

From: Beth Burke
To: XX
Subject: thank you!

Thank you so much for meeting with us last week. Attached is a note from James, as well as the facts sheet he handed you, and an electronic copy of the book he showed you on Alberta's climate approach. We look forward to staying in touch. Please let us know if we can ever be helpful.

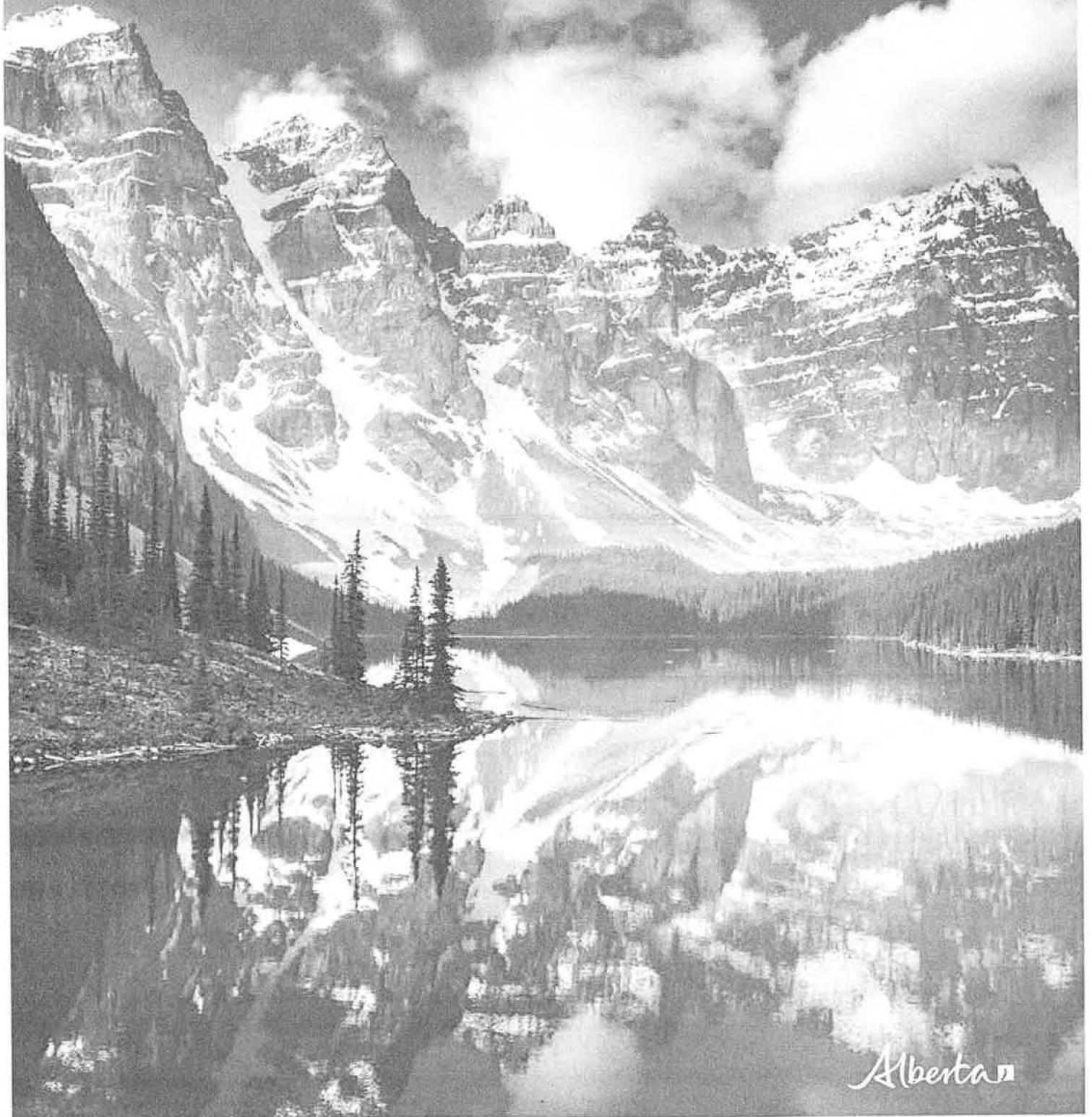
Have a lovely week.

