
Imperial
Moving forward
ADVANCING CLIMATE SOLUTIONS

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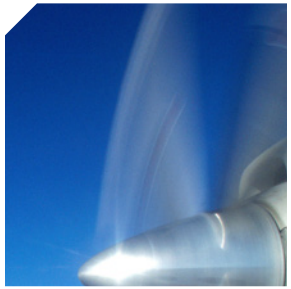

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Letter from the Chairman

A shared mindset – aiming for a net-zero future

When it comes to managing the risks of climate change, society is moving forward at an accelerated pace. For a successful energy transition, we will need to collectively ensure affordable, accessible and reliable energy is available to meet society's needs while advancing towards a net-zero future. Finding solutions will be critical for Canada to sustain its role as an energy security partner to its global allies.

Lower-emissions energy systems require accelerated innovative technology solutions. There are multiple paths to reduce greenhouse gas emissions with a range of possible future scenarios. No single technology can enable society to achieve its lower-carbon ambitions. We anticipate progress in the development and deployment of renewable fuels, carbon capture and storage, low-carbon intensity hydrogen, lower-emissions Canadian oil and natural gas and electricity from wind, solar and nuclear. Innovation, tenacity, and collaboration will be needed on this journey.

Imperial recognizes the important role it can play by advancing climate solutions within our operations and by providing lower life-cycle emission products to our customers. To achieve this, our strategy leverages local advantages such as our skilled workforce, emerging technology, integrated operations, and a mature regulatory framework. Over the last several years, Imperial has created greenhouse gas (GHG) reduction pathways for our operated oil sands that have informed our plans and has culminated in our long-term goal to achieve net-zero emissions (scope 1 and 2) for operated oil sands by 2050.

We recognize that connectivity and knowledge sharing positions our industry for a resilient lower-emissions competitive future. Imperial became a founding member of the Oil Sands Pathways to Net Zero alliance where the goal of this alliance is to work with the Government of Canada and the Government of Alberta to achieve net-zero emissions (scope 1 and 2) for operated oil sands by 2050.

I am very proud of the tremendous progress our employees have made over the past year to reduce our GHG emissions.[1] Imperial remains on track to meet our previous greenhouse gas emissions intensity goal of a 10 per cent reduction for operated oil sands facilities by the end of 2023, compared to 2016 levels and has recently announced plans to increase this reduction to a 30 per cent reduction by 2030.[1, 2]

The company plans to achieve this through the implementation of lower GHG next-generation technologies at our upstream operations, energy efficiency improvements, and the use of carbon capture and storage. We are very excited about our plans to construct the largest renewable diesel manufacturing facility in Canada at our Strathcona refinery in Edmonton, Alberta. This world-class facility will be a significant value-generating, forward-looking emission reduction project that brings together our proprietary technologies and refining scale to the benefit of the environment, the economy and customers.

Moving forward, I believe we have the tools, expertise and dedicated employees to create value for our shareholders in a competitive marketplace while helping to contribute to Canada's ambition to achieve net-zero emissions by 2050. I am confident in our ability to remain an industry leader in the evolving global energy landscape.

I am pleased to share with you our Advancing Climate Solutions report, a progress report that demonstrates our ongoing commitment to 'bending the curve' and lowering GHG emissions. I appreciate your interest and welcome your feedback on our efforts.

Brad Corson
Chairman, President and CEO

Summary-at-a-glance

Delivering value and moving forward

A successful energy transition ensures affordable, accessible and reliable energy is available to meet society's needs while accelerating to a net-zero future. Failure to do so could result in a loss of energy security and disorderly transition for society.

Imperial's vision for collective success is to deliver value by providing energy solutions, including addressing the risks of climate change, in a way that helps people, the environment, and the communities where we operate. Achieving this shared vision will require leadership, ingenuity and collaboration with governments, Indigenous communities, technology firms and other third parties. Government support is critical in developing durable, predictable, supportive and market driven policies in order to help drive the greatest greenhouse gas (GHG) emission reductions at the lowest cost to society.

Imperial aspires to provide energy transition solutions for our company and our customers. By leveraging expertise in science, engineering, research and project development and working with governments, customers, partners and Indigenous peoples we have an opportunity to thrive together.

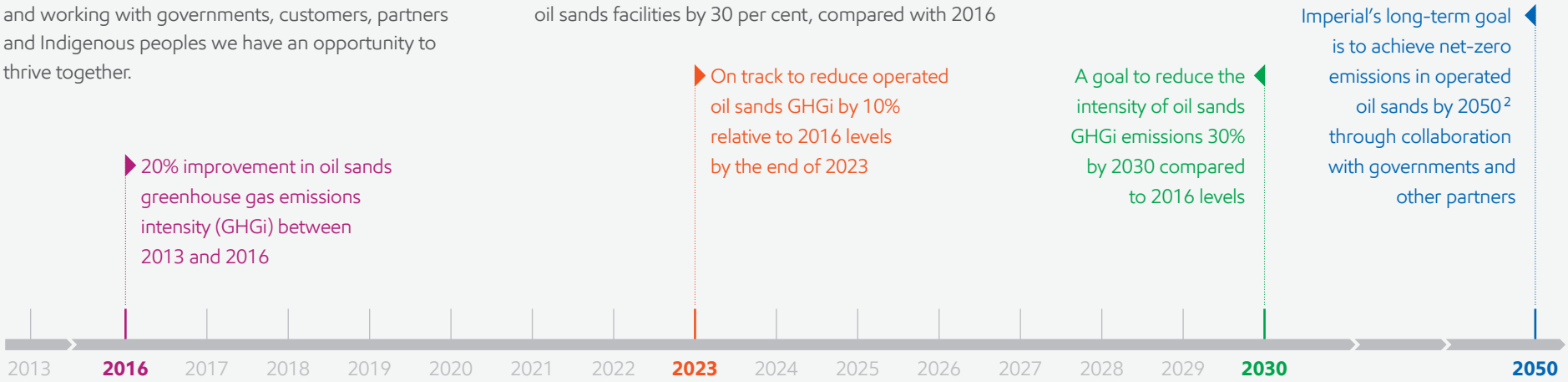
Net zero 2050 and 2030 GHGi operated oil sands goals

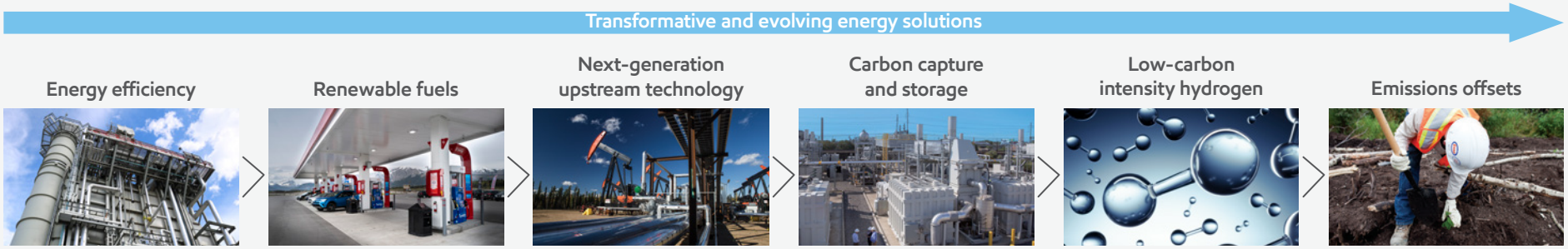
Lower-emissions energy systems require accelerated development and deployment of innovative technology. Various third-party hypothetical scenarios illustrate potential transition pathways that can be very different and with a wide range of uncertainty based on the pace of transition policy developments and scaling of technologies. A shift from more carbon intensive fuel mix to lower-carbon sources is identified in all scenarios, with all energy remaining important through 2050, including energy from oil and gas.

Imperial respects and supports the goals of the Paris Agreement [3] and Canada's ambition to achieve net-zero emissions by 2050. Over the last several years Imperial has created GHG reduction pathways for our operated oil sands that have informed our plans and have culminated in our long-term goal to achieve net-zero emissions (scope 1 and 2) for operated oil sands by 2050.

By the end of 2030, Imperial expects to reduce greenhouse gas emissions intensity (GHGi) of its operated oil sands facilities by 30 per cent, compared with 2016 levels.[1, 2] The company plans to achieve this through the implementation of lower GHG next-generation technologies at our upstream operations, energy efficiency improvements at our facilities, renewables and use of carbon capture and storage. This 2030 goal will facilitate benchmarking and is anticipated to result in 'bending the curve' on emissions when combined with our net-zero goal.

In the interim, the company remains on track to meet our previous greenhouse gas emissions intensity goal of a 10 percent reduction for operated oil sands facilities by the end of 2023, compared to 2016 levels.[1, 2] Key initiatives include heat and water recovery from boiler flue gas at our Kearl oil sands mine, liquid addition to steam for enhanced recovery (LASER) at Cold Lake and operational efficiencies. This improvement builds on Imperial's previous success of reducing emissions intensity by more than 20 per cent in our operated oil sands between 2013 and 2016.





Founding member of the Oil Sands Pathways to Net Zero Alliance

Imperial will work alongside our partners and Government of Canada and Government of Alberta toward the goal of achieving net-zero GHG emissions from oil sands operations by 2050,[1] collectively reducing an estimated 68 Mt/CO_2e per year.

Transformational technology solutions

Our plans include growth in renewable fuels, next-generation solvent-based oil sands recovery technologies, carbon capture and storage, low-carbon intensity hydrogen and potentially using high-quality emissions offsets to address residual emissions.

Imperial's next-generation upstream technologies such as Cyclic Solvent Process (CSP) or Enhanced Bitumen Recovery Technology (EBRT) use light hydrocarbons to replace most of the steam used to recover bitumen while providing anticipated GHGi reductions up to 90 per cent. Of significance, when coupled with carbon capture and storage, these lower-emission technologies have the ability to produce incremental barrels at net-zero emissions.

Carbon capture and storage (CCS) is critical to reaching net zero by 2050, according to the independent experts like the International Energy Agency (IEA) and the UN Intergovernmental Panel on Climate Change. It is a proven method to collect and safely store CO_2 emissions permanently underground. Imperial views CCS as a critical technology to be utilized in our net-zero oil sands goal and is collaborating with government and other third parties to accelerate its deployment in the field.

Our long-standing commitment to research and development (R&D), of more than $2.4 billion over the past 20 years, has resulted in many technology prospects at varying stages of development and commercial deployment. With dedicated research laboratories in both Alberta and Ontario, we are able to bring Canadian perspective to advancing solutions.

World-class renewable diesel complex

Imperial is moving forward with plans to construct a world-class renewable diesel complex at our Strathcona refinery in Edmonton, Alberta. We are excited to leverage hydrogen produced with carbon capture and storage technology and plant-based feedstock to produce lower-carbon intensity diesel fuel that helps our Canadian customers lower their carbon emissions.

Strategy

Imperial's climate strategy

Growth of lower-emissions energy is good for society and is an objective our company supports. Imperial's strategy considers investments in lower-emission solutions while maintaining focus on business competitiveness and generating value for shareholders. Anticipating continued advancements in Canadian public policy and technology, our key climate strategy elements can be described in the diagram below.

Imperial's climate strategy

** Task Force on Climate-related Financial Disclosures*

Emission reduction technology options – leveraging local strengths

Imperial's sustained investment in research and development plays an important role in the development of our pathways to reduce greenhouse gas emissions intensity. Regional strengths shaping our pathways include access to carbon capture and storage geology, hydrocarbon resources, proximity to quality renewables, availability of local plant-based feedstock, infrastructure access, mature regulatory systems, and supportive public policy. Plans consider growth in renewable fuels, next-generation solvent based upstream technologies, carbon capture and storage, low-carbon intensity hydrogen and small modular reactors.

Technology solutions

SHORT TERM

Ongoing

- Boiler flue gas
- Liquid addition to steam for enhanced recovery (LASER)
- Supporting renewable power
- Advanced fuels and lubricants
- Biofuel blending

Underway

- Renewable fuel production with low-carbon intensity hydrogen
- Solvent Assisted Steam Assisted Gravity Drainage (SA-SAGD)
- Coprocessing
- Oil Sands Pathways to Net Zero
- Autonomous haul trucks

MEDIUM TERM

Developing

- Carbon capture and storage
- Sustainable aviation fuel
- Next-generation in situ technologies
  - Cyclic solvent process (CSP) [4]
  - Enhanced bitumen recovery technology (EBRT) [5]
  - Non-condensable gas (NCG) [6]
  - Enhanced late life process (ELP) [7]

LONG TERM

Evaluating

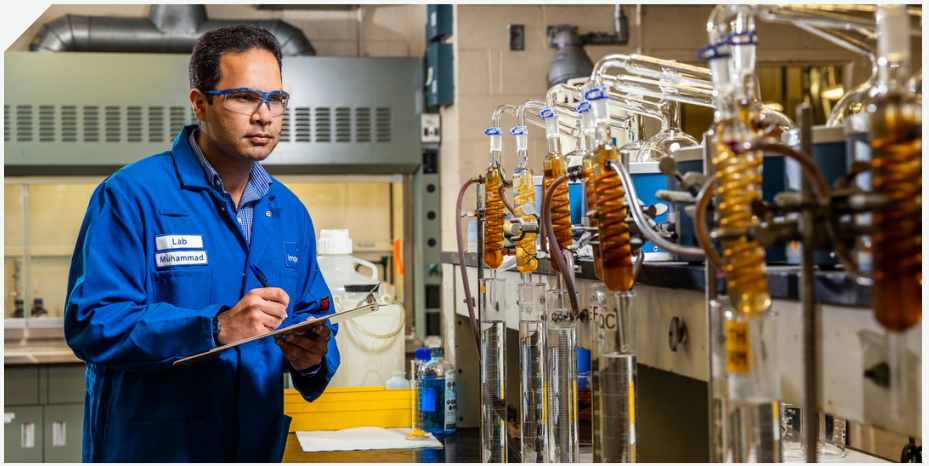
- Low-carbon intensity hydrogen
- Advanced biofuels
- Carbon fibre from bitumen
- Carbonate fuel cell technology
- Small modular reactors (SMR)
- Direct air capture

Innovation

Imperial's future plans are supported by nearly a century of commitment to research and technology development (R&D). We opened Canada's first petroleum research department in 1924 and we continue to operate our dedicated research laboratories in Canada today.

Imperial's Calgary research centre is focused on enhancing environmental performance and improving efficiency in our upstream operations. This centre has delivered more than 50 years of oil sands innovation with noteworthy inventions including cyclic steam stimulation (CSS), steam-assisted gravity drainage (SAGD) and liquid addition to steam for enhanced recovery (LASER). Our Sarnia research centre supports our manufacturing operations, our evolving customer fuel offering and focuses on improving environmental technology.

Our sustained investment of more than $2.4 billion in R&D over the past 20 years plays an important role in progressing the development of promising next-generation technologies that will have a smaller footprint, use less water and could lower greenhouse gas emissions intensity (GHGi) up to 90 per cent.



Innovation focus areas

In situ solvent technologies

Developing and testing technologies that enable oil sands recovery with less energy resulting in reduced greenhouse gas emissions intensity.

Renewable and biofuels

Developing lower-emission products with performance that meets customer needs including renewable diesel, high content biofuels and sustainable aviation fuels for the future.

Industrial process efficiency

Evaluating and testing technology that increases reliability, reduces downtime and optimizes energy use with the ultimate goal of producing what is needed with fewer emissions.

Non-combustible products

Assessing and optimizing processes to turn bitumen into feedstock for high value non-combustible products that are cost effective and could be produced to capture growing markets with scale.

Leveraging ExxonMobil step out carbon abatement technologies

Leveraging ExxonMobil R&D to improve cost efficiency of carbon capture and storage technology with potential to produce low-carbon intensity hydrogen as markets emerge.

Imperial's in situ technology strategy

Transition to lower GHGi bitumen production

Imperial is investing in our oil sands future by developing a suite of game-changing in situ technologies. By matching the right technology to the appropriate reservoir type and production phase, we are able to deliver economically efficient production with lower GHGi through the use of light hydrocarbons (solvents) instead of steam.

- Reservoirs operated at low pressure require **gravity drainage processes** that continuously inject steam/solvent through a horizontal well with oil recovered through a separate parallel well.
- Reservoirs operated at high pressure utilize **cyclic processes** that use a single well and cycle between steam/solvent injection and oil production.

As a follow-up to cyclic processes, **late life processes** are used to enhance sustained production; steam/solvent is injected in wells to flood the reservoir along with oil recovered at adjacent wells.

