of oil sands crude.

⁵ We used three scenarios defined by IHS Markit as the basis for the development of the Suncor scenarios. The IHS Markit Autonomy, Rivalry and Vertigo scenarios have been modified to fit our unique circumstances/needs.

VERTIGO

- Continued conflict and geo-political instability.
- International trend towards isolation and self-preservation with energy security a key concern.
- Economic volatility, unbalanced wealth distribution, overall weaker GDP growth.
- Air quality, traffic congestion lead to smaller, higher efficiency vehicles and some electric vehicle adoption.
- Extreme weather events lead to social unrest.
- Investor risk aversion and tight capital markets constrain both technology advancement and high capital projects.
- Pipeline projects constrained by stakeholder protests and investor risk aversion.
- Unstable, boom/bust energy market.
- Environmental progress and climate change mitigation takes a back seat to economic concerns.

ENERGY MARKETS IMPACT

- Fossil fuels remain the primary source of affordable energy and dominate the global energy mix.
- The price of oil recovers from current levels but fluctuates widely with rapid shifts in demand and supply.
- Slower economic growth and technological progress limit the proliferation of electric and other alternative fuel vehicles; energy mix does not change significantly.
- Slower economic growth limits growth in energy, oil and refined product demand.

EXPECTED IMPACT ON SUNCOR

- No existing assets are stranded.
- Long life assets able to deliver free cash flow through commodity price volatility, enabling Suncor to maintain competitive returns to shareholders.
- Integrated model helps smooth oil price cycles.
- Growth projects rigorously tested to ensure ability to deliver returns in volatile oil price environment.
- Financial strength is leveraged to consolidate assets at the bottom of the cycle.



BUSINESS STRATEGY FOR A CHANGING ENERGY FUTURE

Our industry is in the midst of a major structural adjustment due in large part to technology that opened up new oil supply, such as shale oil, and reduced the supply cost curve. As the industry adjusts in an effort to emerge stronger and leaner, a focus on where the industry is headed and the key influencers in both the short and longer term is essential.

Stranding the resource – threat or opportunity?

At Suncor, we talk about stranding oil resources as an opportunity, referring to leaving low value hydrocarbons in the ground due to the high environmental impact or cost of producing them. This does not suggest that Canadian operators should walk away from leases or projects. It means our project planning process reviews information about the ore quality, the geology and the hydrogeology of the reservoir, the regulatory environment and our reclamation and closure plans to assess whether there are areas of the reservoir we may choose not to produce. Also, extraction technologies under development today could literally allow us to leave the heavy hydrocarbon chains in the ground, producing a lighter product that requires less processing further down the value chain.

Oil sands

Suncor's Oil Sands operations are a concentrated unconventional oil play. Our perspective of the future tells us that now, more than ever, is the time to know where our competitive advantage lies and to play to that advantage.

We have been an operator in the Athabasca oil sands for more than 50 years and the majority of our production comes from the oil sands. There is strategic advantage in having a top-tier resource base of some of the highest quality reservoirs in the Athabasca oil sands region and substantial scale of physically integrated operations in the region. Furthermore, our largely integrated value chain allows us to extract full value for our resource.

By operating multiple, large oil sands facilities in this region, we are able to leverage location and logistics synergies between the facilities, allowing us to drive efficiencies, reduce energy costs and optimize the handling of water, waste, and tailings.

Over the past few years, we have become a top tier operator through increased facility reliability. Oil Sands operations cash operating costs have fallen from \$39.05 CAD/bbl in 2011 to \$23.80 CAD/bbl in 2017.

Recent market conditions have provided opportunities to assemble a larger base of top tier reserves. Our acquisition in 2018 of an additional 5% equity position in the Syncrude joint operation has increased our ownership to almost 59%. This counter-cyclical investment increases our production at a very attractive cost per flowing barrel relative to a greenfield project of a similar scope and nature.

This acquisition indirectly increases our exposure to carbon pricing. Over the last few years, Suncor has achieved a significant improvement in energy intensity at our own Base plant mine and upgrader through debottlenecking and improving reliability. By increasing our position in Syncrude, we have the opportunity to leverage our relationship with an experienced operator with a strong technology program to further advance energy efficiencies at both our Base plant and the Syncrude facility.

We test our oil sands business and growth strategy against the three long-term energy scenarios. Under each of these scenarios, including the most aggressive decline in oil demand, we believe a substantial amount of oil will be required for decades. Meeting that demand at either low, or highly volatile, oil prices will be a challenge.