Many thanks,
Beth

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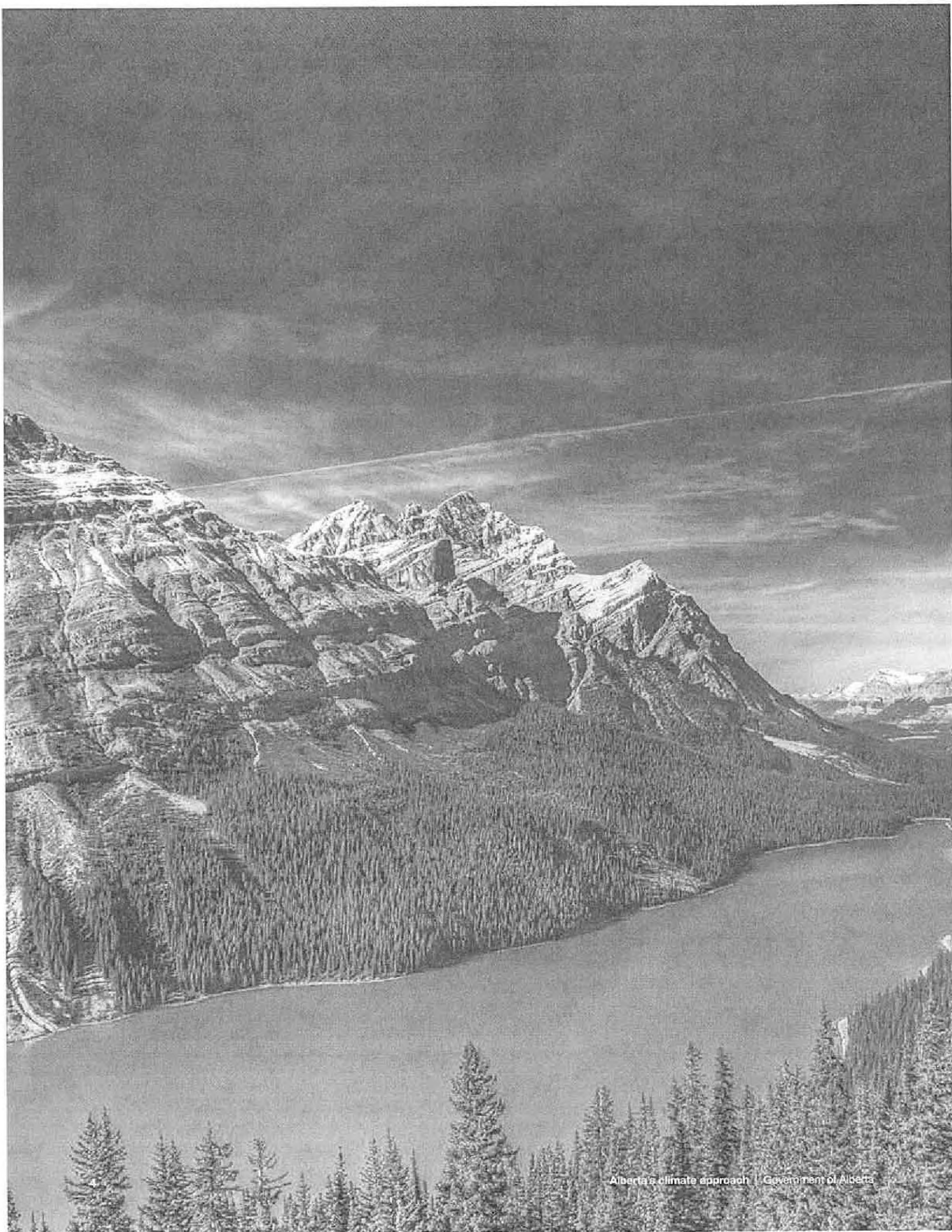
Alberta's climate approach



Alberta 

Contents

North America’s responsible energy future is in Alberta	5
Alberta is part of the global climate solution	6
Alberta will combine existing climate solutions with new opportunities	7
Alberta’s carbon pricing system	10
Technology innovation and emissions reduction fund.....	11
Methane	12
Oil sands	12
Site rehabilitation program.....	14
Indigenous participation in Alberta’s natural resource and energy development.....	14
Carbon capture, utilization and storage (CCUS) and negative emissions technologies	16
Hydrogen.....	17
Electricity generation and use.....	18
Minerals.....	19
Environmental stewardship.....	20
Land.....	20
Air.....	21
Water.....	21
In summary.....	22



Alberta's climate approach | Government of Alberta

North America's responsible energy future is in Alberta

Alberta shares America's commitment to addressing climate change and emissions management. As a new era of environmental commitment dawns, Alberta is ready to help meet North America's growing need for ethical and environmentally responsible energy.

Alberta's environmental legacy is strong, from introducing the first North American price on industrial emissions, to an internationally recognized methane emissions reduction framework, and setting an example for the world by investing in innovative technologies like carbon capture, utilization and storage.

This legacy is made possible by the entrepreneurial spirit of Albertans. Not only do our businesses adapt to change, but they consistently show leadership by thinking, acting and investing for the future. Our energy industry has always looked forward, through changing times and evolving demands, by developing new and better technologies, innovating at all stages of the upstream and downstream processes, and sharing the benefits of resource development to build strong and resilient communities.

Developing our resources to meet environmental and social responsibilities is in Alberta's nature. This approach promises opportunities for our citizens and our American neighbours, whether they are construction workers looking for hope in an economy hit hard by the pandemic,

Indigenous communities seeking to fulfil the promise of their resource legacies, researchers striving for a cleaner, more equitable world, or industry leaders counting on a reliable energy supply to fuel the evolution of energy itself.

Demand for stable energy will continue to increase, according to the International Energy Agency, with a projected United States shortfall of 50-million barrels per day by the end of the decade. Alberta is in an excellent position to help meet this need, with energy developed under some of the most stringent environmental and climate standards in the world.

The advantage of a secure supply of energy right next door is enhanced by Canada's political stability and democratic accountability, exceptional education and labour standards, and globally recognized dedication to human rights.

Environmentally responsible energy is crucial to a better future, and the future is in Alberta.

Alberta is part of the global climate solution

Alberta has the innovation, technology and expertise that Canada and the world need to reach climate ambitions, such as net zero by 2050 and interim emission reduction targets.

Alberta takes climate change and emissions management seriously. In 2007, Alberta was the first jurisdiction in North America to put a price on industrial greenhouse gas emissions, forcing large emitters to meet emission reduction targets. Emitters that do not meet set targets can buy emission offsets, or pay into a fund to support innovative technologies that reduce emissions while keeping Alberta's industries competitive. As of January 2020, Alberta's industrial carbon pricing framework has resulted in 175 million tonnes (193 million US tons) of compliance action through use of emission performance credits, investing in Alberta-based carbon offsets and fund payments.