Legend [4, 5, 6, 7, 8]

- existing — Could be applied to existing production
- new — Could be applied to new production at existing/new fields
- $ — Potential to unlock new resources or increase recovery at existing
- GHGi % — Anticipated GHGi reductions

	steam based		solvent based
Gravity drainage process	**SAGD**	**SA-SAGD**	**EBRT**
Applicability	existing, new	existing, new	existing, new
Technology readiness	Deployed in industry	Commercial ready	Pilot
Potential benefits	Base case	$, GHGi up to 25%	$, GHGi up to 60%
Cyclic process	**CSS**	**LASER**	**CSP**
Applicability	existing	existing	existing, new
Technology readiness	Deployed	Deployed	Commercial ready
Potential benefits	Base case	$, GHGi up to 25%	$, GHGi up to 90%
Late life process	**Steamflood**	**NCG** [6]	**ELP**
Applicability	existing	existing, new	existing
Technology readiness	Deployed	Deployed in industry	Pilot
Potential benefits	Base case	$, GHGi 10 to 20%	$, GHGi up to 70%

Carbon capture and storage (CCS)

Carbon capture and storage is a critical enabler for a lower-emissions future. It is anticipated that "reaching net zero [emissions] will be virtually impossible" without CCS.[9] The International Energy Agency's Net Zero by 2050 report[10] concluded that more than 7.6 billion metric tons per year of CO_2 will be needed to be captured and stored by 2050. By comparison the world's current capacity is about 40 million metric tons of CO_2 per year.[10] The convergence of advantaged technologies with supportive public policy will be needed to accelerate the deployment of CCS.

CCS is a process that captures CO_2 emissions from industrial processes and power plants and transports and injects the emissions into deep geological formations underground for safe, secure and permanent storage. Carbon capture and storage on its own, or in combination with hydrogen production, is among the few proven technologies that could enable reduced CO_2 emissions in difficult to decarbonize industrial applications.

Canada has focused its efforts on a number of technologies, including carbon capture, utilization and storage, low-carbon intensity hydrogen and small modular nuclear reactors with a view to be an energy and climate solutions global supplier. The Global CCS Institute ranks the US and Canada as the top two countries in CCS readiness in terms of deployment, regulation and storage capacity.[11] The Government of Canada has recently announced plans for a federal investment tax credit for CCS projects to support emissions reductions, help advance technology and reduce costs.

Building on an existing regulatory foundation for CCS, the Government of Alberta is interested in advancing a strategic CCS hub concept through a competitive process that is underway. This includes granting carbon sequestration pore space rights, and establishing carbon injection sites at strategic locations across the province.

Carbon capture and storage

CAPTURE
CO_2 is captured, or separated, from the emissions source

TRANSPORT
Captured CO_2 is transported to the storage site

STORAGE
CO_2 is injected into underground reservoirs

MONITOR
Stored CO_2 is monitored to ensure it stays within reservoir

PUBLIC POLICY IS A KEY ENABLER TO TECHNOLOGY DEVELOPMENT AND DEPLOYMENT

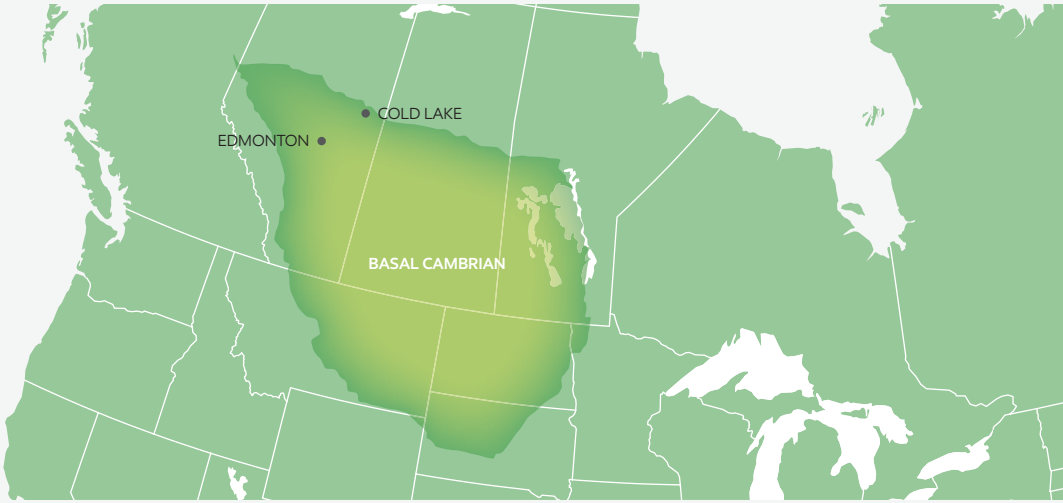
Imperial supports a policy and regulatory framework for carbon capture and storage that would:

- Sustain long-term government support for research and development.
- Provide standards to ensure safe, secure and permanent CO_2 storage.
- Allow for fit-for-purpose CO_2 injection well design standards.
- Provide legal certainty for pore space ownership.
- Ensure a streamlined permitting process for carbon capture and storage facilities.
- Provide access to CO_2 storage capacity owned or controlled by governments.
- Allow for trading of high-quality offsets generated from carbon capture and storage and low-carbon projects.

Imperial is currently assessing potential CCS projects at several of our facilities. Although CCS may be a complex undertaking, the company is able to leverage expertise in geology, reservoir engineering, facility design and project management for these carbon abatement projects. In addition, our Cold Lake operation is located directly along the Basal Cambrian reservoir which has significant capacity and appropriate geology for safe CO_2 storage. As a founding member of the Pathways to Net Zero Alliance, Imperial is collaborating to accelerate CCS for our operated oil sands.

Expanded use of CCS to our downstream operations could support facility emission reduction opportunities including low-carbon intensity hydrogen and renewable fuels. Our recently announced plans to manufacture renewable diesel at our Strathcona refinery will source low-carbon intensity hydrogen that is produced with CCS to reduce the carbon intensity of the fuel.

Collaboration between government, industry and across sectors is critical to create regulatory and policy certainty and a sustainable fiscal framework to ensure the economic viability of CCS projects to attract and retain investment in Canada.



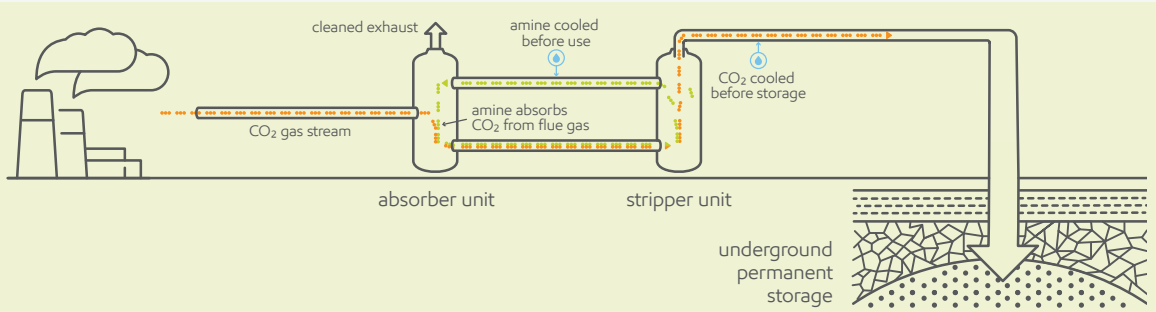
Basal Cambrian reservoir is deep and spans a wide geographic range, including both Cold Lake and Edmonton. It is a proven formation for injecting CO_2, has ideal geology and has a vertical seal more than 100 m thick ensuring injected CO_2 stays sequestered.

Carbon capture technology is not "one size fits all" and CCS project costs can vary considerably, based on the specifics of each stage of the carbon capture supply chain. The CO_2 source stream volume, concentration and impurities could impact the type of technology selected and significantly impact project economics. In addition to technology selection, readiness of the technology can add considerable project risk. Costs are also impacted by the distance the captured CO_2 must be transported from the source to the storage location and storage costs vary depending on location, depth and properties of the storage formation.

Carbon capture technologies

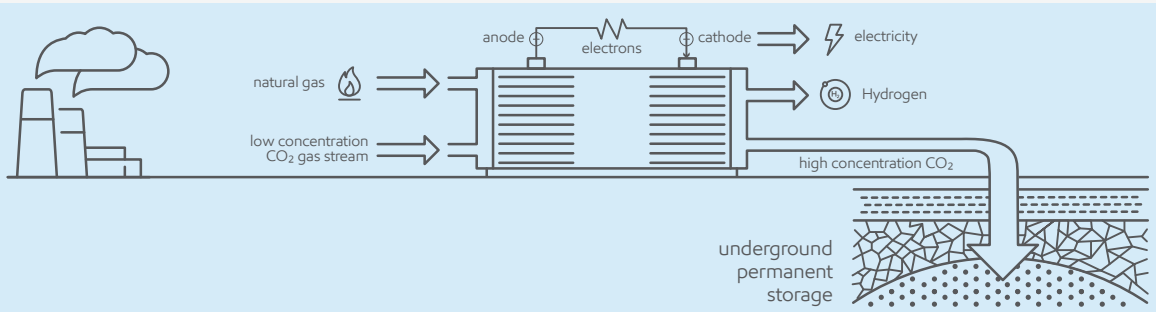
Amine absorption

- Uses amine based solvents to absorb CO_2 from facility emission gas streams that when heated release a pure CO_2 gas stream ready for sequestration
- Is more efficient for higher concentration CO_2 emissions streams



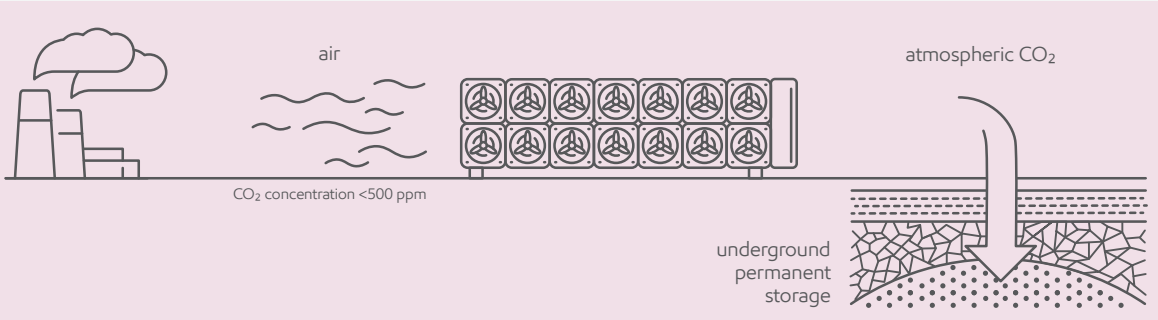
Carbonate fuel cell technology

- Uses electrochemical processes to concentrate CO_2 from facility gas streams
- Appropriate for lower concentration gas streams
- Process produces electricity and low-carbon intensity hydrogen



Direct air capture

- Removes CO_2 directly from the atmosphere using sorbent chemicals
- Cost and energy requirements vary depending on type of technology
- Could provide path to negative emissions



READY

Large scale commercial readiness

IN DEVELOPMENT

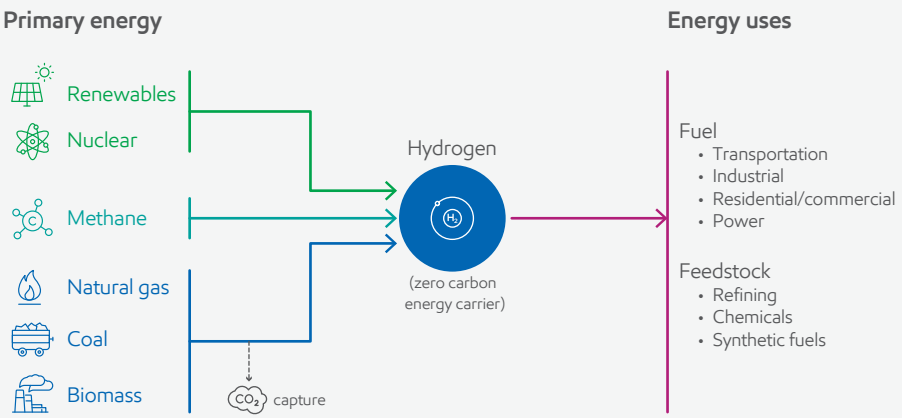
Hydrogen

"Hydrogen is an important part of a clean and secure energy future" [12] with a number of countries with policies directly supporting investment in hydrogen technologies. The Government of Canada recently released its hydrogen strategy outlining opportunities for domestic production and use, as well as export potential for lower-emission hydrogen and related technologies in support of Canada's nationally determined contribution (NDC). Under the Canadian government's transformative scenario, it is estimated that low-carbon intensity hydrogen could make up to 30 per cent of energy needs for Canadian end users by 2050.[13] In addition, the Province of Alberta has recently released its hydrogen roadmap which includes opportunities to integrate with Alberta's existing energy system.

Hydrogen is a zero carbon energy carrier that could serve as an affordable and reliable source of energy for heavy-duty transportation, power generation and industrial processes in the steel, refining and chemical sectors. Hydrogen is difficult to store and transport over long distances because it has very low volumetric density, approximately three times less than natural gas. However, existing natural gas infrastructure has the potential to be used for low-carbon intensity hydrogen with moderate upgrade costs. Canada is currently one of the top ten producers of grey hydrogen (hydrogen made from natural gas without CCS) in the world and is well-positioned to transition to the production of low-carbon intensity hydrogen. By leveraging its robust energy infrastructure, natural gas supply, CCS storage capability, and operating experience, Canada has the opportunity to become a global leader.

The following featured technologies have the potential to reduce carbon emissions by 90 per cent or more, relative to grey hydrogen.[12]

- **Green hydrogen** is produced from low-carbon electricity via electrolysis of water. Considered to have the lowest carbon footprint and is relatively expensive due to renewable energy required and scalability challenges.
- **Turquoise hydrogen** is produced from pyrolysis, directly splitting methane into hydrogen and carbon. Technology is emerging and can be used where there is no renewable energy or CCS.
- **Blue hydrogen** is produced from natural gas reforming coupled with CCS. Could provide an economic and readily available option in many settings and is anticipated to be one of the production pathways going forward.[13]



Blue hydrogen	
Cost* [14]	$$
Commercial readiness	●●●●●
Scalability	●●●●●
Emissions abatement	●●●●●

Turquoise hydrogen	
Cost* [14]	$$$
Commercial readiness	●○○○○
Scalability	●●●●●
	●●●●●

Green hydrogen	
Cost* [14]	$$$$$
Commercial readiness	●●●●●
Scalability	●●○○○
Emissions abatement	●●●●●

Grey hydrogen	
Cost* [14]	$
Commercial readiness	●●●●●
Scalability	●●●●●

** Cost influenced by geographic location, cost of electricity and access to inexpensive natural gas.*

Imperial produces hydrogen today through steam methane reforming with hydrogen making up a portion of our fuel gas at our refineries. As part of our pathway effort, we are currently assessing how low-carbon intensity hydrogen could be used to reduce emissions in our operations. Our upstream facilities are evaluating the feasibility of using low-carbon intensity hydrogen to generate steam instead of natural gas.

Testing the possibilities of green hydrogen

Atura Power and Imperial recently announced plans to study the potential for hydrogen production at Ontario Power Generation's retired facility in Nanticoke, Ontario. The study will focus on commercial and technical aspects of developing a hydrogen facility that could help reduce greenhouse gas emissions in the area's industrial sector in support of Ontario's net-zero emissions future. The study will evaluate the production of more than 3 million kilograms of hydrogen, per year. Study work could start as early as spring 2022, subject to several factors, including government support and approvals.

Leveraging blue hydrogen to produce lower emission fuels

Imperial recently announced plans to manufacture renewable diesel at our Strathcona refinery. Renewable diesel is produced using plant-based feedstock and blue hydrogen to substantially reduce greenhouse gas emissions relative to conventional hydrogen and further reduce the carbon intensity of the fuel produced.

Small modular reactors

Today nuclear power is the second-largest source of low-carbon energy used to produce electricity.[15] Small modular reactors (SMRs) use nuclear fission, similar to large power plants, to safely produce non–GHG emitting heat and electricity. Due to their size, SMRs offer the benefit of portability and could provide an excellent future source of energy for heavy industry or remote locations lacking electricity infrastructure and capacity.