While often characterized as being the oil basin most vulnerable to a low oil demand scenario, the very long operating life and low decline rate of our assets are, paradoxically, a major advantage under a scenario of either declining demand for crude oil and a correspondingly lower oil price, or an extended period of uncertainty and volatility in investment and commodity markets. Our long-term reserves base presents minimal finding and exploration costs or risk. The nature of the resource requires high upfront capital investment to develop a project, but once the initial infrastructure is in place, the reservoir can be incrementally developed over a long period of time, without exploration risk, or the high capital requirements of a new project. Oil sands facilities are more comparable to manufacturing operations. Once operating, they are built to last 40+ years with a steady output. Production does not rapidly peak and decline, so each new incremental expansion results in production growth. Once high upfront capital costs are depreciated, a facility can continue to operate with low operating costs and sustaining capital requirements only.

Market access for our bitumen

Market access to global refineries allows Canada to receive full value for its product.

Suncor has an interest in all of the major pipelines that are currently proposed and/or approved (Keystone XL, Line 3 and Trans Mountain), but it's important to note no single pipeline will affect our ability to execute our growth plans for the future. While we firmly believe that pipelines represent the safest and most environmentally sound way to transport product, even if further delays in pipeline projects occur, we have adequate logistical flexibility to move our production to market including Fort Hills.

In May 2018, the Government of Canada announced an agreement to buy the Trans Mountain pipeline and related infrastructure to ensure the pipeline is built. With the announcement, the government reinforced the importance of this infrastructure to all Canadians. Market access is critical and in the national interest to ensure we

receive full value for our production because this in turn means further investment in jobs, education and healthcare. What's key is that this pipeline be built and operated safely and responsibly. We will do our part to support this happening.

Transportation fuels in a carbon constrained future

While we expect our upstream crude oil production will continue to supply global oil markets, our downstream and marketing business is more exposed to North American refined product supply and demand dynamics.

Governments at all levels in Canada are seeking to diversify transportation fleets to use lower carbon intensity fuels and, as a result, the transportation fueling landscape is expected to change over time. Reducing GHG emissions from the transportation sector is arguably one of the toughest challenges, in that transportation is fundamental to economic productivity and because liquid petroleum fuels are available at a relatively low cost and high energy density.

We see demand for gasoline moderating over the next 10 years, as light vehicle fuel efficiency standards take effect and alternative fuels adoption widens. We see no near-term demand destruction for distillates in North America. In the longer term, we believe diesel will remain the predominant fuel for heavy haulage, aviation, marine and rail, and we see demand growth with increasing economic activity. Heavy-duty vehicle fuel efficiency standards and biodiesel blending are expected to offset some of the economically-driven demand growth.

Enormous strides in fuel efficiency have been made to date through ambitious regulation and by consumer uptake of more efficient light-duty vehicles. Between 2000 and 2010, fleet emissions in Canada decreased from 193 grams per kilometre to 166 g/km, a drop of 14%. As the vehicle fleet continues to turn over in the next decade, fleet average emissions are projected to reach 97 g/km by 2025⁶. While it is unclear what course the United States will take on vehicle efficiency standards going forward, there is technical potential to meet even more ambitious fuel efficiency standards. The advances in technology to capture waste heat, computerized engine optimization, as well as the development and use of lighter weight materials mean that, on the basis of fuel use per km travelled, the internal combustion engine of the future will, we believe, not only be cost competitive, but also be very carbon competitive with alternative fuels.

In our view, hybrid, plug-in hybrid and electric vehicles will become cost-effective additions to the passenger vehicle fleet and will, along with fuel efficiency standards, contribute to moderating growth in long-term global gasoline demand.

6 Pollution Probe: [The Pathways Initiative](#)



Fuel technology

Suncor has invested in [Lanzatech](#), a biofuels firm based in the United States, that is advancing a proprietary gas phase fermentation technology to recycle waste gas and greenhouse gas emissions into low carbon fuels and chemicals.

Suncor also is invested in [Benefuel](#), a technology commercialization company focused on building biodiesel production capacity using cost advantaged low carbon intensity feedstock.

We believe that cost, carbon competitiveness and consumer convenience mean that liquid fuels will remain the primary fuel source of vehicle mobility for many years. The most effective action we can take is to continue to reduce the emissions intensity of our liquid fuels.