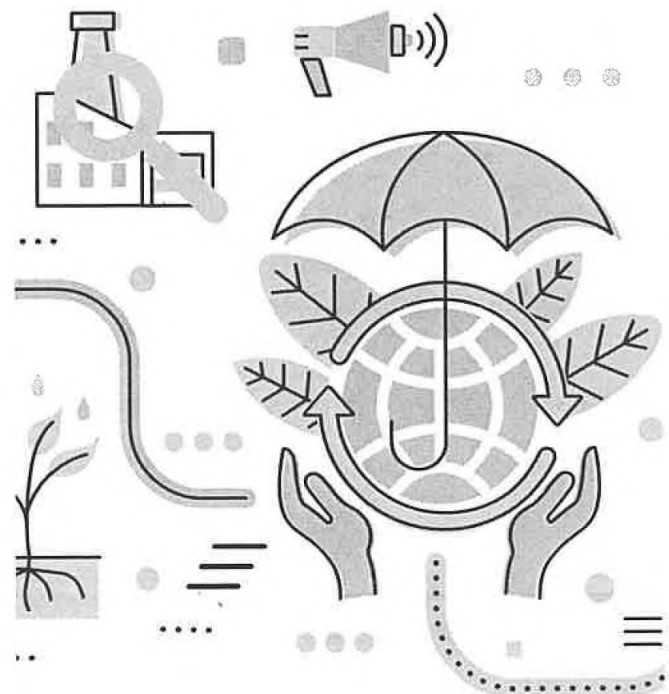
Beyond carbon pricing, Alberta is leading the world with our progress on carbon capture, utilization and storage and our precedence in methane reduction initiatives, while our Technology Innovation and Emissions Reduction (TIER) funded programs are encouraging development of game-changing technology.

Stewardship of Alberta's air, water, land and biodiversity is shared with local and Indigenous communities, other governments and strategic partners. Our approach considers project-specific impacts as well as those that may accumulate over time, and requires performance reporting.

Alberta has some of the highest environmental, human rights, education, and labour standards in the world. Our industries consistently attract talent and investors who believe in environmental and social responsibility. Alberta invests in post-secondary education to support successful innovation, encourage a successful workforce, and improve social environmental and economic well-being.

To maintain our position as a global leader in responsible development, Alberta's climate policy goes beyond the emissions intensity of a type of crude oil. It also enhances environmental, social and governance indicators, including data transparency, environmental protection, relationships with Indigenous Peoples, and stable governance and regulatory excellence.

Alberta is facing these matters with ingenuity and pragmatism. We are prepared for the work and opportunities ahead.



Highlights

In 2007, Alberta was the first jurisdiction in North America to put a price on industrial greenhouse gas emissions.

As of January 2020, Alberta's industrial carbon pricing framework has resulted in 175 million tonnes (193 million US tons) of compliance action through use of emission performance credits, investing in Alberta-based carbon offsets and fund payments.

Alberta will combine existing climate solutions with new opportunities



Alberta's carbon pricing system

The Technology Innovation and Emissions Reduction (TIER) program is the third generation of Alberta's leading industrial carbon pricing and emissions trading system. TIER is at the core of emissions management in Alberta.



Technology innovation and emissions reduction fund

To meet compliance under TIER, instead of buying carbon offsets regulated industrial facilities have the option of paying into the TIER fund at \$40 per tonne in 2021. The TIER fund supports programs and projects that drive emission reductions through research, development, commercialization, and new technology.



Methane

Alberta was the first sub-national government in North America to set an oil and gas methane reduction target: 45 per cent reduction in upstream oil and gas methane emissions from 2014 levels by 2025. Alberta's regulatory requirements, investment support and market-based approaches are recognized on the world stage, and we expect to exceed our reduction target.



Oil sands

Alberta is committed to responsible oil and gas development, including the oil sands. This means balancing environmental protection with social and economic benefits. Alberta has a strong regulatory system and proven success in reducing emissions intensity and the environmental impacts of oil sands production. With these successes and key policy tools and initiatives, Alberta will continue its energy leadership as the global economy transitions to a less carbon-intensive future.



Site rehabilitation program

After the recent economic crisis, Alberta is partnering with the federal government to provide up to \$1 billion in grants to oil field service contractors for well, pipeline, and oil and gas site closure and reclamation, creating jobs and benefiting the environment and the economy.



Indigenous participation in Alberta's natural resource and energy development

Indigenous consultation and participation are foundational to developing Alberta's natural resources. Oil sands developments provide billions of dollars to Indigenous-owned companies and communities. Initiatives like the Oil Sands Monitoring Program and the Alberta Indigenous Opportunities Corporation are helping Indigenous businesses and communities play a meaningful role in the development, management, and protection of our natural resources.



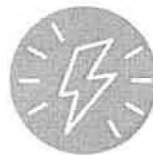
Carbon capture, utilization and storage and negative emissions technologies

Alberta is among the global leaders in carbon capture, utilization and storage (CCUS) technology with two world-class CCUS projects. So far five million tonnes of emissions have been captured and permanently stored underground. Ideal geological conditions and key infrastructure mean Alberta is well positioned to meet industrial emission reduction commitments.



Hydrogen

Alberta is one of the world's largest producers of hydrogen for domestic industrial processes including petrochemical manufacturing. Unique geology and significant investments in natural gas production and carbon sequestration infrastructure mean that Alberta can supply the world with low-emission, affordable hydrogen. A hydrogen economy in Alberta will support economic growth and emissions reductions.