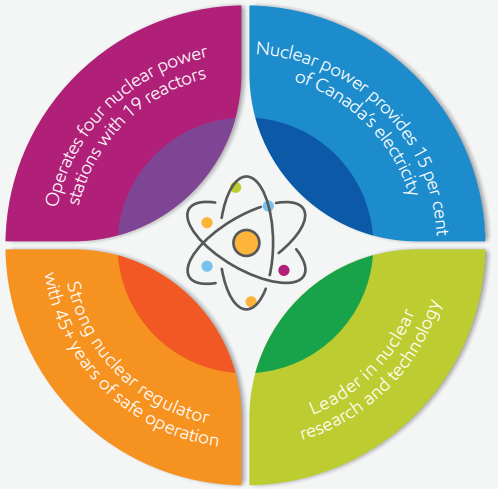
According to the IEA, innovative nuclear power technologies, such as small modular reactors, could offer shorter construction and approval times for capacity, as well as expanding opportunities for nuclear power beyond electricity, for example for heat and hydrogen production, but innovation efforts need to be accelerated to improve their prospects.[16]

In 2020, the Government of Canada released its SMR Action Plan outlining the development, demonstration and deployment of SMRs in Canada. Government is collaborating with multiple stakeholders to advance this technology and have initiated preliminary design reviews by the Canadian Nuclear Safety Commission.[17] As several provinces are actively pursuing SMRs, it is anticipated that Canada's first SMR could be in operation as early as the mid-to-late 2020s.[18]

Imperial is evaluating how SMRs could be used across our facilities to reduce GHG emissions, with some types of SMRs having the potential to replace boilers for steam generation in operated oil sands. Imperial is leading the SMR working group at the Canada's Oil Sands Innovation Alliance (COSIA) focused on understanding integration needs and determining requirements for commercial deployment into Canada's oil sands operations.

SMRs are currently in early stages of development with many possible designs being considered. However, in order for this technology to be cost effective there is a need for a 'fleet based approach' to take advantage of economies of scale. In addition to technology and cost uncertainties, additional challenges include enhancing regulatory frameworks, supporting policies and licensing requirements, ensuring a secure fuel supply and addressing public perception. Further research and continued collaboration with government, industry and stakeholders is key to advancing this technology.

Canada is a leader in safe nuclear energy[19]



Bitumen beyond combustion (BBC)

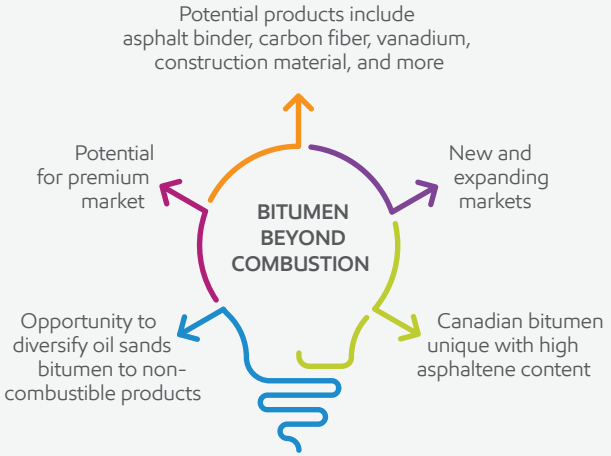
Carbon fibre is an extremely strong, stiff and lightweight material that is resistant to chemicals and is tolerant of wide range of temperatures. Carbon fibre has many applications from car and airplane parts to audio equipment and robotics, plus it's used in reinforced steel for infrastructure and construction.

Bitumen is a form of crude oil that is processed and refined to make products such as gasoline, diesel, aviation fuel and asphalt. Bitumen is made of complex carbon-chain molecules, including the heaviest component known as asphaltenes. Asphaltenes, currently used to make asphalt, have the potential with innovation to become a feedstock for carbon fibre and other non-combustible high value materials like activated carbon.

Diversifying and producing non-combustible products from Alberta's oil sands presents a significant opportunity to reduce greenhouse gas emissions and, at the same time, garner an economic advantage from a growing market segment. According to a 2021 whitepaper by Alberta Innovates, diverting bitumen away from fuel production to make non-fuel products could create more than three times the current value for the resource.[20] The market for carbon fibre alone is anticipated to grow from $3.2 billion (USD) in 2020 to $6.1 billion (USD) by 2026.[21]

Imperial's efforts involve our own in-house BBC research in Sarnia with a goal of creating feedstock for carbon fibre produced with competitive advantage. We are in the process of producing a carbon fibre feedstock in a laboratory pilot. Our efforts include collaborating with ExxonMobil to characterize the feedstock and we will be seeking a third-party carbon fibre manufacturer for spinning and performance testing.

In addition, we are collaborating with Alberta Innovates and Clean Resource Innovation Network (CRIN) by providing samples from our upstream operations to an asphaltene bank to enable researchers from Canadian universities to access the samples and test the feasibility of alternative products. We participate on the Alberta Innovates BBC steering committee, review results of university research and share insights.



Asphalt

Asphalt is an economic, durable paving material made from a blend of heavy-hydrocarbons resulting in high skid resistant, smooth roads for safe travel. Imperial is among the largest suppliers of asphalts in Canada with approximately 25 to 30 per cent of Canadian roads being surfaced with asphalt binders produced from our Strathcona and Nanticoke refineries. In 2019, Imperial expanded our facilities at our Strathcona refinery to increase our asphalt production and improved our logistics at our Nanticoke refinery to better serve our customers.

Imperial's Cold Lake operations produce crude ideally suited for asphalt production and our Sarnia research centre studies asphalt behaviour to increase knowledge and improve product quality and performance. In addition, Imperial collaborates with third parties such as the Asphalt Institute which conducts important research on asphalt performance, pavement sustainability and asphalt road safety.

Asphalt can be recycled by scraping up old road surface and mixing it with new asphalt binder and aggregates. Our Sarnia research team is actively working to enhance the capabilities of recycled asphalt and have shared insight as to how the recycled binder can be effectively blended to maintain pavement performance. On average, new asphalt mixtures are made up of 21 per cent recycled asphalt pavement [22] and recycled asphalt is one of the most commonly recycled products.[23]

Did you know?

Asphalt, sourced from bitumen, offers the following environmental benefits:

- The carbon in the asphalt will never be released into the atmosphere as it is sequestered in the pavement.
- Unlike concrete, 100 per cent of the asphalt can be reused in new pavement at the end of its life, reusing the initial energy invested in the production of the material.[24]

Helping our customers reduce their emissions

Providing lower-carbon products that keep our communities and our customers moving

Fluidized catalytic cracking co-processing and sustainable aviation fuel

Fluidized catalytic cracking (FCC) is a conversion process used by our refineries to convert heavy hydrocarbons into transportation fuel. In 2021, Imperial piloted co-processing trials at our Nanticoke and Sarnia refineries to incorporate bio feedstock, in combination with conventional fluidized catalytic cracking, to produce co-processed commercial fuels at our Nanticoke and Sarnia refineries. Co-processing of bio-feedstock along with the fossil fuels in the FCC will result in the production of transportation fuels that are partly biogenic or renewable.

Results from this trial demonstrated successful production of finished product with reduced carbon intensity.

Imperial is currently exploring producing sustainable aviation fuel using biomass based feedstock.

Biofuel blending

Biofuels help reduce emissions in transportation fuel products and can be blended in various concentrations where B5 represents 5 per cent concentration and B6-B20 represents 6 to 20 per cent concentration of biofuel.

Imperial continues to grow its biofuel blending and distribution capability across Western Canada with five major initiatives including ethanol blended gasoline in Calgary and Nanaimo, biodiesel in Calgary, and ethanol blended premium gasoline in Lougheed and Winnipeg. These projects collectively reduce carbon emissions by 139,000 tonnes per year which is the equivalent of adding approximately 30,200 zero emissions SUV vehicles to our Canadian roads.[25]

Furthermore, a successful biodiesel (B6-B20) pilot was completed in Vancouver. When operating at full capacity, the blending facility is expected to reduce carbon emissions by 27,000 tonnes per year [26] in the Vancouver market.

Synergy Diesel Efficient™

In heavy-duty trucking applications, Synergy Diesel Efficient™ demonstrates an average fuel economy benefit of 2 per cent and lowers NOx and CO_2 emissions by 11 and 2 per cent [27] respectively.

This product is also available to off-road customers under the name Esso Diesel Efficient™. In 2020, Imperial and Canadian Pacific Railway (CP) worked together to implement the use of our Esso Diesel Efficient™ fuel for its locomotive fleet in Canada.

Based on the results of earlier trials, CP expects Esso Diesel Efficient™ fuel to lessen their fuel consumption in 2021 by three million litres, lower their CO_2 emissions by eight million kilograms and reduce particulate matter emissions by 21,000 kilograms.

Synergy Supreme™ premium gasoline

In May 2021 Imperial launched its reformulated Synergy Supreme™ premium gasoline at more than 1,900 Esso™ gas stations and 200 Mobil stations across Canada. Synergy Supreme™ premium gasoline is designed to keep engines three times cleaner,[28] to help them run smoother and get more kilometres per tank.

Furthermore, it contains a friction modifier which is engineered to help reduce wear and tear on a customer's engine to help improve overall performance.

World-class renewable diesel complex

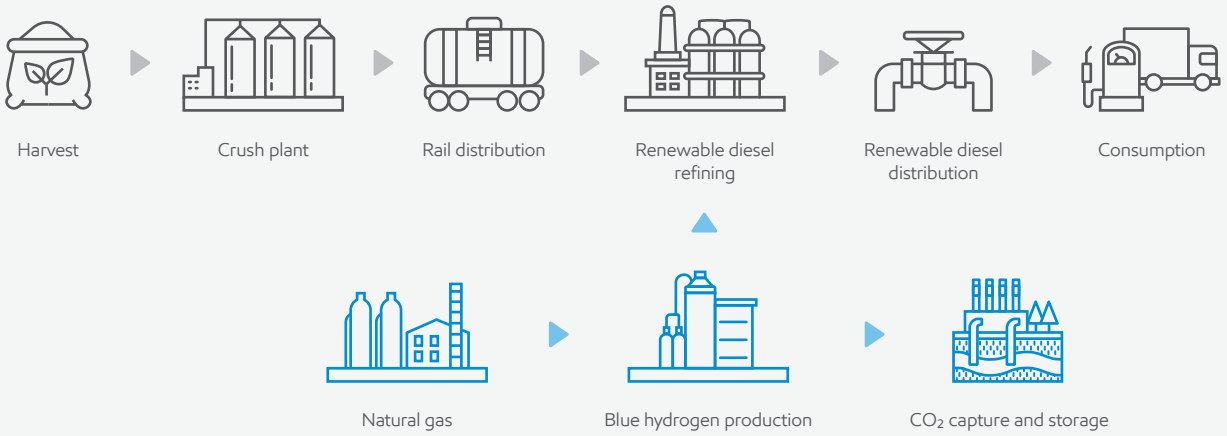
Renewable diesel is an advanced biofuel that reduces greenhouse gas emissions while meeting the same needs of traditional diesel including performance in cold climates.

In August 2021, Imperial announced its intention to move forward with plans to build a world-class renewable diesel complex at our Strathcona refinery near Edmonton Alberta. This is a strategic opportunity to generate value for Imperial, provide lower-carbon intensity fuels for our customers, and support compliance with Canada's upcoming Clean Fuels Regulation.

This project will leverage blue hydrogen produced with carbon capture and storage technology and locally sourced renewable feedstock to help Canada meet its low-carbon ambitions.

The facility is expected to produce about 20,000 barrels, or 3 million litres of renewable diesel, per day by the end of 2024 which will be used to fuel hard to decarbonize sectors, such as road transportation, industry, and Canada's rail network. Imperial's renewable diesel is a premium lower-carbon drop-in fuel that will enable consumers to lower their carbon emissions while meeting all of the challenges of Canada's climate.

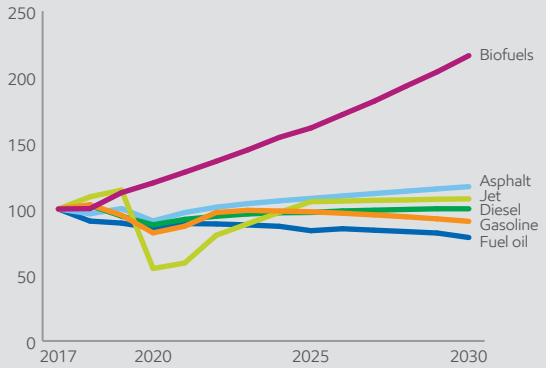
The renewable diesel produced is expected to reduce annual CO_2e emissions by about 3 million tonnes per year compared to conventional fuels.



Demand for lower-emission fuels is expected to grow rapidly, driven by the need for energy-dense, lower-carbon fuels for hard-to-decarbonize transportation such as aviation, marine and heavy-duty trucking.

Potential Canadian market demand growth

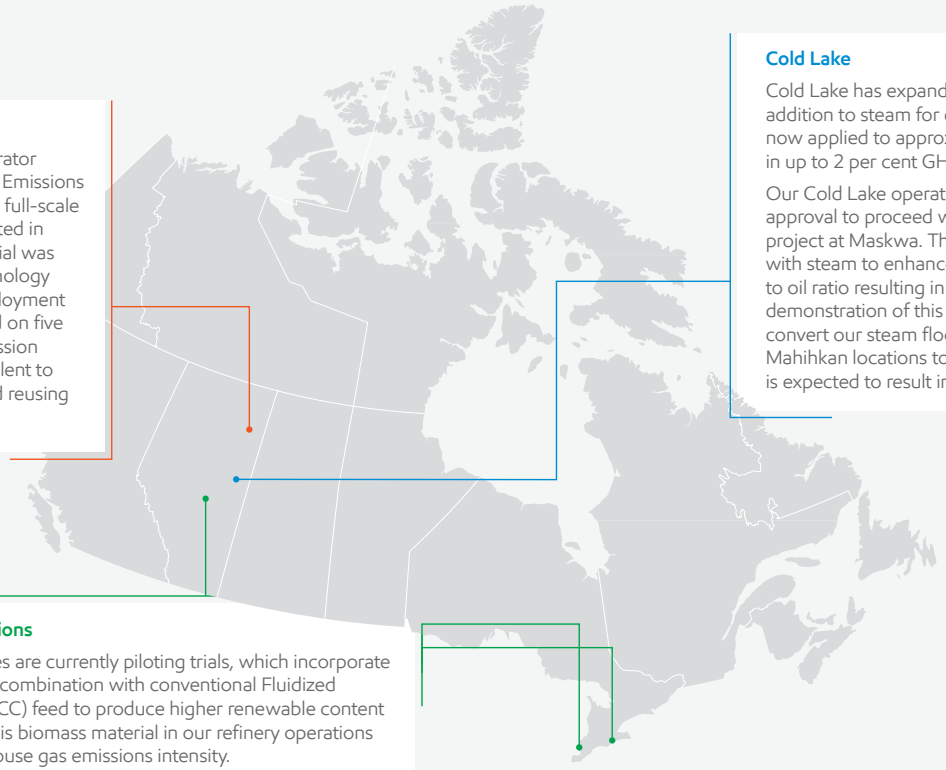
(indexed versus 2017, per cent)



Source: ExxonMobil's 2021 Energy Outlook

Focus on emissions reduction across our company

Imperial continues its focus on improving energy efficiency and reducing GHG emissions at our operations.[1] Sophisticated optimization tools enable our downstream operations to upgrade existing processes and explore the most efficient solutions to reduce emissions in our refineries. Our upstream operations are focused on replacing high intensity steam barrels with lower intensity production by leveraging next-generation technologies combined with carbon capture and storage.



Kearl

Through collaboration between Foresight Cleantech Accelerator Centre, Canada's Oil Sands Innovation Alliance (COSIA) and Emissions Reduction Alberta, Kearl successfully commissioned the first full-scale boiler flue gas unit in Alberta's oil sands. Initial start-up resulted in emissions reductions of up to 35 kT CO_2e/yr. In 2021, Imperial was awarded a grant through the Government of Alberta's Technology Innovation and Emissions Reduction (TIER) fund for the deployment of an additional five waste heat recovery units to be installed on five boilers at Kearl. The six units could result in a combined emission reduction of 220,000 tonnes/year of GHG emissions, equivalent to approximately 48,000 cars off the road in a single year[25] and reusing up to 700,000 m^3 of condensed water per year.