One way to do this is through biofuel blending. Suncor owns and operates the largest ethanol plant in Canada, which provides the ethanol we blend into our gasoline. Heavy haul trucks, aviation and marine fuels of the future will require advanced biofuel blending.

Suncor also monitors technologies being developed by other parties to determine if, and when, an investment in the technology could be applied to our business given our strategic objectives and operations.

Strategically, advancing biodiesel technology for wider use in cold climates allows us to leverage our view that diesel demand will remain strong. We have the flexibility to optimize our integrated model to switch or supplement existing refining capacity to process biofuels and introduce biological crude components if it makes sense from a value creation perspective.

Over the longer term, if gasoline demand declines while distillate demand grows or remains flat, refineries will need to shift the ratio of their gasoline to distillate output. Reconfiguring a refinery to produce more distillate requires capital, and the economics of distillate production require large, complex refineries that run on heavy crude feedstock. Those refineries unable to make the investment, due to size, scale, age or crude diet, will need to reduce capacity, and we expect that would lead to continued rationalization of refining capacity on the continent.

As older and less efficient refineries close, the supply balance will support refining margins. We believe the refineries that will survive will be those that have the flexibility to process cheaper crude feedstocks, are well-located for domestic and export markets, have sound cost management, and a strong focus on energy efficient and reliable operations. Suncor's refineries are well-positioned to meet this potential trend.

Our approach to our marketing and distribution business entails a cautious evaluation of options for the future. Suncor, through its Petro-Canada brand, currently operates electric vehicle charging at select retail stations which is helping us learn more about this emerging market. We continue to evaluate options and the viability of expanding our current position and respond to the evolving needs of our customers.

In the quest to diversify fuelling options, several lower carbon options such as LNG, CNG, hydrogen and electric vehicles are being promoted. We believe the market does not have the capacity for multiple choices, and it is not clear yet which technology will see the greatest consumer adoption.

Natural gas

In the early part of this decade, Suncor sold less strategic natural gas assets that were not directly supplying our oil sands operations. This was largely motivated by a strategy of cash generation and a view that natural gas prices would stay in a down cycle for an extended period.

In 2018, Suncor sold its mineral land holdings in north-eastern British Columbia, Canada to Canbriam Energy Inc. in exchange for a 37% equity stake. The sale is consistent with Suncor's strategy to focus on a core portfolio of high return, oil-producing assets while funding a strong and competitive natural gas company. Natural gas is expected to play a critical role in bridging to a low-carbon future, particularly in transitioning power generation away from coal.

Offshore oil production

Suncor has an interest in every major development [offshore of Canada's east coast](#). Suncor operates Terra Nova and has interests in the Hibernia, White Rose and Hebron projects. We are a non-operating partner in the Buzzard and Golden Eagle fields in the [United Kingdom North Sea](#) and have expanded our options in this area through the purchase of a participating interest in the Rosebank pre-development opportunity. We have also recently acquired a participating interest in the Fenja development located in the [Norwegian Sea](#). With diligent management of produced methane, offshore crude oil is generally among the lowest carbon intensity sources of crude globally.

Low-carbon and renewable power generation

Our energy scenarios tell us that a key pathway towards decarbonization of the energy system is to substantially increase low-carbon and renewable power generation capacity and then electrify a greater percentage of the energy system.

Suncor entered the renewable power generation business in 2002 to begin participating in this growing energy sector - building today's oil sands resources while also bringing along new sources of energy for tomorrow. Since 2002, we have developed eight wind projects totalling 395 MW. Today, we are partners in four operational wind power facilities with a generating capacity of 111 MW of wind generation. By developing new renewable projects and subsequently selling down our working interest, Suncor is able to generate profitable returns on investment and create cash flow to support further new renewable developments. Suncor has a strong portfolio of renewable power development sites across Canada that will further reduce grid intensity in regions like Alberta and Saskatchewan that have a carbon-intensive grid.

We are also exploring the opportunity to develop our first utility-scale solar photovoltaic facility in Alberta to complement our experience in developing, constructing and operating wind power projects. As part of investment evaluation, we assess economic, environmental and social benefits including Indigenous partnerships in renewables. This activity also considers emission credits that can be used to offset the emissions in our oil sands operations.