Electricity generation and use

Alberta uses a market-driven approach to generate and efficiently use electricity. The TIER program, industrial carbon price and Emission Offset System have increased investment in market-based renewables in its open power market, making Alberta a destination for renewable electricity investments. Since 2019, private sector companies have newly proposed or started construction on 16 solar and 10 wind power generation projects, adding up to 3,800 megawatt-hours of capacity onto the power grid by 2030. Partnerships like the Municipal Climate Change Action Centre further support the advancement and deployment of energy efficiency innovations and technologies.



Minerals

Alberta has vast, untapped geological potential to meet the increasing demand for minerals, such as lithium, vanadium, uranium, and rare earth elements, many of which are used worldwide to manufacture batteries, cell phones and energy storage cells. This potential, with the province's reputation as a leader in responsible resource development, creates the conditions for Alberta to become a preferred international producer and supplier of minerals and mineral products.



Environmental stewardship

Alberta's environmental management systems include a commitment to monitoring and sustainable development, and membership in related international partnerships.



Land

Alberta is committed to preserving its rich, diverse landscapes and biodiversity for future generations. Conservation work includes responsibly managing parks and public lands, and supporting stewardship initiatives on private lands. Over 15 per cent of the provincial land base is protected and conserved to safeguard the health of more than 60,000 species. Alberta is a world leader in land use planning. Legislation like the *Alberta Land Stewardship Act* sets requirements and ensures decisions are coordinated on land use, species, settlement, natural resources and the environment.



Air

Alberta is ensuring Albertans have clean air. Coal-fired electricity generation will be phased out by 2023. Industrial emissions are regulated. Air quality management frameworks set triggers and limits to the cumulative effects of development. This important work protects human and ecosystem health.



Water

Alberta's Rocky Mountains form the headwaters that supply much of Canada with fresh water. Precious water is managed through the Water for Life Strategy, which includes actions to meet current and future needs of communities, ecosystem health, and the economy. Alberta relies on local governance to lead collaborative planning and stewardship. Eleven Watershed Planning and Advisory Councils cover all major river basins. Water management frameworks set triggers and limits to manage cumulative effects, protect aquatic ecosystems, and ensure efficient water use.



Alberta's carbon pricing system

Alberta has been a partner since the World Bank Carbon Pricing Leadership Coalition was founded in 2015. **We are one of only three sub-national government technical members in the World Bank Partnership for Market Readiness.** These World Bank groups enable Alberta learn and share experience with other jurisdictions to strengthen our carbon pricing policies and other measures to reduce emissions.

The Technology Innovation and Emissions Reduction (TIER) program is Alberta's third generation of industrial carbon pricing and emissions trading system. TIER is at the core of emissions management in Alberta.

Large industrial emitters regulated under TIER must find new, innovative technology solutions to meet facility or sector-specific emission reduction targets that are tightened annually. If regulated emitters do not meet their annual target, they must pay into the TIER fund. These collected payments are then recycled to fund projects and programs that further support research and development to reduce emissions, support industry to gain access to technology solutions, and support climate change adaptation in Alberta.

- **How it Works** - The TIER regulation requires any facility that emits 100,000 tonnes (110,000 US tons) or more of carbon dioxide equivalent (CO₂e) to meet annual emission reduction obligations determined using either a facility-specific or a sector benchmark approach.
- **Compliance** - Regulated facilities have three choices: reduce greenhouse gas emissions on site, buy emission offset credits, or pay into the TIER fund currently set at \$40 per tonne of CO₂e in 2021.
- **Emissions Coverage** - More than 60 per cent of Alberta's GHG emissions are regulated by TIER. Sectors subject to TIER include oil and gas; electricity, forestry, chemicals, fertilizers, minerals, and food processing.
- **Alberta's Success** - As of January 2020, Alberta's industrial carbon pricing framework has reduced emissions by almost 175 million tonnes (193 million US tons) since the framework came into effect in 2007:

Highlight

To complement TIER, Alberta's Emission Offset System is one of the most advanced regulatory emission offset (carbon credit) systems in the world. It provides market incentives for companies throughout the economy to find ways to reduce emissions.

Emission offsets, also known as carbon offsets or carbon credits, are verified emission reductions from designated projects that can be used to compensate emissions generated at other facilities. In Alberta, facilities regulated by TIER can buy emission credits to offset more costly reduction projects at their own facility.

Alberta's climate change policies provide incentives for emission reductions in a variety of sectors, including agriculture, forestry, oil and gas, waste management, carbon capture and storage, and renewable electricity generation.

- Alberta's Emission Offset System is internationally recognized. Jurisdictions in the United States, Australia, China, and South Korea have met with Alberta to learn how to develop and refine their own emission offset programs and protocols.
- Alberta is unique in North America with our large number (19) of emissions-reducing activities for which companies can be recognized as emission offset projects. In comparison, the Regional Greenhouse Gas Initiative (a mandatory market-based program including 11 eastern U.S. states¹) has seven types of activities, while California's Western Climate Initiative has six.
- To date, **Alberta offset projects have reduced emissions by 65.4 million tonnes (72.1 million US tons)**. This is over and above what is required in regulation or business as usual.
- International partners may participate in Alberta's Emission Offset System and generate emission offsets for projects completed in Alberta.

¹ Regional Greenhouse Gas Initiative is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Virginia to cap and reduce CO₂ emissions from the power sector.



Technology innovation and emissions reduction fund

The TIER fund reduces emissions by funding programs and projects that focus on innovation, research and technology to reduce emissions at a lower cost, while supporting jobs.

In addition, the TIER fund supports projects that help municipalities and Indigenous communities better understand, manage and adjust to a changing climate.

Alberta distributes TIER funding through government-led programs and also partners with a number of TIER-funded organizations that are delivering meaningful results, such as Emissions Reduction Alberta (ERA).