Cold Lake

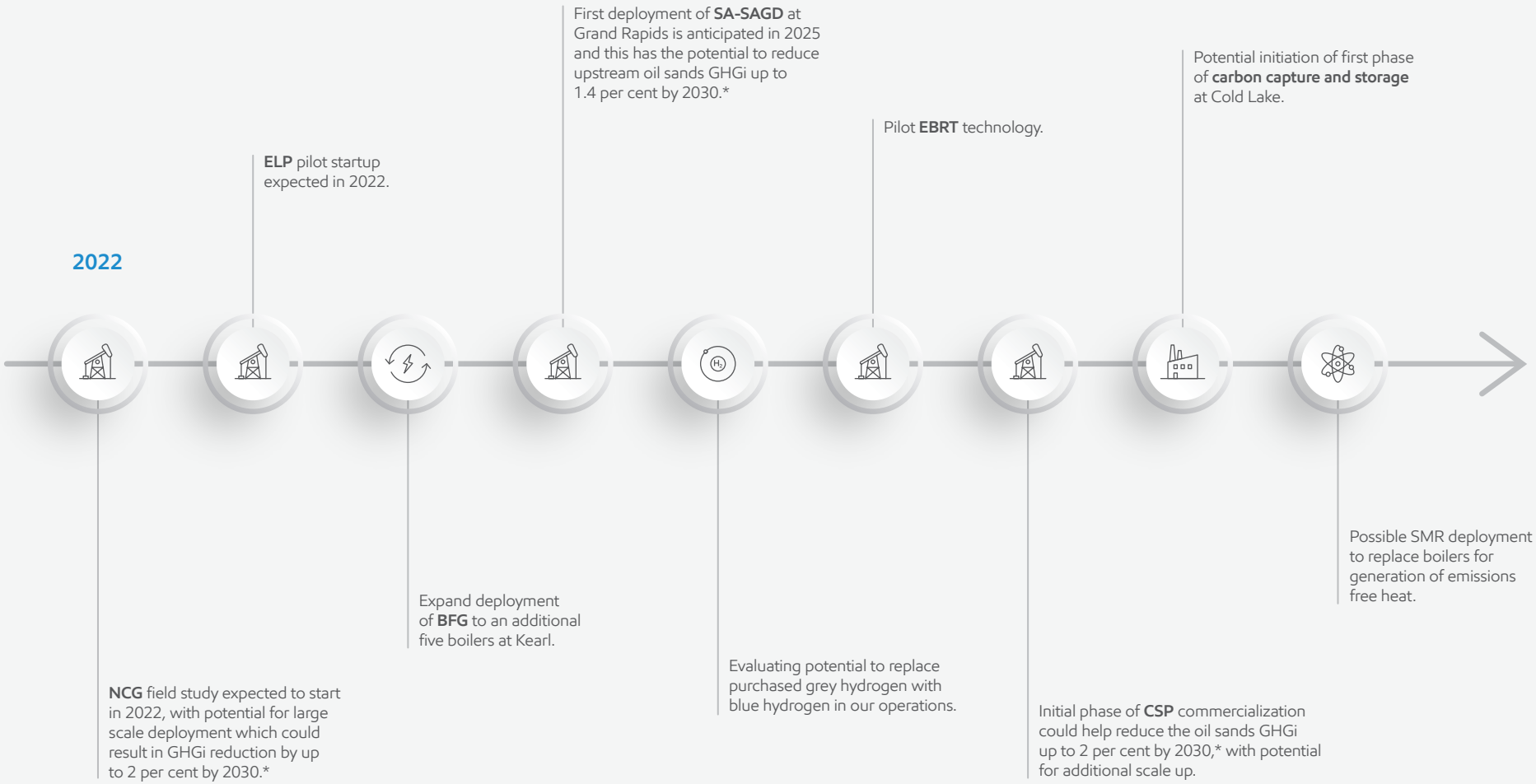
Cold Lake has expanded its commercial application of LASER (liquid addition to steam for enhanced recovery) where the technology is now applied to approximately 10 per cent of production resulting in up to 2 per cent GHGi reduction.

Our Cold Lake operations received full funding and regulatory approval to proceed with a non-condensable gas (NCG) injection project at Maskwa. The project will co-inject a small amount of NCG with steam to enhance the steam flood process to reduce the steam to oil ratio resulting in lower GHGi emissions. Pending successful demonstration of this technology at our site, we expect to fully convert our steam flood operations at both our Maskwa and Mahihkan locations to NCG enhanced steamflood. Full conversion is expected to result in a GHGi reduction of up to 2 per cent by 2030.

Downstream operations

Our downstream sites are currently piloting trials, which incorporate biomass materials in combination with conventional Fluidized Catalytic Cracking (FCC) feed to produce higher renewable content fuel. Incorporating this biomass material in our refinery operations also reduces greenhouse gas emissions intensity.

Potential technology deployment pathway



* Relative to corporate plan and anticipated start-up

Energy transition scenarios

Stress testing resiliency and identifying business opportunities

A successful energy transition ensures affordable, accessible and reliable energy is available to meet society's needs while accelerating to an emissions-free future. Failure to do so could result in loss of energy security and disorderly transition for society.

Energy demand to 2050 is shaped by world population growth from 7.7 to 9.7 billion people, material increase in global domestic products (GDP) and billions of people in developing economies expected to see their incomes grow to levels considered middle class.[29] It is anticipated that global energy demand will likely rise given population growth and the linkage between energy use and living standards.[29]

Progress is anticipated in the development and deployment of electricity from wind, solar, and nuclear, renewable fuels, carbon capture and storage and low-carbon intensity hydrogen as well as lower-emissions oil and natural gas. The International Energy Agency (IEA), indicates that "the World is not investing enough to meet its future energy needs, and uncertainties over polices and demand trajectories creates a strong risk of a volatile period ahead for energy markets."[16]

A shift from more carbon intensive fuel mix to lower-carbon sources is anticipated with all energy sources remaining important through 2050. Canada excels in global ESG ratings with top performance across a full spectrum of factors from environmental policy, to social progress/ welfare, political stability, regulatory oversight, and corporate governance.[30] Canadian oil sands companies have demonstrated strong ESG track records, clear technology pathways to net zero, and an inherently low decline, low sustaining cost nature. If Canadian oil were displaced by some other producing nations, it is unlikely to be produced as responsibly as a barrel from Canada. Fatih Birol, Executive Director of the IEA, has indicated that "the world will need oil and gas even while aiming for net-zero emissions by 2050,"[31] and "would like that production to come from reliable countries with plans to produce it as cleanly as possible, highlighting Canada."[31]

Imperial recognizes the important role it can play by advancing climate solutions within our operations and by providing lower life-cycle emission products to our customers. Imperial uses The Outlook for Energy (Outlook)[32] developed by ExxonMobil as the basis for developing its business plans as it projects our view of future energy supply and demand. The Outlook starts with current factors, such as policy and commercially available technology, and estimates how they might change over time. In contrast, many scenarios start with a hypothetical outcome and work backward to identify the factors that need to occur to achieve that outcome. Future scenarios are considered to stress test assets and identify potential business opportunities.

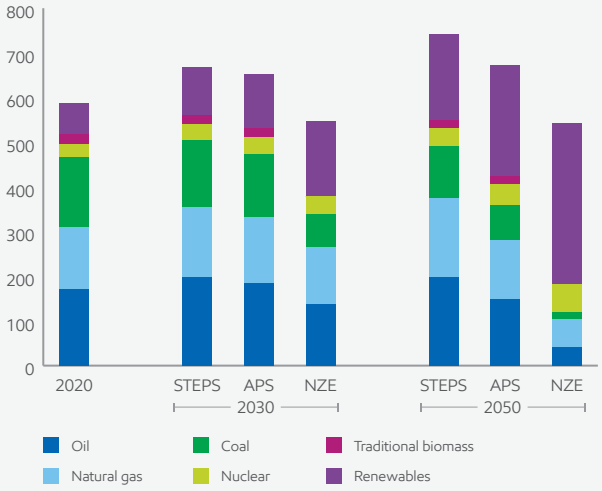
IEA energy transition scenarios

The graph on the right outlines the IEA three main future demand scenarios:

- **Stated Policies Scenario (STEPS)** reflects todays stated NDCs, policies and targets.[16]
- **Announced Pledges Scenario (APS)** assumes all climate commitments made by governments around the world, including NDCs and longer term net zero targets, will be met in full and on time.[16]
- **Net Zero Emissions by 2050 Scenario (NZE)** outlines a narrow pathway to a 1.5°C stabilization in global average temperatures and net zero CO_2 emissions by 2050.[16]

Across these scenarios, a wide range of outcomes can be observed for various fuel sources with oil and natural gas remaining an essential component of the energy mix.

IEA world energy demand mix
(Exajoules)



Source: International Energy Agency (2021), World Energy Outlook (2021), IEA, Paris

Energy Outlook

Considering 2°C scenarios

No single pathway can be reasonably predicted, given the wide range of uncertainties. Key unknowns include yet-to-be-developed government policies, market conditions, and advances in technology that may influence the cost, pace and potential availability of certain pathways. Scenarios that employ a full complement of technology options are likely to provide the most economically efficient pathways.

Following are Paris-aligned scenarios ExxonMobil has assessed and what they could mean for Imperial's business.

IPCC lower 2°C scenarios

In October 2018, the Intergovernmental Panel on Climate Change published a Special Report on *Global Warming of 1.5°C* (IPCC SR1.5)[33] and utilized more than 400 emissions pathways with underlying socioeconomic development assumptions, energy system transformations and land use change until the end of the century. The IPCC report identified 74 scenarios as "Lower 2°C," which are pathways with a 66 per cent likelihood of limiting peak warming to below 2°C during the entire 21st century.

IEA net zero emissions by 2050 scenario

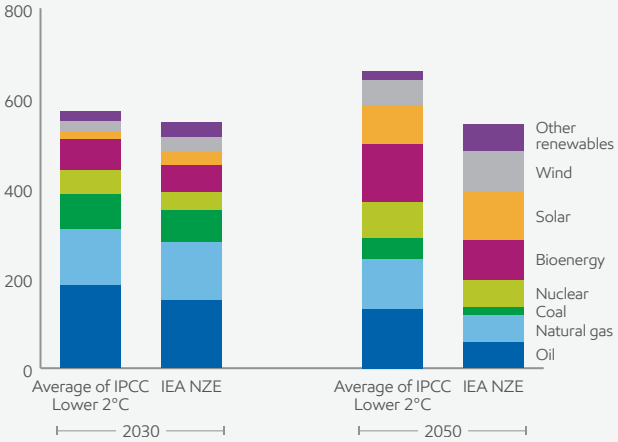
In its 2021 World Energy Outlook, the IEA included its Net Zero Emissions by 2050 Scenario (IEA NZE), which lays out a pathway for the global energy sector to achieve net-zero CO_2 emissions by 2050. The IEA describes the IEA NZE as extremely challenging, requiring all stakeholders – governments, businesses, investors and citizens – to take action this year and every year after so that the goal does not slip out of reach.

The chart at upper right depicts the range of global energy demand in 2050 across the IPCC Lower 2°C and IEA NZE scenarios. As the chart illustrates, predicting absolute 2050 energy demand levels in total and by energy type carries a wide range of uncertainty. Technology and policy assumptions heavily influence particular scenarios.

The chart at lower right illustrates potential global energy-related CO_2 emissions trajectories of these IPCC Lower 2°C scenarios, the IEA NZE, and the Stated Policies Scenario. The Stated Policies Scenario projects emissions at a comparable level generally in line with the IEA NDC submissions. While all Paris-aligned scenarios show reduced emissions over time, the pace of reduction varies widely. The IEA NZE emissions pathway is clearly much more aggressive than most of the IPCC Lower 2°C scenarios.

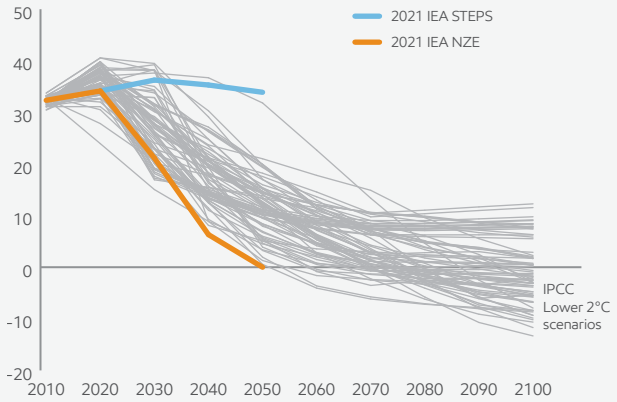
Global energy demand mix across Paris-aligned scenarios

(EJ)



Global energy-related CO_2 emissions[34]

(Gt CO_2)



Source: ExxonMoble 2021 Outlook for Energy; IEA World Energy Outlook 2020, IPCC SR1.5

The IPCC Lower 2°C scenarios produce a variety of views on projected global energy demand in total and by specific types of energy. This report uses the average of the scenarios' growth rates per energy source to consider potential impacts on energy demand.[35] This is shown together with the growth rates of the IEA NZE scenario in the upper right hand chart.

These scenarios project total primary energy demand on a worldwide basis to only marginally increase, from zero to 0.5 per cent per year on average from 2010 to 2050, assuming energy efficiency improvements almost entirely offset population and economic growth. Expected demand and technologies deployed in 2050 vary by model and energy type (see upper right chart):

- **Natural gas:** The IPCC Lower 2°C scenarios forecast demand in 2050 similar to 2010 levels. The IEA NZE places it at about 50 per cent of 2010 levels.
- **Oil:** Demand is projected to decline by 1 per cent per year in the Lower 2°C scenarios and 2.8 per cent per year in the IEA NZE.
- **Non-bio renewables:** The IPCC Lower 2°C and IEA NZE scenarios foresee increases of 6-7 per cent per year for wind and solar.
- **Nuclear:** The IPCC Lower 2°C scenarios project an annual growth rate for nuclear of above 2 per cent; the IEA NZE projects an increase of 1.8 per cent per year.
- **Coal:** Demand is expected to decline by 3.5 per cent per year in the IPCC Lower 2°C and 5.5 per cent in IEA NZE.
- **Bioenergy:** The IPCC Lower 2°C scenarios project growth of about 2.5 per cent per year, versus 1.2 per cent for the IEA NZE.

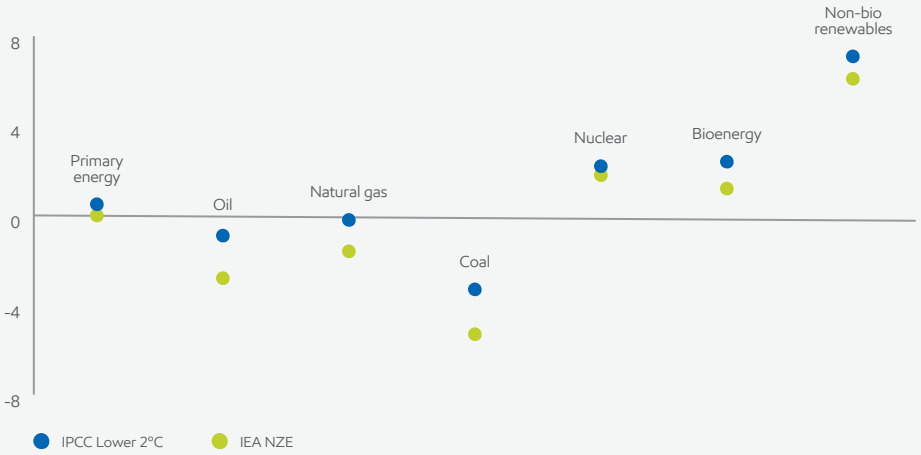
Wide variety of 2050 energy mix across Paris-aligned scenarios

	IPCC Lower 2°C Average	IPCC Lower 2°C Range	IEA NZE
O&G	36%	16-57%	22%
Coal	7%	0-16%	3%
Nuclear	12%	2-22%	11%
Bioenergy	25%	9-52%	16%
Non-bio renewables	20%	7-43%	48%

Source: IEA 2021 WEO, IPCC SR1.5, ExxonMobil Analysis

2010-2050 growth rates by energy type in two Paris-aligned scenarios (CAGR)

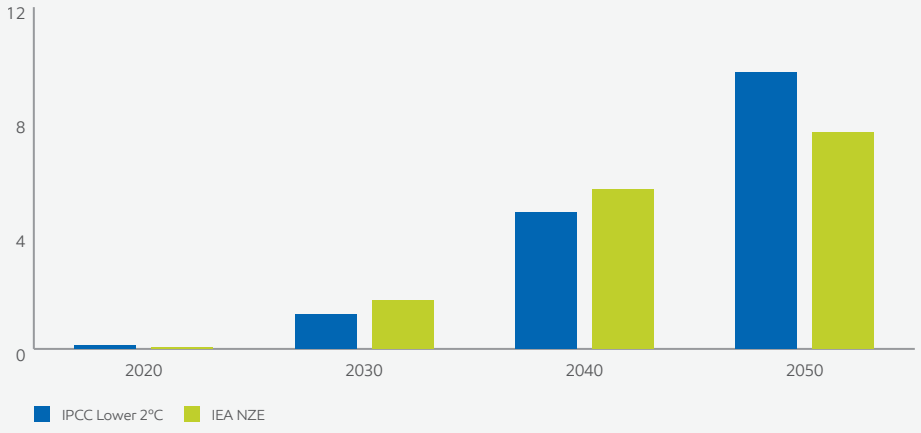
(per cent change per year)



Source: IEA 2021 WEO, IPCC SR1.5, EM analysis

CCS growth required in Paris-aligned scenarios

($Gt\ CO_2$)



Source: IEA 2021 WEO, IPCC SR1.5

Oil and natural gas investment needed to ensure reliable affordable energy supply

In all IEA scenarios, material investment in oil and gas is required to offset the rate of natural decline from producing fields: [16]

- **STEPS** US$650-700 billion per year
- **APS** US$495 billion per year
- **NZE** US$235 billion per year

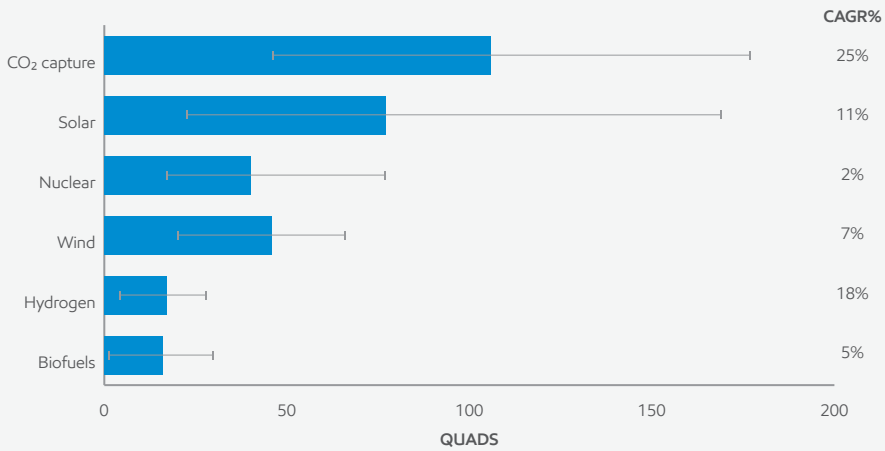
In fact, without investment, only about 50 per cent of world oil demand would be met in 2050 under the IEA NZE scenario. Natural gas is projected to have lower demand reductions due to its many advantages, including lower greenhouse gas emissions.