The requirement for steam at crude oil extraction and processing facilities creates the opportunity for high efficiency cogeneration that provides steam and power to our facilities and delivers surplus power to the grid at a carbon intensity that is lower than any other hydrocarbon based generation. For an energy system in transition, the value of cogeneration is high; in addition to providing an effective baseload to manage the intermittency of wind and solar power, cogeneration can economically replace coal generation with much lower carbon intensity power. Suncor currently has cogeneration units installed at its Oil Sands Base plant, Firebag, MacKay River and Fort Hills facilities, and exports low-carbon excess electricity generated from these units to the provincial grid.

With both renewable and cogeneration capacity, Suncor provides approximately 700 MW to its own sites and exports approximately 500 MW to the Alberta grid.

As climate regulation is implemented across jurisdictions, renewable power benefits from greater scale which can improve technology, efficiency and improve economics. Equipping wind and solar sites with battery storage to optimize the facility's integration to the power grid could further improve effectiveness. An enabling factor will be market design that allows for dynamic interaction between a renewable, but intermittent, power source and baseload sources like cogeneration.

In 2017, we took the first steps in the regulatory process to replace coke-fired boilers with cogeneration units at our Oil Sands Base plant. In addition to providing the facility with steam needed for operations, the cogeneration units are expected to export up to approximately 800 megawatts (MW) of electricity to the provincial grid, equivalent to roughly 7% of Alberta's current electricity demand. Should the project proceed as planned, construction is targeted to begin in 2019, with commissioning of the cogeneration units expected to commence by 2022.

CARBON POLICY AND IMPACTS ON SUNCOR

Following ratification of the Paris Agreement, the focus of governments globally is on the technology pathways and policy frameworks required to achieve a stable and responsible transition to a low-carbon energy system at the same time as meeting rising global demand for energy. Suncor is preparing for that transition in multiple ways.

Our business planning process includes carbon prices that incorporate existing regulations and their expected trajectory, as they apply to our business. All investments are also sensitivity tested under a range of carbon assumptions specific to that investment. In 2018, Suncor took a further step to embed a low-carbon scenario into our business and capital investment planning process to ensure all future business plans and investments are resilient under an accelerated energy systems transition.

Canadian Federal Government

A proposed federal government Pan-Canadian carbon price framework would require each province to implement a carbon price regulation with an overall stringency equivalent to a minimum price of \$10/tonne, rising to \$50/tonne over the next five years. Provinces may use the revenue as necessary for the unique circumstances of the region, including protecting carbon-intense, trade-exposed industries.

Impact of Canadian Climate Change regulations

Our carbon price outlook assumes the current carbon price will rise to \$65/tonne, on an increasing percentage of our emissions, by 2035.

As most of our facilities are currently regulated under various carbon pricing regimes, the impact of our outlook is built into our planning assumptions.

Based on confirmation of new emissions regulations, we have updated our estimates. The production weighted average after-tax cash cost per barrel of global upstream production over the period 2018 to 2027 is estimated at up to \$0.60 per barrel.

Alberta

In Alberta, the current economy-wide price of \$30/tonne on carbon is intended to influence demand for carbon based energy. To protect the competitiveness of Alberta trade-exposed industries, output-based credits are allocated to each facility based on performance benchmark, outlined in Alberta's *Carbon Competitiveness Incentive Regulation*. The performance benchmarks penalize higher carbon intensity assets, whether a function of reservoir geology, fuel choice or efficiency, and will incent technology to reduce the carbon intensity across all facilities and particularly more challenging reservoirs.

The *Oil Sands Emissions Limit Act* includes a precedent-setting 100 MT emissions limit by 2030 on oil sands development. Emissions from the production of power through cogeneration are excluded from this limit, as is an incremental 10 MT of upgrading capacity. As a limit on emissions, rather than production, it allows production to grow as long as the total emissions of the basin remain under the limit. The emissions limit is expected to accelerate the innovation required to reduce both carbon and cost in the oil sands industry.

Quebec and Ontario

Suncor's refineries in Quebec and Ontario are regulated under a cap-and-trade program linked to the Western Climate Initiative (WCI). Regulated refining facilities receive an allowance allocation that aligns with a benchmark performance and takes into account competitiveness in a trade-exposed context. Fuel suppliers are required to purchase allowances to cover the tailpipe emissions of all fuel sold, the cost of which is expected to be largely passed to the consumer, thus acting as a carbon price on fuel consumption. With the announcement of the termination of the cap and trade program in Ontario, Suncor will work with the provincial government to explore solutions that achieve the required outcomes while minimizing impacts to people and business.