Alberta partners with ERA to call for projects that will develop and deploy innovative technology that reduces emissions. Organizations based in the United States are eligible to apply and have seen success in the past.

- ERA's \$150-million shovel-ready call for proposals received 14 proposals from organizations based in the United States, asking for **a total of \$109 million on a collective project value of \$1.16 billion.**
- In previous funding rounds, ERA provided 10 United States-based organizations with a total of **\$4.6 million for Alberta-based projects worth \$18.2 million.**

As part of the response to the pandemic's economic challenges, over the next three years Alberta will spend up to **\$750 million from the TIER fund as part of a provincial economic stimulus package.** This funding will drive significant emissions reductions, support up to **8,700 jobs**, and inject **\$1.9 billion into the economy.** Programs and projects to be funded as part of this stimulus package include:

- The Industrial Energy Efficiency and Carbon Capture, Utilization and Storage Grant Program that provides \$100 million for projects like electricity co-generation, waste heat recovery, and low-carbon fuel feed systems. **By 2030, these projects are expected to reduce emissions by about 3 million tonnes (3.3 million US tons).**
- Alberta is building 10 high-priority flood mitigation projects, investing \$45 million to improve existing infrastructure.

Research Highlights

Since 2009, Emissions Reduction Alberta committed \$616 million to 186 technology and innovation projects worth more than \$4.5 billion. As a result, emissions will be cumulatively reduced by 35 million tonnes (38.5 million US tons) of carbon dioxide by 2030.

In 2018, the Climate Change Innovation and Technology Framework awarded 49 grants worth almost \$43 million. The projects approved within these programs have an estimated cumulative GHG reduction of approximately 5.7 million tonnes (6.3 million US tons) of carbon dioxide by 2030.

- Alberta created the Climate Adaptation Program, providing \$4.5 million to help municipalities and Indigenous communities learn about climate adaptation, assess how vulnerable they are to natural disasters, and build climate adaptation plans.
- ERA launched the Energy Savings for Business Program, providing \$55 million for energy efficiency projects at office buildings and small and medium-size facilities in sectors like food processing and waste management.
- ERA invested \$10 million in the Lacombe Biorefinery, a \$45-million project to turn agricultural waste into organic fertilizer and renewable natural gas. **The facility will cut an estimated 40,000 tonnes (44,100 US tons) of emissions annually.**

In addition to TIER fund investments, Alberta is widely recognized as a hub for research and innovation.

- The University of Alberta ranked eighth globally in environmental science and engineering. Alberta tied with Princeton, and placed ahead of MIT and the University of California, Berkeley (2019 Academic Ranking of World Universities by Subject).
- In 2019, California-based Startup Genome ranked Alberta's largest city, Calgary, in the top 15 clean technology startup ecosystems in the world, along with New York City, Silicon Valley, Austin and Houston.



Methane

Alberta was the first sub-national in North America to set an upstream oil and gas methane reduction target.

- Alberta's combination of regulations, investment support and market-based approaches have been used to highlight best practices for methane reduction internationally. Details of Alberta's system have been published in case studies by organizations such as the United Nations Economic Commission for Europe.
- Alberta made a commitment to reduce methane emissions from upstream oil and gas by 45 per cent from 2014 levels by 2025.
- So far more than **\$300 million has been made available** for methane emission reduction projects in Alberta.
- The World Bank's Global Gas Flaring Reduction Partnership adopted Alberta's flaring and venting standards as a model. From 2014 to 2019, Alberta reduced gas flaring and venting volumes by 30 per cent and 65 per cent, respectively.



Oil sands

Alberta regulates its oil sands sector to balance environmental protection with economic development and social benefits. The sector is a leader on emissions and environmental issues and on improving performance, governance and transparency.

Two methods are used to recover bitumen in Alberta:

Surface mining uses large trucks and power shovels to dig up resources near the surface. A processing facility uses hot water to separate the bitumen from the sand. About two tonnes of oil sands (2.2 US tons) produce one barrel of oil. Only 20 per cent of the oil sands are shallow enough to be recovered through surface mining.

In-situ production recovers deeper underground deposits by injecting steam into the well to heat and release the bitumen so it can be raised to the surface. Some projects use one wellbore where both steam is injected and bitumen is extracted. It's more common to drill parallel horizontal wells, one above the other. Steam injected into the upper well heats

Oil Sands Highlights

Alberta reduced emissions per barrel of oil sands production by 36 per cent since 2000, due in part to technological advancements and/or improvements.

In-Pit Extraction Process, implemented by CNRL, has the potential to reduce emissions per barrel by 40 per cent and cut operational costs.

Cyclic Solvent Process, implemented by Imperial Oil Limited, has the potential to eliminate use of steam for extracting bitumen from oil sands, reducing emissions intensity by up to 90 per cent.

and releases the bitumen so it can flow into the lower well and be pumped to the surface.