The various third-party scenarios illustrate each transition pathway can be very different with a wide range of uncertainty based on the pace of transition policy developments and scaling of technologies. It also is likely that the energy transition will be regionalized, based on access to infrastructure, technology, policy, and resources. For instance, the transition is expected to evolve differently based on relative proximity to quality wind/solar resources, hydrocarbon resources, and carbon storage sites, among others.

Limiting the supply of oil and natural gas prematurely, when these energy sources continue to be essential, could lead to shortages, regressive inflationary pressure, or an increase in societal greenhouse gas emissions as previously discussed.

Similarly, these scenarios would imply a range of lower-emissions growth opportunities as highlighted in the chart, which looks across the IPCC Lower 2°C scenarios and illustrates the average (blue bars) growth potential of various lower carbon solutions. While all these lower-carbon solutions are needed, the grey bars represent the wide range of growth potential across the IPCC Lower 2°C scenarios. To support further deployment of these technologies at scale, additional policy is needed to incentivize investments and influence consumer behavior. Striking the right balance in investments at a pace consistent with policy support is crucial.

Growth of lower-carbon solutions between 2020 and 2050 in IPCC Lower 2°C scenarios



Source: IPCC SR1.5, Lower 2°C

Error bars represent 10th percentile to 90th percentile scenario

Monitoring for potential shifts in the energy landscape

Using company and third-party sources, Imperial monitors a variety of signposts that may indicate a potential acceleration in shifts in the energy landscape. For example, a key consideration in advancing the energy transition is the cost of new technologies compared to existing or alternative energy sources. Changes in relative cost may further increase shifts in the global energy mix.

They include:

- Increasing electrification of energy systems and technology developments that reduce costs and increase the reliability and capacity of energy storage.
- Development of scalable alternative energy technologies such as advanced biofuels, leading to displacement of gasoline and distillate in the fuels market.
- Advances in carbon capture and storage technology to lower cost and enable lower-emission hydrogen production.
- New, more ambitious NDCs, along with broad implementation of significant policy and regulatory initiatives, such as carbon pricing.

Potential upstream impacts on proved reserves – testing the energy landscape

At the end of 2020, Imperial's proved reserves totaled about 2.6 billion oil equivalent barrels [36] predominantly consisting of oil sands resources. These proved reserves are assessed annually and disclosed in accordance with National Instrument 51-101.

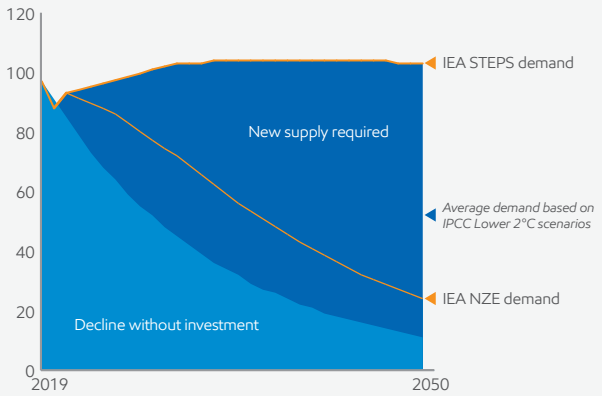
Based on currently anticipated production schedules, Imperial estimates that in 2040 more than two thirds of its year-end 2020 proved reserves will have been produced. As Imperial continues to develop projects over time, we expect that annual production estimates will change.

Significant investment is still needed in all Paris-aligned scenarios. In the IPCC Lower 2°C scenarios, average global oil demand is projected to decline from 97.4 million barrels per day in 2019 to about 52 million in 2050. The IEA NZE scenario projects about 24 million barrels per day of demand in 2050. However, without future investment and due to natural field decline, world oil production would be expected to drop to about 11 million barrels per day. Even in the IEA NZE scenario, additional investment of approximately $11 trillion through 2050 would be required in both oil and natural gas development to meet the world's energy demand.[37]

Although Imperial's upstream assets [36, 38] may be subject to more stringent climate policies in the future, it is the company's view that these assets will continue to improve in both financial and GHGi competitiveness. Operational knowledge gained over time, and a relentless focus on efficiency, cost reductions and deployment of pace-setting technologies, matched to high quality resources will help sustain the company's strong competitive position.

Global oil supply estimates

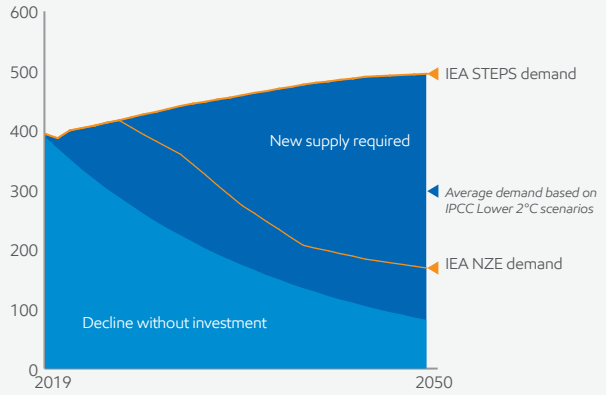
(million oil-equivalent barrels per day)



Source: IEA 2021 WEO, IPCC SR1.5, Lower 2°C

Global gas supply estimates

(billion cubic feet per day)



Source: IEA 2021 WEO, IPCC SR1.5, Lower 2°C

Finding solutions with partners and policy makers

Canadian climate-related policy

The Government of Canada (GoC) is committed to moving towards net-zero emissions by 2050 and has established a series of regulations and reduction targets to meet this goal. In 2021, the GoC announced its intention to increase its nationally determined contribution (NDC) to reduce GHG emissions by 40 to 45 per cent below 2005 levels, by 2030.[39] In addition, Canada has joined the Global Methane Pledge and shares its objective of reducing total methane emissions by at least 30 per cent below 2020 levels by 2030 and has announced that methane emissions from oil and gas will require a 75 per cent reduction by 2030.[40]

Carbon pricing is viewed as a critical policy element with pricing expected to rise by $15/tonne each year, starting in 2023 at $65/tonne, until it reaches $170/tonne[39] in 2030. In order to protect competitiveness of emissions intensive trade exposed (EITE) industries from jurisdictions without carbon pricing, the federal policy provides free allowances for 80 to 95 per cent of a company's historical carbon emissions. In Alberta and Ontario equivalent policies are in place, with slight differences as it relates to the per cent free allowances and the development of the historical baseline. As industry decarbonizes further, Canada is planning to reduce the free allowances and is evaluating tools such as Border Carbon Adjustments as a means to address the rising carbon costs.

Canada's Clean Fuel Regulations will require liquid transportation fuels, excluding aviation fuels, to reduce in carbon intensity reaching 15 per cent below 2016 levels by 2030.[41] Fuel suppliers will be able to achieve this carbon intensity reduction through multiple pathways including by reducing the carbon emissions at their refineries, blending in lower-carbon intensity biofuels, or generating credits through the electrification of the transportation sector.

The Government of Canada has also set a mandatory target for all new light-duty cars and passenger trucks sales to be zero-emission by 2035, accelerating Canada's previous goal of 100 per cent sales by 2040.[42]

Imperial perspective

Imperial supports the Paris Agreement[3] and Canada's ambition to achieve net-zero emissions by 2050. We share a common mindset that growth of lower-emissions energy supports society's climate goals, while recognizing the increasing global need for reliable and accessible energy. We encourage policy makers to implement policies that are globally competitive and attract and retain investment in Canada.

We support a transparent, economy-wide price on carbon to harness the power of the marketplace, allocate resources and advance low-carbon technologies. It is our view that Border Carbon Adjustments, on both imports and exports, could be an effective tool to ensure Canadian industry continues to be globally competitive provided they are well designed and work seamlessly with other government policies.

We support the Clean Fuel Regulations and the lifecycle approach which takes into account the emissions associated with all stages of fuel production and use. Imperial views the Clean Fuel Regulations as a cost effective mechanism to drive innovation, deliver emission reductions in the transportation sector and encourage efficient use of fuel by consumers.

It is our view that multiple actions across the economy are being pursued by the GoC in support of Canada's new 2030 goals. It is noted that not all sectors or individual businesses are required to be at the same levels in 2030; some sectors will deliver more emissions reductions than others in that timeframe. For example transitioning from coal to natural gas for electricity generation will lead to large reductions in the period up to 2030. Furthermore, it is anticipated that emission reductions will not follow a linear profile as major abatement projects are likely to create step-changes in emission reductions when implemented.

Our company continues to work towards reducing methane emissions to meet Canadian methane target reduction by actively exploring emerging technologies to improve methane detection for leak detection and repair and ongoing partnerships and association participation.

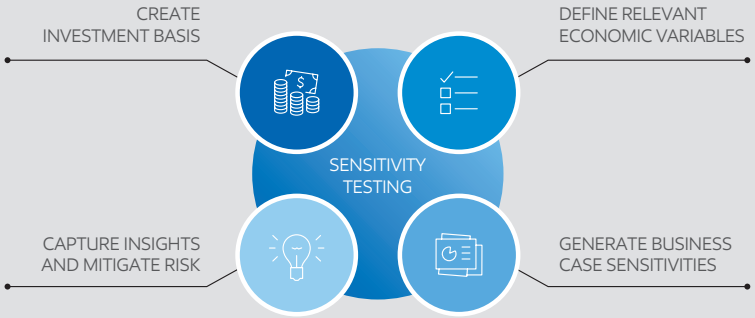
Geography and climate have played a major role to determining the transportation needs of Canadians. As transportation vehicles transition to zero emissions, it is important that consumers are given a suite of choices including hybrids, renewable fuels, electric vehicles and hydrogen so they are able meet their individual needs and reduce their emissions.

INVESTMENT SENSITIVITY TESTING CONSIDERING CLIMATE PUBLIC POLICY

Imperial has an objective of strengthening its competitive position and focusing on increasing cash flow while delivering industry-leading environmental performance enhancements and economic returns over the business cycle.

We test our capital investments against many uncertainties, which may include but are not limited to: technology, cost, geopolitics, material services, labour availability, infrastructure and logistics, regulatory, and environment including carbon pricing and public policy.

As part of Canada's NDC, Canadian federal and provincial governments have defined the price on carbon going forward. Imperial's significant investments include and consider these inputs.



Engaging on climate-related policy

Imperial is committed to helping develop effective policy to help address climate change, engaging directly with trade associations, Indigenous communities, governments, policy makers and other third parties to contribute to the development of effective climate-related policies. We actively monitor public policy to inform our business plans and to assist policy makers seeking our expertise. We encourage policy makers to focus on reducing the greatest amount of emissions at the lowest cost to society which includes options to support the transition that is needed for a net-zero future.

The company believes effective policies are those that:

- Promote global participation;
- Allow market prices to drive the selection of solutions;
- Ensure a uniform and predictable cost of GHG emissions across the economy;
- Minimize complexity and administrative costs;
- Maximize transparency;
- Provide flexibility for future adjustments to react to developments in technology, climate science and policy.

Imperial's approach to engagement

Working solutions with partners and customers

Imperial actively partners with academic institutions, industry peers and other third parties to accelerate the pace of environmental performance improvement in Canada. Imperial is a charter member of Canada's Oil Sands Innovation Alliance (COSIA), founding sponsor of the Institute for Oil Sands Innovation (IOSI) at the University of Alberta, and active participant in the Clean Resource Innovation Network (CRIN).

Canada's energy sector is an innovation success story with a collaborative approach to leveraging great ideas from many sources. Imperial sees great value in partnering with third parties to share knowledge and spark innovation to reduce our carbon footprint.

Examples include:

- Imperial's Sarnia refining and chemicals site entered into a partnership with Enel X, a global energy company, for the installation of an onsite 20 MW/40 MWh battery storage system, known as a behind-the-meter energy storage solution (BESS). This system is designed to charge overnight while the province is operating on lower-carbon electricity powered by renewables such as wind, nuclear and hydro and will discharge electricity during peak energy hours, reducing our overall draw from the provincial grid when natural gas generation is high.
- In Alberta, Imperial signed a greenhouse gas emission offset agreement with Potentia Renewables from the Wheatland Wind Project, a new 122-megawatt wind farm in east central Alberta.
- We continue to work with GHGSat, a global emissions monitoring company, to utilize satellite technology for methane emissions monitoring.
- We are evaluating the use of legacy lands, such as our former Dartmouth refinery and brownfield gas plants, for use of third-party development of solar farms.
- Imperial recently joined as an associate member of the newly formed Canadian Council for Sustainable Aviation Fuels.

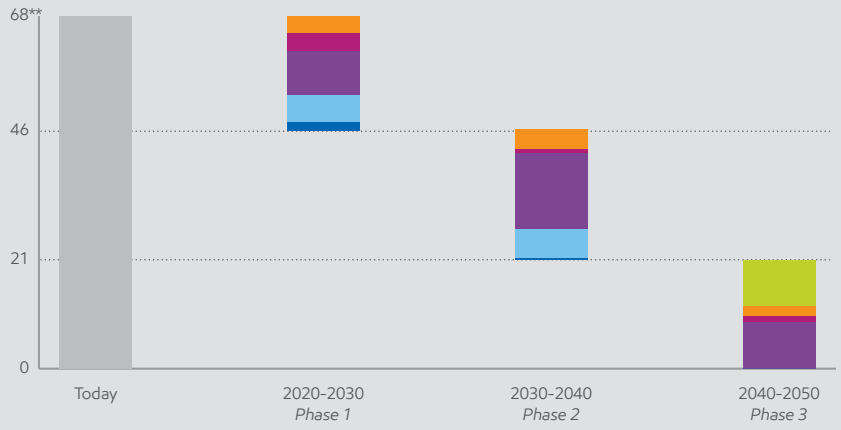
Oil Sands Pathways to Net Zero

Canadian Natural | cenovus ENERGY | ConocoPhillips Canada | Imperial | MEG Energy | SUNCOR

Imperial is a founding member of the Oil Sands Pathways to Net Zero Alliance. We, along with our partners, make up 95 per cent of oil sands production in Canada. Together the partners will work along side the Government of Canada and the Government of Alberta toward the goal of achieving net-zero GHG emissions from oil sands operations by 2050, collectively reducing an estimated 68 Mt/CO_2e per year.

Pathways to net zero – proposed emissions reductions by phase

(Mt CO_2e/yr) *



Source: www.oilsandspathways.ca; November 2021

* Magnitude of reductions in each decade can be adjusted based on chosen investment level.
** Alberta GHG emissions for 2018, plus 1 Mt of CO_2e from incremental upgrading excluded under the 100 Mt cap methodology.
*** Carbon capture in Phase 1. In Phase 2 or 3, could include carbon capture technology, nuclear and/or hydrogen.

Digital technology innovation

Imperial is advancing digital technologies, including data analytics, artificial intelligence and machine learning, to gain deeper insight into our operations. Benefits include maximized oil recovery and production, increased reliability and improved efficiency resulting in greenhouse gas emissions intensity reductions. Our team of data science experts, IT and business professionals are working together to leverage this technology to enable quicker data-driven decisions to generate value.