Transportation Fuels Policies in Canada

Transportation emissions are approximately 25% of total emissions in Canada. Jurisdictions across the country are considering policy mandates and incentives for alternative fuels, as well as major public transit and urban planning initiatives intended to reduce the carbon intensity of transportation.

British Columbia's *Low Carbon Fuel Requirement Regulation* requires fuel suppliers to meet a provincial fuel pool carbon intensity target through blending incremental renewable fuel or investing in alternative fuels infrastructure. Federal and provincial renewable fuel standards mandate blending of ethanol into gasoline, and biodiesel into diesel.

In addition, the federal government has recently proposed implementing a national Clean Fuels Standard, which remains under development.



FACILITY RESILIENCE TO EXTREME WEATHER EVENTS

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

Temperature extremes

Many of Suncor's facilities routinely operate in an annual temperature range of -40 to +40°C and facilities are built to withstand extreme weather events. Prolonged periods of extreme cold could force these facilities to shut down for periods of time to ensure worker safety and prevent undue stress on equipment. Prolonged periods of extreme heat may lead to production cuts if adequate supply of cooling water is not available. Suncor's refineries in Montreal and Sarnia have access to extremely large bodies of cooling water, so are far less exposed to this risk.

Hurricanes and icebergs

Suncor's Terra Nova installation, off the coast of Newfoundland, operates on the edge of the Named Atlantic Windstorm Zone, an area that is subject to hurricanes and icebergs. The risk of hurricane season is managed through a continuous weather tracking service

that monitors storm systems in the North Atlantic. There is also a risk in the region of floating icebergs causing damage to our installations. This risk is managed through the design of facilities and a continuous monitoring system tracking iceberg locations. Where the course of an iceberg cannot be altered, an emergency response system allows for the floating platform to be disengaged and moved to safer water, protecting the asset but resulting in production disruption.

Precipitation and droughts

Most of Suncor's operated facilities are not in stressed watersheds where the availability of water, or severe restrictions on water withdrawals, could compromise our ability to operate. Limits to oil sands water withdrawal during winter low flow periods are managed through on-site water storage where facility design permits. Our Commerce City refinery is located in a water-stressed region and a potential curtailment of water supply would require bringing in water by pipeline or truck. Water management is a priority at Suncor, driving industry-leading innovation at our facilities to reduce, recycle, reuse and return water.

There is also a risk of seasonal flooding in certain areas in which Suncor operates, which is managed through contingency plans to protect facilities that include backup generators and pumps to drain critical operating units and equipment.

PERFORMANCE DATA NOTES

1. Reporting boundaries

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.

2. Summary of business segments and operations included in performance data:

- a. Suncor-totals reflect consolidation of data where relevant and applicable.
- b. Upstream (Oil Sands Base operations) include Millennium and North Steepbank mining, extraction and integrated upgrading facilities, 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 (Oil Sands In Situ operations) data includes oil sands bitumen production from Firebag and MacKay River operations and supporting infrastructure.
- d. Upstream Exploration & Production (E&P) includes:
 - › E&P Terra Nova FPSO vessel situated off the east coast of Canada.
 - › E&P North America Onshore (NAO) natural gas assets operated by Suncor. Assets were significantly divested from 2013-2015, and data were reported until the date of sale.
 - › Additional information about our E&P business can be found at www.suncor.com.
- e. Downstream (Refining and Supply) includes refining operations in Montreal, Sarnia, Edmonton, and Commerce City, Colorado. Suncor previously operated a lubricants business in Mississauga, Ontario, which was sold on 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. Additional information about our downstream business is available at www.suncor.com.
- f. The St. Clair ethanol plant is located in Ontario, and beginning in 2017 is reported separately from our wind power facilities operated by Suncor.

3. Notes on greenhouse gas emissions (GHG)

This report (and our 2014-2017 Reports on Sustainability) uses the 100-year Global Warming Potentials issued by the Intergovernmental Panel on Climate Change's (IPCC's) fourth assessment report (2007), which aligns to several jurisdictions of GHG reporting, including Environment Canada and the U.S. Environmental Protection Agency.