- Among oil-producing nations, Canada – led by Alberta – ranks **third in global environmental, social and governance factors**. The World Bank’s Worldwide Governance Indicators ranks Canada near the top globally on Government Effectiveness and Regulatory Quality.
- Alberta’s oil sands producers have made exceptional progress in reducing greenhouse gas emissions intensity. **Innovations have already reduced carbon intensity by 22 per cent over the past decade**. Leading producers are on track for a further 16 to 23 per cent reduction over the coming decade, with more new technology awaiting deployment. The carbon intensity of crude oil from many oil sands projects is now equal to or lower than the average for a barrel of crude globally.
- Alberta has a legislated cap on greenhouse gas emissions from the oil sands. This ensures that total oil sands emissions will not increase beyond the cap.
- Oil sands producers save tremendous amounts of fresh water by recycling 80 to 85 per cent of water in oil sands mining, and 85 to 90 per cent in in-situ operations. **In 2019, the industry used 1.7 barrels of fresh water for every barrel of oil produced, a 22 per cent reduction from 2012**.
- Oil and gas infrastructure, including pumpjacks, pipelines and wells, must be safely decommissioned and sites restored to a state equivalent (but not necessarily identical) to conditions before the infrastructure was built. Projects must meet regulatory and environmental standards to acquire reclamation certification.
 - To date, Syncrude Gateway Hill is the only project issued with a reclamation certificate in the oil sands mining area. The project re-established 104 hectares (257 acres), with many species regenerated. Since Alberta requires progressive reclamation throughout the life of the mine, the total area of permanently reclaimed mineable oil sands currently exceeds 7,500 hectares (18,533 acres).
- Alberta uses funding and policies to support provincial oil and gas companies that are committed to emission reduction targets and net-zero operations by 2050. This includes Cenovus Energy, Canadian Natural Resources Limited (CNRL), MEG Energy, Suncor Energy, Imperial Oil Limited, Repsol and Seven Generations Energy. Alberta is also working with industry and stakeholders to find ways to support other industry members who want to achieve net-zero operations by 2050.

Highlight

The United States will continue to need oil from Alberta. The International Energy Agency predicts that, by 2030, there will be a 50-million-barrel shortfall per day to meet projected demand. Alberta can supply this shortfall in an environmentally and socially responsible manner.

- Canada’s Oil Sands Innovation Alliance is a partnership among oil sands producers who share new discoveries with each other, even though they are competitors. This group, which accounts for over 90 per cent of oil sands production, is focused on improving measurement, accountability and environmental performance.
- From 2012 to 2019, oil sands operators significantly improved their environmental performance, including decreasing their in-situ operating footprint by seven per cent, and **decreasing fresh water use from mining and in-situ operations by 22 per cent and 44 per cent**, respectively.
- A 2019 study by IHS Markit shows that roughly half of the commonly traded crude oils in the United States have lifecycle emissions profiles similar to, or higher than, the Alberta average.
- Alberta compares favourably to the United States on emissions. A 2019 study by IHS Markit shows that roughly half of the commonly traded crude oils in the United States have lifecycle emissions profiles that are similar to, or higher than, Alberta’s average.
- Emissions technology is improving. A 2020 study by the University of Calgary and Stanford University found that emerging technologies can reduce the intensity of upstream in situ emissions by 14 to 19 per cent, compared to current technology.



Site rehabilitation program

As part of the effort to recover from the 2020 economic downturn, Alberta and Canada are using economic recovery dollars to benefit the environment. The Site Rehabilitation Program is helping to keep Alberta's specialized oil and gas labour force on the job, accelerating site abandonment and reclamation efforts, and quickly completing a high volume of environmentally significant work. **The program is expected to generate nearly 5,300 direct jobs.** Other businesses will see economic benefits from increased closure work in many rural areas.

- The program will provide up to **\$1 billion to oil field service contractors** to perform closure and reclamation work on wells, pipelines, and oil and gas sites.
- Private landowners and Indigenous communities can nominate inactive oil and gas sites for abandonment and reclamation work.

- Alberta is enhancing Indigenous participation in the program by:
 - establishing an Industry Advisory Committee, including representatives from the Indian Resource Council, to provide advice and feedback;
 - forming a roundtable with Indigenous oil field service companies to help connect them with communities needing service, while improving two-way communication and information;
 - and appointing a dedicated Indigenous liaison to answer questions from Indigenous companies during the application process, helping them to complete accurate and eligible applications.

Indigenous participation in Alberta's natural resource and energy development



Alberta is building strong partnerships with Indigenous communities as a key aspect of the province's process of reconciliation, inclusion and opportunity.

Indigenous consultation and participation are fundamental to Alberta's natural resource and energy development. Traditional Ecological Knowledge is considered in development decisions, and Alberta takes the duty to consult very seriously. By designing competitive processes that respond to Indigenous issues and include Indigenous perspectives, Alberta strives to maximize economic and social development in Indigenous communities. For example:

- Three Nations Energy is a corporation owned by Athabasca Chipewyan First Nation, Mikisew Cree First Nation and

Fort Chipewyan Métis Association. It completed Canada's largest off-grid solar farm, which will provide 25 per cent of the annual electricity needs of the hamlet of Fort Chipewyan. The project helped Indigenous tradespeople, workers and contractors to participate and build their skills in the green energy sector.

- Alberta's *Indigenous Opportunities Corporation Act*, through its capacity of **\$1 billion in loan guarantees**, helps Indigenous communities access capital and technical support for natural resource projects and infrastructure. The corporation's first loan guarantee was to a group of six First Nations, supporting their investment in the Cascade Power Project which, when completed, will supply eight per cent of Alberta's energy.

- Alberta established the Indigenous Litigation Fund with a capacity of **\$10 million to support Indigenous voices in legal actions** that affect responsible resource development.
- The Oil Sands Monitoring Program is a collaboration among governments, industry, Indigenous communities and others. It is **one of the most significant investments in environmental monitoring in the world**. The governance structure and monitoring program includes Indigenous communities and knowledge in various ways:
 - Indigenous communities participate on numerous committees: Oversight Committee, Science and Indigenous Knowledge Integration Committee, Indigenous Community Based Monitoring Advisory Committee, Technical Advisory Committees and Indigenous Caucus.
 - Indigenous communities submitted work plans for Community Based Monitoring Programs; in 2020-21. Fourteen community-based programs, totalling \$2.6 million, were approved, and eight communities expressed new interest in being involved.
 - A Capacity Building Facilitation Centre helps Indigenous communities train and learn the fundamentals of environmental monitoring. Athabasca University is developing online distance learning programs in community-based monitoring through a \$4 million grant from the Government of Alberta.
- The province and Indigenous communities have created cooperative management arrangements for long-term land sustainability and protection, including protecting the Ronald Lake bison herd, management of Writing-on-Stone Provincial Park, and others.