Optimizing steam deployment at Cold Lake

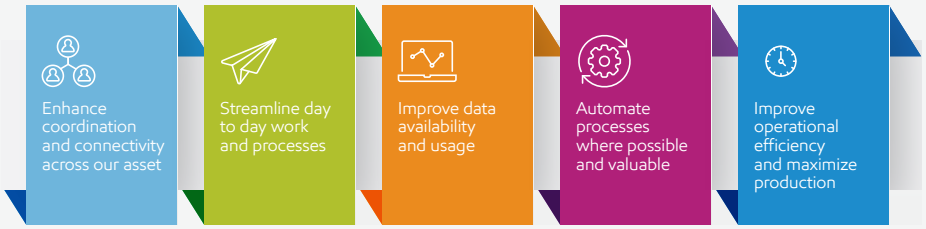
By using machine learning algorithms and advanced analytics, we are able to optimize the placement of steam into the reservoir and deliver more production for the same amount of steam.

Improving efficiency across our operations

Our Kearl operations are leveraging machine learning and mathematical optimization to better understand the productivity of heavy equipment and operator characteristics to improve efficiency and reduce idle time. In addition, anticipated full automation of our haul fleet could result in approximately 20,000 tonnes of emissions avoidance each year.

Our downstream and chemical operations are developing optimization tools to upgrade existing processes and improve energy efficiency.

Leveraging digital technologies to:



Supporting emissions detection, quantification and leak repair

In 2020, Imperial initiated cost effective, aircraft-based, next-generation remote sensing technology to detect and measure methane emissions to more efficiently identify leaks from equipment and support timely repair to reduce fugitive GHG emissions.

In collaboration with COSIA we are evaluating drone-based technologies that can accurately measure fugitive emissions from oil sands mining operations. This technology is expected to provide better, more accurate quantification than current methods due to the aerial coverage.

Metrics & targets

Imperial has consistently reported Scope 1 and 2 GHG emissions as they provide an accurate reflection of the company s direct effort to manage, measure and reduce emissions in our operations. The criteria for reporting these emissions is well-established, transparent and consistent across sectors.

Scope 1 – Direct GHG emissions from company operations, such as fuel consumption in a boiler or mining truck fleet.

Scope 2 – Indirect GHG emissions from energy purchased by the company, such as electricity from the grid.

2023

On track to meet emissions intensity 10% reduction goal for operated oil sands

2030

Oil sands emissions intensity anticipated to decrease 30%

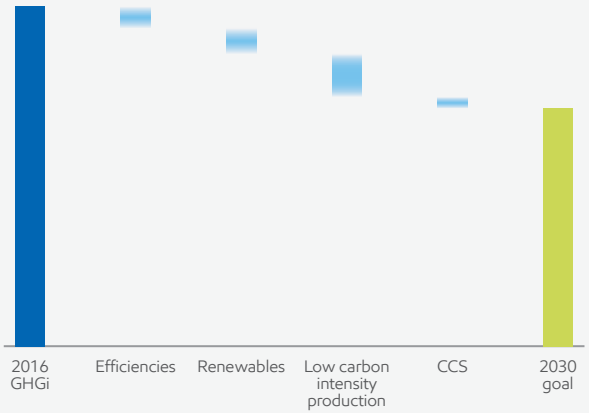
2050

Goal to achieve net zero emissions in oil sands operations by 2050 through collaboration with government and other industry partners

From 2016 levels and incudes scope 1 and 2 greenhouse gas emissions from operated oil sands.

Accelerating emission reductions with our 2030 reduction plan

Operated oil sands plan to 2030



Establishing clear measurable goals and specific plans and actions

Near-term goal

Imperial is on track to meet its 2023 year-end greenhouse gas emissions intensity (GHGi) goal of 10 per cent reduction for operated oil sands facilities by the end of 2023, compared to 2016 levels.[1, 2] This improvement builds on our previous success of reducing GHGi in these assets by more than 20 per cent between 2013 and 2016.

Medium-term goal

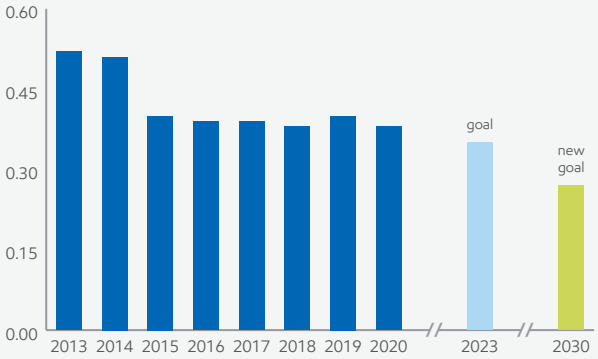
By the end of 2030, Imperial expects to reduce GHGi of its operated oil sands facilities by 30 per cent compared with 2016 levels.[1, 2] These emission reductions plans are challenging and require innovative technology solutions developed in collaboration with policy makers, industry and other stakeholders to accelerate the deployment of lower-carbon technologies. The company plans to achieve this reduction through the implementation of lower GHGi next-generation technologies at our Cold Lake operation, efficiency improvements at all our sites, and through the use of carbon capture and storage.

Long-term goal (2050)

Over the last several years Imperial has created GHG reduction pathways for our operated oil sands that have informed our plans and have culminated in our long-term goal to achieve net-zero emissions[1] in our operated oil sands by 2050 through collaboration with governments and other partners.

Operated oil sands GHG emissions intensity[43, 44, 45]

(metric tonnes CO_2e/m^3 upstream production)

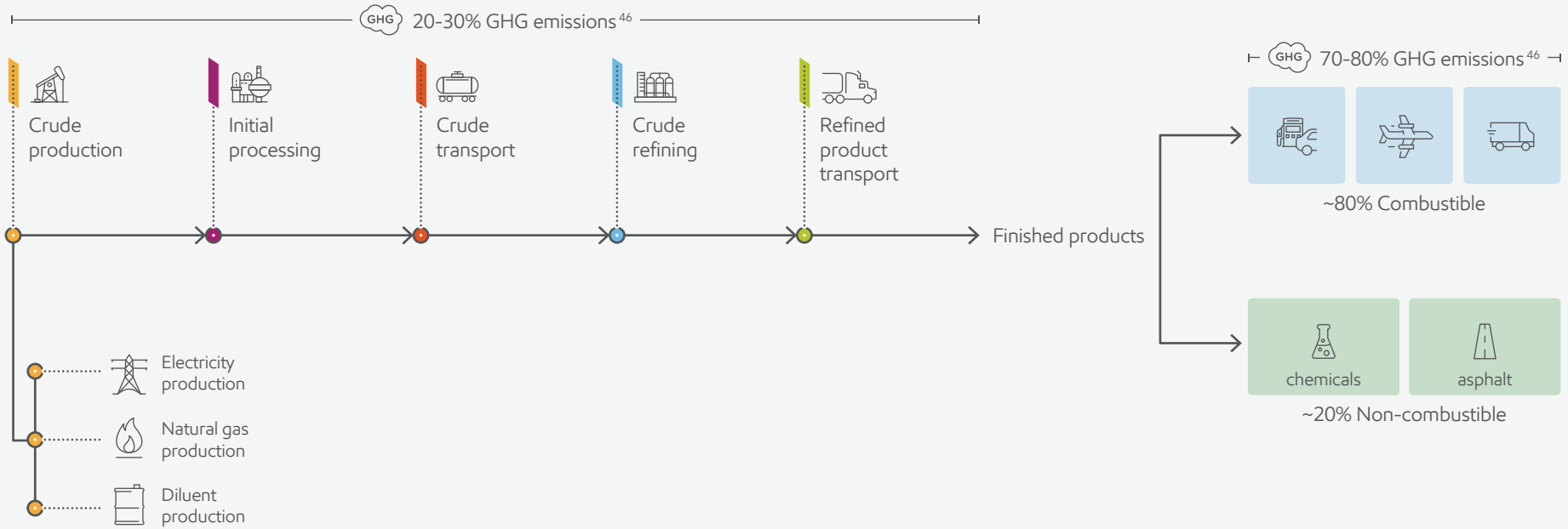


Life-cycle assessment (LCA)

Helping customers better understand their choices

LCA is the preferred methodology to estimate the environmental impact of energy processes and products. If looking at the full life cycle, it is important to include all emissions across the life cycle of each option when comparing different energy technologies. Every step that emits any type of GHG emission would therefore be included to properly estimate the future GHG emissions impact. This may help consumers better understand the choices they are making based on the full impact of a good or service. For the full life cycle of petroleum products, LCA includes GHG emissions associated with production of the resource, refining and transportation steps and lastly consumption of the product by the end user (e.g., fuel in a vehicle or power plant).

Life cycle assessment (GHG emissions) for petroleum-based products



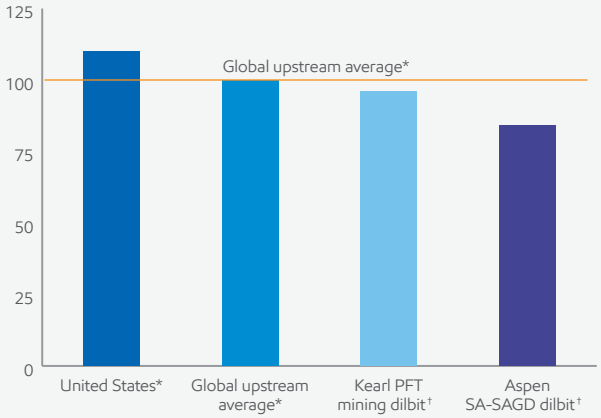
Imperial was pleased to participate in a life-cycle assessment study led by scientists from the University of Calgary, Stanford University and the University of Toronto in collaboration with government agencies (Alberta Innovates, Emissions Reduction Alberta, and Natural Resources Canada), LCA experts, industry groups and other oil sands producers.[47]

This study, using real operational data to improve upon open source model GHG estimates or "ground truthing", could not have been successful without the collaboration of these knowledgeable participants. The published report, demonstrating GHG performance of various oil sands technologies including Imperial's paraffinic froth treatment (PFT) and solvent assisted-steam assisted gravity drainage (SA-SAGD) processes, was released in December 2020 and the results were published in the Journal of Cleaner Production in early 2021.

The results showcase Alberta's global leadership in transparent reporting of its emissions and operational data with improved modelling outputs demonstrating positive correlation (96 to 99 per cent) with actual operational and regional data. The resulting carbon intensity (CI) of Kearl's oil sands mining operation is better than the global upstream average and continues to improve. Among the facilities modelled, the Kearl PFT dilbit had the lowest upstream GHG emission intensity, estimated at 54.7 kg CO_2e/bbl of crude. Of significance, next-generation in situ technologies using light hydrocarbons (solvents) instead of steam to recover bitumen are anticipated to result in intensities lower than the global upstream average.[48]

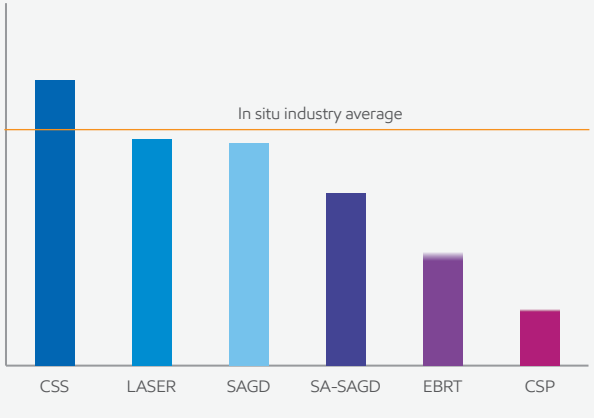
A second phase of the study is currently underway and results are expected in 2022.

Global upstream carbon intensity
(normalized)



* Masnadi et al. (Science, 2018)
† Sleep et al. (Journal of Cleaner Production, 2021)

Imperial's in situ technologies
(normalized)



Source: Modified from Boone World Heavy Oil Conference, 2012

Performance data

Imperial is committed to providing our shareholders and stakeholders with meaningful information about our business. Our sustainability performance table and metrics include environmental, social and governance data up to year-end 2020.

ENVIRONMENT[1]	2016	2017	2018	2019	**2020**
GHG emissions and energy consumption[2]					
Direct GHG emissions – including Cogen					
Downstream & Chemical *(million metric tonnes of CO_2e)*	4.8	4.7	4.7	4.4	**4.6**
Upstream *(million metric tonnes of CO_2e)*	8.2	8.4	8.4	8.7	**8.4**
Operated oil sands *(million metric tonnes of CO_2e)*	8.1	8.3	8.4	8.6	**8.4**
Imported electricity and associated indirect GHG emissions					
Downstream & Chemical – imported electricity *(million MWhr)*	1.07	1.04	1.09	1.09	**1.07**
Downstream & Chemical – associated indirect GHG emissions *(million metric tonnes of CO_2e)*	0.39	0.39	0.40	0.40	**0.40**
Upstream – imported electricity *(million MWhr)*	0.83	0.92	0.95	1.07	**1.05**
Upstream – associated indirect GHG emissions *(million metric tonnes of CO_2e)*	0.31	0.34	0.35	0.39	**0.39**
Operated oil sands – imported electricity *(million MWhr)*	0.83	0.92	0.94	1.07	**1.05**
Operated oil sands – associated indirect GHG emissions *(million metric tonnes of CO_2e)*	0.31	0.34	0.35	0.39	**0.39**
Exported electricity and associated GHG emissions					
Downstream & Chemical – exported electricity *(million MWhr)*	—	—	—	—	**0.01**
Downstream & Chemical – associated GHG emissions *(million metric tonnes of CO_2e)*	—	—	—	—	**—**
Upstream – exported electricity *(million MWhr)*	1.48	1.45	1.55	1.50	**1.45**
Upstream – associated GHG emissions *(million metric tonnes of CO_2e)*	0.55	0.54	0.57	0.56	**0.54**
Operated oil sands – exported electricity *(million MWhr)*	1.47	1.45	1.55	1.49	**1.45**
Operated oil sands – associated GHG emissions *(million metric tonnes of CO_2e)*	0.55	0.53	0.57	0.55	**0.54**
GHG emissions[3]					
Downstream & Chemical *(million metric tonnes of CO_2e)*	5.2	5.1	5.1	4.9	**5.0**
Upstream *(million metric tonnes of CO_2e)*	7.9	8.2	8.2	8.5	**8.3**
Operated oil sands *(million metric tonnes of CO_2e)*	7.8	8.2	8.2	8.4	**8.2**

ENVIRONMENT *(continued)*	2016	2017	2018	2019	**2020**
Production/throughput					
Downstream & Chemical – refining throughput *(million m³)* (4)	21	22	23	20	**20**
Upstream – production *(million m³)* (5)	21	21	22	21	**22**
Operated oil sands – production *(million m³)* (6)	20	21	21	21	**22**
GHG emissions intensity (7)					
Downstream & Chemical *(metric tonnes of CO_2e/m^3 refining throughput)* (4)	0.25	0.23	0.22	0.24	**0.25**
Upstream *(metric tonnes of CO_2e/m^3 upstream production)* (5)	0.38	0.39	0.38	0.40	**0.38**
Operated oil sands *(metric tonnes of CO_2e/m^3 upstream production)* (6)	0.39	0.39	0.38	0.40	**0.38**
Total energy use *(million gigajoules)*	220	223	227	227	**225**
Fuels refining Solomon EII® – normalized versus 1990 (8)	0.808	0.804	0.790	0.809	**0.822**

(1) Some uncertainty exists in performance data, depending on measurement methods. Data in the report and performance data table represent the best available information at the time of publication. Data represents Imperial owned and operated assets (including 100% Kearl, Cold Lake and Norman Wells; excluding ExxonMobil Canada, XTO Canada and Syncrude). Retail stations (sold in 2016) and other assets that were divested between 2016-2020 are not included.

(2) Greenhouse Gas (GHG) emissions were quantified based on applicable provincial and federal regulations. Imported/exported electricity GHG emission factor (0.37 tonnes CO_2e/MWhr) consistent with the benchmark established for electricity from 2019 CCIR (Carbon Competitiveness Incentive Regulation) and OBPS (Output Based Pricing System).

(3) GHG emissions calculated as sum of direct emissions and emissions associated with imported electricity less (minus) emissions associated with exported electricity.

(4) Throughput basis: Refinery throughput is the volume of crude oil and feedstocks that is processed in the refinery atmospheric distillation units.

(5) Production basis: Represents bitumen/crude production at Kearl, Cold lake and Norman wells; Kearl and Cold lake production basis same as reported under Alberta greenhouse gas emissions regulation.

(6) Production basis: Operated oil sands (Kearl and Cold lake) production basis same as reported under Alberta greenhouse gas emissions regulation.

(7) GHG emissions intensity is the ratio of GHG emissions to production or throughput.

(8) Solomon EII® is a measure of energy efficiency for petroleum refineries. A lower energy intensity index number indicates a more energy-efficient facility.