- a. Forward looking GHG estimates are based on current production forecasts and methodologies and users of this information are cautioned that the actual GHG emissions and emission intensities may vary materially. The methodology for GHG emissions intensity forecasting has changed since 2017. Please see Advisories.
- b. GHG emissions data from 1990 and 2000 do not include Suncor's U.S. operations, or legacy Petro-Canada facilities, and only include business areas in operation during these years. These data points have been provided for historical comparability, consistent with previous sustainability reports.
- c. GHG emissions are calculated using facility-specific and referenced methodologies accepted by the relevant jurisdictions each facility is required to report GHG emissions to. Methodology has been followed where a jurisdiction has a prescribed one and if none exist then the most applicable and accurate methods available are used to quantify each emission source.
- d. Suncor-wide emissions intensity uses net production, which is the sum of net facility production minus all internal product transfers. The resulting net production is our Suncor product sales to market. The sum of the business unit GHG intensities therefore will not equal the Suncor-wide intensity.
- e. In situ (MacKay River) indirect emissions methodology reported since 2014 include electricity purchased from the grid, purchased electricity and steam from the third party MacKay River cogeneration unit. Firebag cogeneration units are owned and operated by Suncor and therefore all cogeneration unit emissions contribute to total direct emissions including emissions associated with generating electricity that is sold to the Alberta grid.

- f. Absolute (total) GHG emissions are the sum of direct and indirect emissions.
- g. Direct (Scope 1) GHG emissions are from sources that are owned or controlled by the reporting company. Refining and Marketing direct emissions do not include CO₂ transfers to third parties, such as the food and beverage industries as they do not meet the definition for CO₂ releases.
- h. 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). Emissions are calculated based on actual supplier data where possible and published literature where supplier data is unavailable.
- i. Direct and indirect CO₂e emissions are included for this report, whereas the Alberta Specified Gas Emitters Regulation (replaced by the Carbon Competitiveness Incentive Regulation in 2018) and other regulatory reports are direct emissions only. No credit is taken for GHG reductions due to cogen export, internally generated performance credits, purchased offsets, ethanol lifecycle GHG reductions or wind generated offsets.

4. Notes on energy consumption

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 GJs and deducted from total energy use.

ADVISORIES

All financial figures in this document are in Canadian dollars, unless otherwise noted.

Forward-Looking Information

This document 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 document include: statements about our energy future, including the factors and trends that are expected to shape it; expectations regarding demand for oil, natural gas, distillates, gasoline, biofuels, diesel and other energy sources; expectations for Suncor’s financial and operating performance; statements about Suncor’s emissions intensity reduction goal, the impact thereof and the key areas Suncor is focusing on to reach its goal and the potential impact of such areas; the belief that the number of companies reporting on climate risk will grow exponentially over the next three to five years; expectations relating to technology and the expected benefits therefrom, including, amongst others, technology being designed, developed or tested by Suncor and its partners such as thermal-solvent based process, steam-solvent technologies, optimized steam-solvent technologies, biodiesel, non-aqueous extraction, mild thermal cracker technology, wellbore technologies and enhancements, novel subsurface technologies, alternative gas co-injection, in situ demonstration facility, direct contact steam generation, SAGD LITE, paraffinic froth treatment, and low carbon extraction; that next generation technology and energy innovation will move from incremental to transformational change; the belief that extraction technologies under development today could allow Suncor to leave the heavy hydrocarbon chains in the ground, producing a lighter product that requires less processing further down the value chain; the expected requirements to achieve the objectives consistent with the Paris Agreement and the expectation that Suncor will support that leadership in the countries where it operates; the impact that the sustainment of the EMS and progress Operational Excellence is expected to have on reducing GHG intensity; the belief that Suncor plans effectively for potential future business environments; the expectations about the actions and areas of focus of governments around the world as it relates to the transition to a lower carbon system; statements about the replacement of coke-fired boilers with cogeneration units at Base Plant, including the expected amount of electricity which will be exported to the provincial grid and the timing associated with this project; expectations regarding lowering costs and carbon intensity; that Suncor continues to evaluate investment opportunities for renewables in Canada, including proposed wind projects and a photovoltaic facility in Alberta; expectations relating to hybrid, plug-in hybrid and electric vehicles; expectations relating to laws and government policy, the expected impacts and Suncor’s ability to contribute to the development thereof; expectations as to how to limit the impact of climate change; estimates of Suncor’s future greenhouse gas emissions and emissions intensity; statements about the Fort Hills project, including that it will reach 90% of nameplate capacity of 194,000 bbls/d of bitumen in Q4 2018, the expected amount of additional CO₂e that will be added to our operated GHG emission profile once it reaches full nameplate capacity and that the less carbon intensive paraffinic froth treatment will result in a GHG intensity of production of roughly half that of the existing Base Plant and on par with the average crude refined in the U.S.; long-term energy future scenarios used to test Suncor’s business and growth strategy, the trends that shape them and the expected impact of the scenarios on the energy markets generally and Suncor specifically; opportunities for advancing energy efficiency involving Syncrude; expectations for fleet emissions and internal combustion engines in the future; statements about the TCFD and Suncor’s areas of focus for working towards developing standards and best practices