Indigenous Energy Highlights

In 2014-15, oil sands developments accounted for \$3.3 billion of business with 399 Indigenous-owned businesses in 65 communities in Alberta.

In 2016, 11,900 jobs were held by Indigenous workers in oil sands operations.

In 2016, oil sands companies contributed more than \$48.6 million in Indigenous Community Investment to support community programs and initiatives.

In 2017, Fort McKay First Nation and Mikisew Cree First Nation partnered with Suncor to buy a 49 per cent interest in Suncor's East Tank Farm Development, for \$503 million.

- In a spectacular opportunity for collaboration to conserve a highly valued area, Alberta's government, Indigenous Peoples and industry are discussing a potential expansion of Kitaskino Nuwenēné Wildland Provincial Park near Wood Buffalo National Park in northeast Alberta.
 - The expansion would add to the **largest continuous area of boreal protected land in the world** – maintaining habitats for species at risk, such as woodland caribou and wood bison.
 - To support the rights and culture of Indigenous Peoples, the environment, and the economy, we will reach out to Indigenous Peoples, stakeholders and the public on any potential expansion.



Carbon capture, utilization and storage (CCUS) and negative emissions technologies

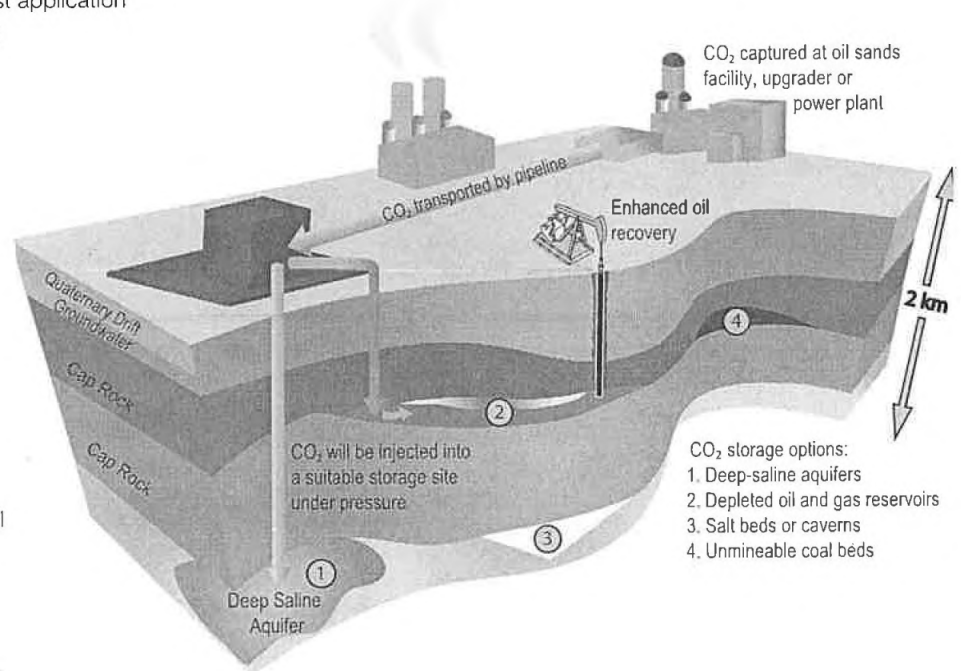
Alberta is a global leader in CCUS technology. This is widely acknowledged as one of the most cost-effective options for deep decarbonization of hard-to-abate industries, such as refining, fertilizer production and cement production. Alberta has ideal geographical conditions for carbon sequestration, is enhancing both policy and regulatory systems, and has made significant investments in commercial-scale CCUS infrastructure.

- Alberta gives industry an additional incentive to capture and permanently store carbon dioxide emissions through the CO₂ Capture and Permanent Storage in Deep Saline Aquifers emission offset (carbon credit) protocol.

Alberta also supports advancing and sharing knowledge related to CCUS innovation and technology.

• **To date, Alberta has committed \$1.24 billion to two commercial-scale CCUS projects:**

- The Quest Project is the world's first application of CCUS at an oil sands upgrading facility. **It has captured and safely stored five million tonnes (5.5 million US tons) of carbon dioxide in its first five years—more than any other industry CCUS facility in the world.**
- The Alberta Carbon Trunk Line project has the capacity to store up to 14.6 million tonnes (16.1 million US tons) of carbon dioxide annually. Carbon dioxide from a fertilizer plant and refinery travels by pipeline to mature oil and gas reservoirs 240 kilometres (149 miles) away, for use in enhanced oil recovery and permanent storage.