Scope 3 emissions

Scope 3 emissions are GHGs that are generated across the value chain that are not included in Scope 1 and 2. Scope 3 estimates can include employee travel and commuting, transportation and distribution, purchased goods and services, and the use of sold products. We have opted to focus our Scope 3 emissions estimate on the indirect emissions resulting from the consumption and use of the company s products as they represent the majority of our estimate.[49] Scope 3 emissions are a function of the demand for energy products and consumer choices on how and when to use energy products. Consumer actions, including efficient use, are necessary to drive meaningful Scope 3 reductions. As they are indirect and occur outside of our control, the reporting of Scope 3 emissions is less certain and consistent. Imperial is providing solutions to help customers reduce their emissions, which includes advanced fuels and renewable fuels in our product offerings.

Evaluating a company s Scope 3 emissions and comparing them to others can be challenging due to inconsistent reporting methodologies, as well as potential duplication, inconsistencies and inaccuracies that may occur when reporting emissions that are the result of activities from assets not owned or controlled by the reporting organization. The International Petroleum Industry Environmental Conservation Association (IPIECA) acknowledges these issues.[50]

Scope 3 emissions

Indirect

Indirect GHG emissions not included in Scope 2 that occur in the value chain, such as the consumption and use of a company's products (e.g. gasoline in a car)

The table below provides Imperial's Scope 3 estimates associated with the use of its crude oil and natural gas production, in alignment with IPIECA's methodology for the use of sold products. This methodology contemplates accounting for products at the point of extraction (point A), processing (point B) or sales (point C). Imperial's Scope 3 estimates for points A, B and C represent three distinct approaches for accounting, and are not meant to be aggregated as this would lead to duplicative accounting.

For example and for completeness, the table provides the Scope 3 estimates associated with the combustion of the crude processed and products produced and sold from Imperial's refineries (points B and C). However, to avoid duplicative accounting, these Scope 3 estimates are not included in Imperial's Scope 3 total because the associated emissions would also be accounted for by the producer of those crudes.

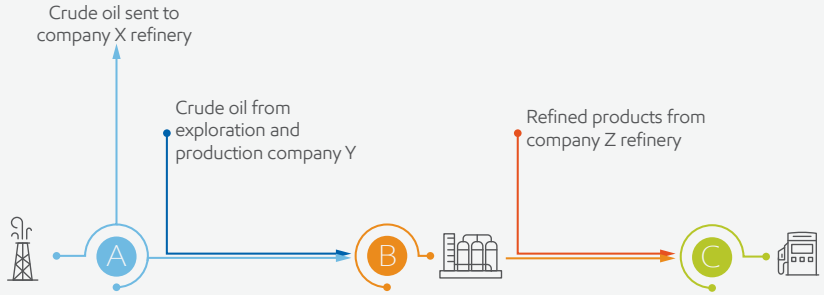
Imperial 2020 Scope 3 estimates

	Upstream production *(point A)*	Refining throughput *(point B)*	Petroleum product sales *(point C)*
Scope 3 potential estimates from the use of sold products *(million tonnes CO_2-equivalent)*	70	50	50

Estimated Scope 3 emissions for the use of Imperial's crude and natural gas production for the year ending Dec 31, 2020 were 70 million tonnes..

Applied CO_2 Emission Factors were obtained from US EPA or derived from API calculations; where applicable, emission factors for specific fuel products were applied. Non-fuels products are not combusted by the end-user and therefore are not included in these Scope 3 estimates. IPIECA's Scope 3 methodology includes 15 categories of activities along each product's value chain. Imperial's scope 3 estimates only includes estimated emissions from Category 11 (Use of Sold Products) as they represent the majority of our Scope 3 emissions. Estimates based on net upstream production, refining throughput and petroleum product sales as reported in Imperial's 2020 10-K annual financial report.

Integrated oil and gas company



Adapted from IPIECA

Governance

Corporate governance

Imperial has an unwavering commitment to high ethical standards, legal compliance and integrity, starting with our board of directors and corporate governance policies. The Nominations and Corporate Governance Committee monitors and recommends implementation of appropriate corporate governance standards and is responsible for identifying and recommending highly qualified directors.

Five of Imperial's seven board members are independent and meet the criteria for independence set by Canadian securities regulators, the U.S. Securities and Exchange Commission (SEC) and the NYSE American LLC. These directors provide thoughtful perspectives and strategic direction in support of the company s interests. All board committees are chaired by independent directors who meet regularly in executive sessions without the presence of management. In 2020, eight independent sessions were held to allow independent board members to raise substantive issues that were more appropriate to be discussed in the absence of management, including assessing potential follow-up required with the chair, discussing what information may be needed from management to perform their duties and seeking feedback about the board processes. Learn more at imperialoil.ca/en ca/company/investors.

Board committees

Community collaboration and engagement

Supports public awareness and consultation, government and Indigenous relations, community partnerships and investment programs.

Audit

Provides oversight of disclosures, financial statements, internal accounting and financial controls, business controls, compliance with legal and regulatory requirements and performance of the audit function (including independence).

Public policy and corporate responsibility

Assists the board by providing oversight on environmental, health, safety and sustainability performance along with legislative compliance and the assessment of potential long-term effects of public policy, climate change and sustainable business practices on corporate performance. Recommends desirable policies and actions.

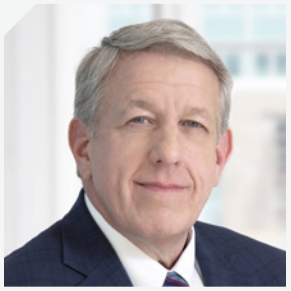
Executive resources

Ensures the compensation system is inherently designed to support the sustainability of the company's operations and the management of risk including risk related to climate change. Reviews and evaluates goals and objectives relative to compensation.

Nominations and corporate governance

Monitors and recommends implementation of appropriate corporate governance standards. Responsible for identifying and recommending highly qualified directors including appointments to committees.

Imperial board of directors



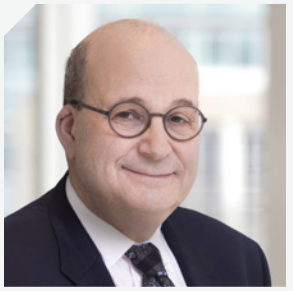
Brad Corson – *Chairman*

David Cornhill

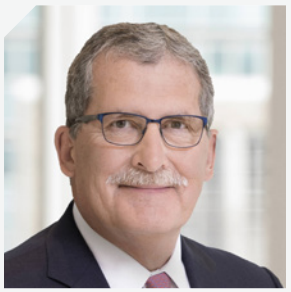
Matthew Crocker

Krystyna Hoeg

Miranda Hubbs



Jack Mintz



David Sutherland

Climate risk oversight

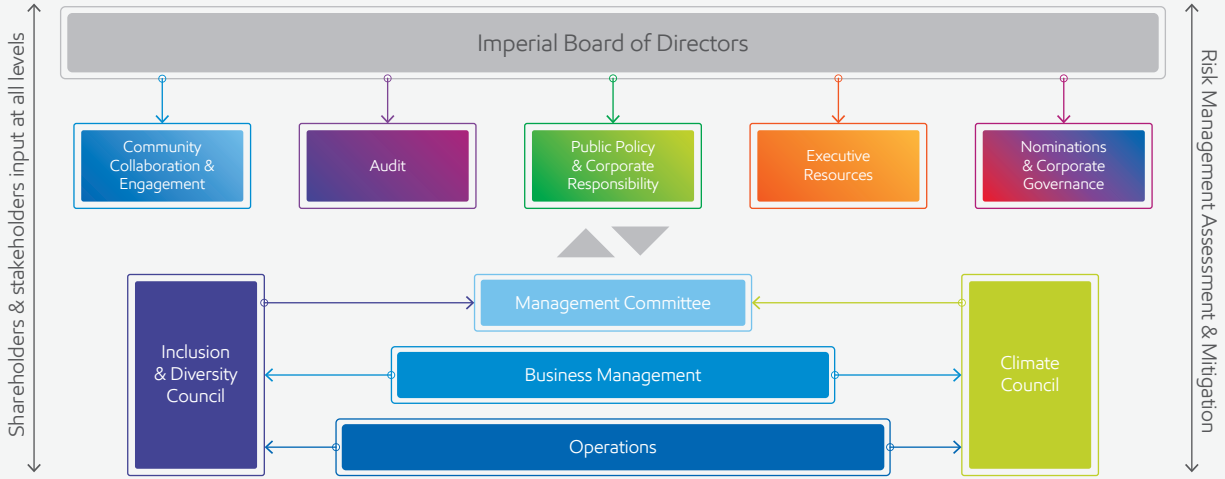
Imperial's board of directors has a fiduciary duty to manage the corporation in its best interests. Our directors act honestly and in good faith in their duty of care. The board provides oversight of enterprise risk, which includes climate risk. The Task Force on Climate-related Financial Disclosures (TCFD) highlights the importance of physical and transition risk and advancing opportunities arising from the energy transition. These risks and opportunities are considered when reviewing management recommendations, corporate plans and strategies and technology reviews, and also inform the company's response to shareholders.

The board contributes to the annual development and approval of strategic plans that consider Canadian and global economic outlooks and management's recommendations regarding major corporate decisions and actions that may have significant societal impact.

The board has access to relevant information to make informed decisions in representation of shareholders. The board evaluates and provides strategic direction on items including but not limited to: strategy, competitive positioning, safety, culture, performance, succession planning, compliance, executive compensation, environmental stewardship, research and technology, public policy, community and Indigenous engagement, stakeholder feedback and disclosure.

The board assesses company performance through a broad range of criteria including site visits, reviews of key reports and the approval of regulatory filings such as oil and gas disclosures under National Instrument 51-101 and interim and annual disclosures under U.S. Securities and Exchange Commission forms. The Public Policy and Corporate Responsibility Committee (PP&CR Committee) assists the board by providing oversight on environmental, health, safety, security and sustainability risk management and performance. This includes compliance with legislation and the assessment of public policy impacts on corporate performance, as well as the risks and disclosure associated with climate change.

Risk management oversight



In 2021, Imperial established a climate council within the organization, with downstream and chemical and upstream multi-disciplinary teams focused on developing and deploying emission reduction pathways. This integrated cross functional approach is key to progressing opportunities across the company in support of our short-, medium- and long-term goals.

Executive compensation

The company's executive compensation program is designed to:

- Align the interests of its executives with long-term shareholder interests;
- Encourage executives to manage risk and take a long-term view when making investments and managing the company's assets;
- Reinforce the company's philosophy that executives' experience, skill and motivation significantly affects future business success; and
- Promote career orientation and strong individual performance.

The compensation program is aligned with the core elements of the majority shareholder's compensation program, including linkage to short and mid-term aspects of incentive pay, long vesting periods, risk of forfeiture and alignment with the shareholder experience. In addition, our long-term incentive program has long-term vesting periods to expose executives to the full impact of the commodity cycle taking into consideration the cyclical nature and long-term orientation for the business.

Executive compensation is linked to overall company performance and is designed to incent effective management of all operating and financial risks associated with Imperial's business, including risks related to climate change. The Executive Resources Committee reviews and evaluates business performance and basis for compensation, which may include:

- Safety, health and environmental performance;
- Risk management;
- Total shareholder return;
- Net income;
- Return on average capital employed; [51]
- Cash flow from operations and asset sales; [51]
- Operating performance of the upstream, downstream and chemical segments; and
- Progress on advancing government relations and long-term strategic interests.

The annual report on compensation is reviewed and approved for inclusion in the corporation's management proxy circular in accordance with applicable legal requirements.

Risk management

Enterprise risk management

Imperial uses a comprehensive risk management framework to identify and manage risk to the company. Risk management occurs at multiple levels of the business as part of Imperial's risk management process. The Management Committee, which includes the chairman, president and chief executive officer, ensures risks, including climate risks, are addressed throughout the company. The company provides regular updates to the board of directors on business risks including climate risks and GHG emissions performance.

Imperial engages directly with a variety of external stakeholders including policy makers, investors, customers, regulators, academics, Indigenous peoples, non governmental organizations and industry associations on issues and opportunities of relevance to the company. This engagement provides excellent external input and feedback to our risk management system.

The management of risk is integrated across the organization through our Operations Integrity Management System (OIMS) that outlines expectations in managing personnel and process safety, operational and environmental risks. It is also integrated in our Controls Integrity Management System (CIMS), which is used to manage business control risks.

Identifying and managing climate-related risk and opportunity

Imperial has a robust issues and opportunities management process to identify and prioritize key actions for the company, including managing the risk of climate change. The issues and opportunities process includes analysis that considers stakeholder input, issues research, trends assessment and potential business impact. It ensures these items get the appropriate level of management attention so strategies can be developed to mitigate risk or progress opportunities. Oversight responsibilities by the Management Committee and the Board and its committees, as described on page 39, are a key part of risk governance.

The Task Force on Climate-related Financial Disclosures outlines climate-related risks and opportunities into three major categories, physical risk, transition risk and climate-related opportunities: [52]

Climate risk and mitigation*

Physical risk

- Physical impacts as a result of climate change
- Includes both acute, event driven risks and chronic risk associated with longer-terms shifts in climate patterns

- Resiliency impacts on facilities and operations
- Design, construction, and operation considers extreme weather events, ie floods, extreme cold, forest fires

Transition risk/ Climate-related opportunities

- Business impacts and opportunities related to the transition to a lower-carbon economy

- Goal to net-zero scope 1 and 2 emissions
- Mitigating emissions in our operations
- Helping customers reduce their emissions
- Climate strategy
- Growth in lower-emissions fuels

Financial impact

- Company disclosure of climate-related risk and opportunities

- Annual Report on Form 10-K, including financial statements and management's discussion and analysis, identifies risk factors, reserve disclosures and business environment and risks
- NI 51-101 (ASC) reserves disclosure
- Advancing Climate Solutions report guided by TCFD framework

* outlines a sample of some risk and opportunities

All about OIMS

Protect Tomorrow. Today.

Imperial's Operations Integrity Management System (OIMS) includes 11 elements, each with an underlying principle and set of expectations. OIMS establishes common expectations for addressing risks inherent in our business and is used to address all aspects of the business that can impact personnel and process safety, security, health and environmental performance. To drive continuous improvement, OIMS is updated periodically.

Risks include, but are not limited to: supply and demand interruptions, extreme weather, government and political factors, and risks associated with exploration and development, operations, and cybersecurity. Imperial conducts risk assessments to identify and address potential hazards using accurate information on processes, facilities, products and regulatory requirements. Assessed risks are prioritized and managed as appropriate for the nature and magnitude of the risk. Decisions are clearly documented and followed up.

Managers and supervisors are expected to credibly demonstrate leadership and commitment for operations integrity. Imperial also uses sound standards, procedures and management systems for facility design, construction, startup, operation and other activities. Facilities meet or exceed applicable regulatory requirements. Quality assurance processes are in place and verifications confirm that risk management recommendations have been addressed.

Facilities are operated within established parameters and according to regulations. Unplanned events are promptly investigated and learnings shared to prevent re-occurrence. Environmental performance, including emissions, discharges and wastes are tracked and stewarded to meet performance goals, and the company carefully selects, trains and monitors personnel. Ongoing evaluations are performed to ensure framework expectations are met.

Facility resiliency

Imperial has extensive experience operating in a range of challenging environments across Canada. The company carefully considers the potential for physical and environmental risks in the design, construction, and operation of facilities. Internal design practices follow industry standards and meet regulatory requirements while incorporating environmental data on extreme events such as forest fires or floods to improve facility design. Procedures are in place to ensure the safety of both personnel and equipment while operating under extreme conditions.

To reduce the potential risk from fire events, facilities are designed to maintain buffer zones appropriate for the forest fire risk associated with the location. The size of the buffer is determined by considering the surrounding vegetation, facility type and construction material.

In the event of a flood, our facilities have infrastructure in place including pumps, ponds, ditches and storm sewers to help manage water.

Temperature extremes — especially cold — can be challenging to all Canadian operations. Winterization of equipment, buildings, instrumentation and piping is considered in facility design to ensure continued operability and maintainability during cold weather conditions.

Emergency preparedness, response and business continuity plans are carefully thought out and maintained. These plans are detailed, practiced and engage external stakeholders and Indigenous communities. In the event of an actual incident, all necessary actions are taken to protect the public, the environment, company personnel and assets. In response to the risk posed by the COVID-19 pandemic, Imperial activated existing emergency and safety protocols at all of our operations and was successful at minimizing impacts to operations during this period.

TCFD mapping

This report is aligned with the core elements of the framework developed by the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD), designed to encourage the informed conversation society needs on these important issues.