relating to the disclosure of climate-related financial information and the expected benefits therefrom; that Suncor's long-term reserves base presents minimal finding and exploration costs or risk; statements regarding market access, including that no single pipeline will affect Suncor's ability to execute its growth plan, that pipelines represent the safest and most environmentally sound way to transport product, that receiving full value for production will result in further investment in jobs, education and healthcare and that Suncor will do its part to support this happening; the belief that liquid fuels will remain the primary fuel source of vehicle mobility for many years to come and the reasons for such belief; expectations relating to refineries; expectation regarding stakeholder engagement and its anticipated benefits; the expected role of hydrocarbons (specifically natural gas) in transitioning to a low carbon future; expectations relating to increasing low carbon and renewable power generation capacity and that these activities can provide emission credits that can be used to offset the emissions in our oil sands operations; Suncor's facility resilience to extreme weather events, including temperature extremes, hurricanes and icebergs and precipitation and droughts; and the estimated impact of our carbon price outlook. Some of the forward-looking statements may be identified by words like "expect", "will", "estimates", "plans", "intended", "believe", "projects", "could", "focus", "vision", "goal", "outlook", "proposed", "objective", "continue", "may", "aims", "would", "potential", "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 its information available at the time the statement was made and consider Suncor's experience and its perception of historical trends, including expectations and assumptions concerning: the accuracy of reserves and resources estimates; commodity prices and interest and foreign exchange rates; the performance of assets and equipment; capital efficiencies and cost savings; applicable laws and government policies; future production rates; the sufficiency of budgeted capital expenditures in carrying out planned activities; the availability and cost of labour, services and infrastructure; the satisfaction by third parties of their obligations to Suncor; the 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.

Suncor's most recently filed Annual Information Form/Form 40-F and Annual Report to Shareholders and other documents it files from time to time with securities regulatory authorities describe the risks, uncertainties, material assumptions and other factors that could influence actual results and such factors are incorporated herein by reference. Copies of these documents are available without charge from Suncor at 150 6th Avenue S.W., Calgary, Alberta T2P 3E3; by email request to invest@suncor.com; by calling 1-800-558-9071; or by referring to the company's profile on SEDAR at sedar.com or EDGAR at sec.gov. Except as required by applicable securities laws, Suncor disclaims any intention or obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

Non-GAAP Measures

Oil Sands operations cash operating costs per barrel is not prescribed by Canadian generally accepted accounting principles ("GAAP"). For the 2017, this non-GAAP measure is defined and reconciled in Suncor's Annual Report to Shareholders for 2017 dated March 1, 2018. For 2011, this non-GAAP measure is defined and reconciled in Suncor's Management Discussion and Analysis for the year ended December 31, 2013 dated February 24, 2014. This non-GAAP measure does not have any standardized meaning and therefore is unlikely to be comparable to similar measures presented by other companies. This non-GAAP measure is included because management uses the information to measure Oil Sands operating performance, and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with GAAP.

BOEs – Certain natural gas volumes have been converted to barrels of oil equivalent (boe) on the basis of one barrel to six thousand cubic feet. Any figure presented in boe may be misleading, particularly if used in isolation. A conversion ratio of one barrel of crude oil or natural gas liquids to six thousand cubic feet of natural gas is based on an energy equivalency conversion method primarily applicable at the burner tip and does not necessarily represent a value equivalency at the wellhead. Given that the value ratio based on the current price of crude oil as compared to natural gas is significantly different from the energy equivalency of 6:1, utilizing a conversion on a 6:1 basis may be misleading as an indication of value.

Cubic metres of oil equivalent and 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. Certain ethanol volumes have been converted to cubic metres of oil equivalent. The Ethanol oil equivalent is 23.6 MJ/litre HHV and the Crude Oil equivalent is 38.5 MJ/litre HHV. This conversion is based on an energy equivalency conversion method and does not represent a value equivalency.



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