TCFD core elements and recommended disclosures		Imperial disclosures
Governance	a. Describe the board's oversight of climate-related risks and opportunities.	pages 39, 41
	b. Describe management s role in assessing and managing climate-related risks and opportunities.	pages 39, 41
Strategy	a. Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term.	pages 4-28
	b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning.	pages 4-28
	c. Describe the resilience of the organization's strategy, taking into consideration different climate related scenarios, including a 2°C or lower scenario.	pages 4-28
Metrics and targets	a. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	pages 29-32
	b. Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions, and the related risks.	pages 29-34
	c. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	page 30
Risk management	a. Describe the organization's processes for identifying and assessing climate related risks.	pages 26, 41-44
	b. Describe the organization's processes for managing climate-related risks.	pages 26, 41-44
	c. Describe how processes for identifying, assessing and managing climate related risks are integrated into the organization's overall risk management.	pages 26, 41-44

Footnotes

(1) *Scope 1 and 2.*

(2) *Compared with 2016 operated oil sands GHGi. Governmental, legal or regulatory changes could directly or indirectly delay or otherwise impact GHG emissions intensity reduction measures.*

(3) *Paris Agreement – Paris Agreement sealed 12-Dec-2015*

(4) *CSP – Cyclic solvent process*

(5) *EBRT – Enhanced bitumen recovery technology*

(6) *NCG – Non-condensable gas*

(7) *ELP – Enhanced late life process*

(8) *Liquid addition to steam for enhanced recovery*

(9) *IEA (2020), Energy Technology Perspectives 2020: Special Report on Carbon Capture Utilisation and Storage. https://www.iea.org/reports/ccus-in-clean-energy-transitions*

(10) *IEA (2021), Net Zero by 2050: A Roadmap for the global energy sector: https://www.iea.org/reports/net-zero-by-2050*

(11) *CCS Readiness – Global CCS Institute https://co2re.co/FacilityData*

(12) *International Energy Agency June 2019, The Future of Hydrogen https://www.iea.org/reports/the-future-of-hydrogen*

(13) *Canada hydrogen strategy https://www.nrcan.gc.ca/climate-change-adapting-impacts-and-reducing-emissions/canadas-green-future/the-hydrogen-strategy/23080*

(14) *Costs for illustrative purposes. Cost influenced by geographic location, cost of electricity and access to inexpensive natural gas.*
Table 38: Comparison of different hydrogen production methods – Hydrogen Production Cost – an overview | ScienceDirect Topics (https://www.sciencedirect.com/topics/engineering/hydrogen-production-cost)
IEA: Global average levelised cost of hydrogen production by energy source and technology, 2019 and 2050 https://www.iea.org/data-and-statistics/charts/global-average-levelised-cost-of-hydrogen-production-by-energy-source-and-technology-2019-and-2050

(15) *https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs*

(16) *IEA, 2021 World Energy Outlook*

(17) *A Call to Action: A Canadian Roadmap for Small Modular Reactors*

(18) *Canada's Small Modular Reactor – SMR Action Plan https://smractionplan.ca*

(19) *Nuclear in Canada https://www.nrcan.gc.ca/sites/nrcan/files/energy/pdf/uranium-nuclear/20-02262-Canada-Nuclear-Fuel-Cycle-Infographic-EN.pdf*

(20) *Alberta Innovates (2021, November). Bitumen Beyond Combustion. AI-BBC-WHITE-PAPER__WEB.pdf https://albertainnovates.ca*

(21) *Global Carbon Fiber Market – Analysis By Raw Material (PAN, Pitch and Rayon), Fiber Type (Virgin, Recycled), End User, By Region, By Country (2021 Edition): Market Insights and Forecast with Impact of COVID-19 (2021–2026) https://www.researchandmarkets.com*

(22) *National asphalt pavement association – APA_RAP_Benefits_for_Pavement_Owners_1121.pdf https://www.asphaltpavement.org*

(23) *National asphalt pavement association: Recycling – National Asphalt Pavement Association https://www.asphaltpavement.org/expertise/sustainability/sustainability-resources/recycling*

(24) *Carbon Footprint: How Does Asphalt Stack Up? By OHMPA CarbonFootprint_OHMPAv1.indd www.onasphalt.org*

(25) *https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

(26) *Estimates regarding GHG emissions, expected volume growth, blending projects, and investments are forward looking statements and subject to risk factors that can be found in our most recent form 10-K.*

(27) *Based on internal and third-party vehicle engine testing, laboratory testing and/or industry or other scientific literature. Basis for comparison for all claims is versus diesel without detergent additive. Vehicle type, engine type, driving behaviour and other factors also impact fuel and vehicle performance, emissions and fuel economy. Synergy Diesel Efficient fuel may be used in other heavy-duty and light-duty vehicles, but results will vary.*

(28) *All claims are based on comparison of Synergy Supreme premium gas to gasoline meeting minimum Canadian government detergency standards in port fuel injected engines. Actual benefits are based on continuous use and may vary depending on vehicle type, driving style, and gasoline previously used. Concentration and availability of our proprietary additive package may vary based upon factors beyond our control, including supply disruptions.*

(29) *ExxonMobil Advancing Climate Solutions 2022 progress report https://corporate.exxonmobil.com/Climate-solutions/Advancing-climate-solutions-progress-report*

(30) *BMO February 2019 ESG ratings by major oil producing country. Canada ranks third (second in oil producing nations) on aggregate of Yale Environmental Performance Index (EPI), Social Progress Imperative's Social Progress Index, and World Bank's Worldwide Governance Indicators Benchmark.*

(31) *IEA says Canada can be key global oil supplier if emissions promises kept | Reuters https://www.reuters.com/business/energy/iea-urges-canada-use-clean-power-resources-help-cut-emissions-2022-01-13*

(32) *ExxonMobil's 2021 Outlook for Energy https://corporate.exxonmobil.com/Energy-and-innovation/ Outlook-for-Energy*

(33) *PCC, 2018: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above preindustrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma Okia, C. Péan, R. Pidcock, S. Connors, J. B.R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. In Press*

(34) *Land use and natural sinks are excluded.*

(35) *The IPCC Lower 2°C scenarios produce a variety of views on the global energy demand in total and by specific types of energy, providing a range of possible growth rates for each type of energy across these 74 scenarios. Given the inherent uncertainty in energy demand modeling, ExxonMobil used an average of all 74 scenarios to approximate growth rates for various energy types as a means to estimate trends to 2040 indicative of hypothetical 2°C pathways.*

(36) *Reserve estimates provided in these materials are effective as of December 31, 2020, and based on definitions contained in the Canadian Oil and Gas Evaluation Handbook (COGEH) and are presented in accordance with National Instrument 51-101, as disclosed in Imperial's Form 51-101F1 for the fiscal year ending December 31, 2020. Except as otherwise disclosed herein, reserves information are an estimate of the company's working interest before royalties at year-end 2020, as determined by Imperial's internal qualified reserves evaluator. Working interest is Imperial's share before deducting the shares of mineral owners or governments or both. In these materials, certain natural gas volumes have been converted to barrels of oil equivalent (BOE) on the basis of six thousand cubic feet (Mcf) to one barrel (bbl). BOE may be misleading, particularly if used in isolation. A BOE conversion ratio of 6 Mcf to one bbl is based on an energy-equivalency conversion method primarily applicable at the burner tip and does not 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 than the energy equivalency ratio of 6 Mcf to 1 bbl, using a 6:1 conversion ratio may be misleading as an indication of value. Please note, proved reserves reported on the U.S. Securities and Exchange Commission use a different methodology, and U.S. investors are urged to consider closely the disclosures in the company's Form 10-K.*

(37) *IEA (2021). Net Zero by 2050: A roadmap for the global energy system. fig 3.4 p 103.*

(38) *Property and/or operations that Imperial and its affiliates owns or control.*

(39) *Canada's Climate Actions for a Healthy Environment and a Healthy Economy PDF https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/actions-healthy-environment-economy.html*

(40) *Canada confirms its support for the Global Methane Pledge and announces ambitious domestic actions to slash methane emissions. https://www.canada.ca/en/environment-climate-change/news/2021/10/canada-confirms-its-support-for-the-global-methane-pledge-and-announces-ambitious-domestic-actions-to-slash-methane-emissions.html*

(41) *Environment and Climate Change Canada: Clean Fuel Regulations: Target and Trajectory, March 2022.*

(42) *Government of Canada: Zero-emission vehicles https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles*

(43) *Production basis: Operated oil sands (Kearl and Cold Lake) production basis same as reported under Alberta greenhouse gas emissions regulation.*

(44) *GHG emissions intensity is the ratio of GHG emissions to production or throughput.*

(45) *In 2019, our Cold Lake production volumes were unable to fully offset natural field decline and our Kearl mine site needed to move more overburden than the previous year. Although this resulted in a slight uptick in our GHGi metric for 2019, we remain on track and focused on our 2030 goal.*

(46) *IHS Markit Ltd.*

(47) *IHS Markit Ltd., ARC Financial Corp, Jacobs Consultancy Inc, National Energy Technology Laboratory, Canadian Natural Resources Limited, MEG Energy*

(48) *Sleep et al., 2021 Journal of Clean Fuel Production (vol. 281).*

(49) *IPIECA, API estimating petroleum industry value chain (Scope 3) greenhouse gas emissions (api.org). From 3.11.2, Materiality Consideration, 'The use of sold products is typically the most significant contributor to emissions for fuel-producing companies and can account for more than 80% of total scope 3 emissions.'*

(50) *IPIECA/API, 2016. Estimating petroleum industry value chain (scope 3) greenhouse gas emissions – Overview of methodologies.*

(51) *For a definition of return on average capital employed and cash flow from operations and asset sales, see the "Frequently used terms" section of Imperial's most recent annual report on Form 10-K.*

(52) *Task Force on Climate-related Financial Disclosure https://www.fsb-tcfd.org/*

Cautionary statement

Statements of future events or conditions in this report, including projections, goals, expectations, estimates, business plans and descriptions of strategic and emission reduction goals are forward-looking statements. Similarly, emission-reduction pathways are dependent on future market factors, such as continued technological progress and policy support, and also represent forward-looking statements. Forward-looking statements can be identified by words such as believe, anticipate, propose, plan, goal, predict, estimate, expect, strategy, outlook, future, continue, likely, may, should, will and similar references to future periods. Forward-looking statements in this report include, but are not limited to, references to Imperial's Scope 1 and 2 net-zero goal by 2050 for its operated oil sands assets, and greenhouse gas emissions intensity goals for 2023 and 2030 for its oil sands operations; the ability to provide energy transition solutions for the company and its customers; the impact of participation in the Oil Sands Pathways to Net Zero alliance and other collaboration efforts; the company's climate strategy over the short, medium and long term, including the timing, development, and impact of specific technologies and R&D activities for in-situ, CCS, hydrogen, small modular reactors, BBC, asphalt, lower carbon fuels and using offsets to reduce residual emissions; plans to construct a renewable diesel facility at Strathcona, including reduction of CO_2 emissions; potential technology deployment pathways; the Outlook for Energy including energy supply and demand; the company's ability to monitor potential shifts in the energy landscape, improve asset performance and sustain a strong competitive position; the ability to increase cash flow while delivery environmental performance enhancements and economic returns; the scale and impact of digital technology innovation; the effectiveness of the board's governance, oversight and risk management activities; and facility resiliency, preparedness and response systems.

Forward-looking statements are based on the company's current expectations, estimates, projections and assumptions at the time the statements are made. Actual future financial and operating results, including expectations and assumptions concerning demand growth and energy source, supply and mix; commodity prices; production rates, growth and mix across various assets; project plans, timing, costs, technical evaluations and capacities, and the company's ability to effectively execute on these plans and operate its assets; production life, resource recoveries and reservoir performance; plans to mitigate climate risk and the resilience of company strategy to a range of pathways for society's energy transition; the adoption and impact of new facilities or technologies on capital efficiency, production and reductions to GHG emissions intensity; the amount and timing of emissions reductions; that any required support from policymakers and other stakeholders for various new technologies such as carbon capture and storage will be provided; applicable laws and government policies, including with respect to climate change and GHG emissions reductions; receipt of regulatory approvals; financing sources and capital structure; capital and environmental expenditures; could differ materially depending on a number of factors. These factors include political or regulatory events, including changes in law or government policy; environmental risks inherent in oil and gas activities; environmental regulation, including climate change and greenhouse gas regulation and changes to such regulation; failure or delay of supportive policy and market development for emerging lower-emission energy technologies; the receipt, in a timely manner, of regulatory and third-party approvals; the results of research programs and new technologies, including with respect to greenhouse gas emissions, and the ability to bring new technologies to scale on a commercially competitive basis; availability and allocation of capital; availability and performance of third-party service providers, including in light of restrictions related to COVID-19; unanticipated technical or operational difficulties; global, regional or local changes in supply and demand for oil, natural gas, and petroleum and petrochemical products and resulting price, differential and margin impacts; management effectiveness and disaster response preparedness, including business continuity plans in response to COVID-19; project management and schedules and timely completion of projects; unexpected technological developments; third-party opposition to company and service provider operations, projects and infrastructure; the pace of regional and global recovery from the COVID-19 pandemic and actions taken by governments and consumers resulting from the pandemic; reservoir analysis and performance; the ability to develop or acquire additional reserves; operational hazards and risks; cybersecurity incidents; general economic conditions; and other factors discussed in Item 1A risk factors and Item 7 management's discussion and analysis of the company's most recent annual report on Form 10-K and subsequent interim reports on Form 10-Q.

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 Imperial. Imperial's actual results may differ materially from those expressed or implied by its forward-looking statements and readers are cautioned not to place undue reliance on them. Imperial undertakes no obligation to update any forward-looking statements contained herein, except as required by applicable law.

References to "oil" and "gas" include crude, natural gas liquids, bitumen, synthetic oil, and natural gas. The term "project" as used in this report can refer to a variety of different activities and does not necessarily have the same meaning as in any government payment transparency reports.

The statements and analysis in this document represent a good faith effort by the company to address hypotheticals despite significant unknown variables and, at times, inconsistent market and government policy signals. It is not intended to communicate any material investment information. Energy demand modeling aims to replicate system dynamics of the global energy system, requiring simplifications. The reference to any scenario, including any potential net-zero scenario, does not imply Imperial views any particular scenario as likely to occur. In addition, energy demand scenarios require assumptions on a variety of parameters. As such, the outcome of any given scenario using an energy demand model comes with a high degree of uncertainty. For example, the IEA describes its NZE scenario as extremely challenging, requiring unprecedented innovation, unprecedented international cooperation and sustained support and participation from consumers. Third-party scenarios discussed in this report reflect the modeling assumptions and outputs of their respective authors, not Imperial, and their use or inclusion herein is not an endorsement by Imperial of their underlying assumptions, likelihood or probability. Investment decisions are made on the basis of Imperial's separate planning process, but may be secondarily tested for robustness or resiliency against different assumptions, including against various scenarios. Any use of the modeling of a third-party organization within this document does not constitute or imply an endorsement by Imperial of any or all of the positions or activities of such organization.

Imperial reported emissions, including reductions and avoidance performance data, are based on a combination of measured and estimated data using best available information. Calculations are based on industry standards and best practices, including guidance from the American Petroleum Institute (API) and IPIECA. The uncertainty associated with the emissions, reductions and avoidance performance data depends on variation in the processes and operations, the availability of sufficient data, the quality of those data and methodology used for measurement and estimation. Changes to the performance data may be reported as updated data and/or emission methodologies become available. ExxonMobil works with industry, including API and IPIECA, to improve emission factors and methodologies, including measurements and estimates and shares these best practices with Imperial for consideration.

Actions needed to advance the company's 2030 greenhouse gas emissions intensity reductions plans are incorporated into its medium-term business plans, which are updated annually. The reference case for planning beyond 2030 is based on the ExxonMobil's Energy Outlook research and publication, which contains demand and supply projections based on assessment of current trends in technology, government policies, consumer preferences, geopolitics, and economic development. Reflective of the existing global policy environment, the Energy Outlook does not project the degree of required future policy and technology advancement and deployment for the world, or Imperial, to meet net-zero goals by 2050. As future policies and technology advancements emerge, they will be incorporated into the Outlook, and the company's business plans will be updated accordingly.

This presentation includes a number of third-party scenarios such as the IPCC 74 Lower 2°C scenarios, made available through the IPCC SR 1.5 scenario explorer data, and the IEA's Net Zero Emissions by 2050 Scenario. These third-party scenarios reflect the modeling assumptions and outputs of their respective authors, not Imperial or ExxonMobil, and their use and inclusion herein is not an endorsement by Imperial or ExxonMobil of their likelihood or probability. The analysis done by ExxonMobil on the IPCC Lower 2°C scenarios and the IEA NZE 2050 scenario and the representation thereof aims to reflect the average or trends across a wide range of pathways. Where data was not or insufficiently available, further analysis was done to enable a more granular view on trends within these scenarios.

After more than a century, Imperial continues to be an industry leader in applying technology and innovation to responsibly develop Canada's energy resources. As Canada's largest petroleum refiner, a major producer of crude oil, a key petrochemical producer and a leading fuels marketer from coast to coast, our company remains committed to high standards across all areas of our business.

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