- The global NRG COSIA Carbon XPRIZE competition is a collaboration among United States-based NRG Energy, the XPRIZE Foundation, and Canada's Oil Sands Innovation Alliance. It encourages innovators to advance technologies to convert captured carbon into usable products. Competitors develop food and spirits, clothing and accessories, clean fuels and chemicals, household goods and building materials. The competition judges expect to announce the final round winner in winter 2021.
- The Alberta Carbon Conversion Technology Centre is a legacy of the NRG COSIA Carbon XPRIZE competition. Innovators from around the world test and develop technologies for converting CO₂ captured from a neighbouring electricity plant into commercially viable, value-added products.
- Carbon Engineering Ltd. was founded in Calgary in 2009 by University of Calgary and Harvard Professor David Keith. **The company partners with 1PointFive to jointly engineer the world's largest and first commercial-scale Direct Air-Capture facility in the United States.** The facility will be on 100 acres in Texas's Permian Basin and will capture up to one million tonnes (1.1 million US tons) of carbon dioxide a year.
- Alberta will explore further fiscal tools and policy options to accelerate carbon capture infrastructure and direct air-capture technology investment to help companies achieve net zero by 2050.



Hydrogen

Alberta's abundant natural gas reserves and significant investments in natural gas production and CCUS infrastructure allow for low-cost clean hydrogen production with one of the world's lowest carbon intensity footprints.

- Alberta is pursuing export markets for clean hydrogen derived products. **Alberta's Natural Gas Vision and Strategy²** has a goal to have large-scale clean hydrogen production and deployment in commercial applications by 2030.
- The Alberta Petrochemicals Incentive Program is part of Alberta's Natural Gas Vision and Strategy. The program provides grants of up to 12 per cent of a project's capital cost. Eligible projects include clean hydrogen production, carbon capture, and other innovative ways of producing and using Alberta's hydrocarbon resources.

² Alberta's Natural Gas Vision and Strategy lays out a plan for Alberta to become a global supplier of clean, responsibly sourced natural gas and related products including hydrogen, petrochemicals, and recycled plastics.



Electricity generation and use

Alberta has become a destination for renewable energy projects, with abundant wind and solar resources, and environmental policy that reflects a long-standing commitment to a fair, efficient and openly competitive electricity market. These created conditions for rapid expansion and profit from market-based renewables. The TIER program, industrial carbon price and Emission Offset System have increased incentives for renewable energy production.

- Alberta's open (energy only) power market pays companies to put electricity onto the grid. More importantly, non-Alberta based companies can participate and invest in renewable generation. Alberta and Texas are the only two energy-only markets in North America, which contributes to their leadership in renewables deployment.
- In 2019, the Alberta Utilities Commission reported that about 9.2 per cent of electricity generated in Alberta was from renewable sources.
- Alberta's wind-power electricity generation emission offset (carbon credit) protocol has generated more than **12 million tonnes (13.2 million US tons) of emission reductions since its implementation in 2008.**
- Electricity generation from micro-generation³ has increased **five-fold since 2015, with more than 6,000 active sites generating about 100 megawatts.** Farmers, businesses and homeowners can generate renewable electricity to meet their own energy needs and receive credits for additional electricity supplied to the electrical grid.
- When completed in late 2022, Suncor Energy's 400-megawatt Forty Mile Wind Farm in southeastern Alberta will be the largest wind installation in Canada. The project will deliver electricity to Alberta's grid, **reducing emission intensity by 30 per cent by 2030.**

Electricity Highlights

Alberta has over \$1 billion of utility scale renewable generation projects announced, representing over 1,200 megawatts of new generation since 2019.

By next year, there will be enough wind power under construction in Alberta to double 2019 levels.

Alberta expects 3,800 megawatts from wind and solar capacity by 2030.

- The Travers 400-megawatt solar project located in southeastern Alberta will be the **largest photovoltaic power station installation in Canada.** It also is expected to be completed by the end of 2022.
- Alberta is one of the leading jurisdictions in North America and the world in reducing emissions from coal fired electricity. Alberta requires the same TIER standards of all power generation. Combined with a highly competitive energy-only market, this has led to industry plans to end emissions from coal by 2023 through an aggressive program of retiring and repowering old coal plants. Just a couple of years ago, coal was the largest source of power on the Alberta grid. **Annual emissions from electricity generation are expected to decrease by 30 million tonnes (33 million US tons) from 2015 to 2023.**
- Alberta is committed to exploring emerging small scale nuclear power technology that will lower emissions and diversify the energy sector. This new and versatile technology could supply non-emitting, low-cost energy for a number of applications, including in remote communities and the oil sands.

³ To qualify as micro-generation under Alberta's Micro-generation regulation, a generating unit must use renewable or alternative energy sources, be intended to offset consumer load, and have a nameplate capacity that does not exceed 5,000 kilowatts.

- Since 2009, Alberta's Municipal Climate Change Action Centre has helped implement energy efficiency and renewable energy solutions to more than 300 organizations, such as municipalities, non-profit organizations and schools. With support from the TIER fund, the centre's projects **will avoid nearly 400,000 tonnes (440,000 US tons) of greenhouse gas emissions over the next 20 years.**
- MyHEAT provides users with visual information on the amount of heat leaving their homes, communities and

cities. It also educates users on how to improve their energy efficiency, save money, and reduce greenhouse gas emissions. The technology originated with a team at the University of Calgary. Their HEAT (Heat Energy Assessment Technologies) project won the MIT Climate CoLab's grand prize in 2013. Today, MyHEAT is being applied in Canada and the United States with thermal data collected in 55 North American cities,⁴ and measured waste energy data from millions of homes to help users take further energy and heat saving actions.



Minerals

Worldwide demand for metals and critical minerals is rising due to technological advancements, growing populations, and national security. Alberta has vast, untapped geological potential to provide minerals such as lithium, vanadium, uranium, and rare earth elements – many of which are used to manufacture batteries, cell phones and energy storage cells.

In early 2020, federal governments finalized the Canada–U.S. Joint Action Plan on Critical Minerals Collaboration to ensure

the future competitiveness of our minerals industries and to secure supply chains for the critical minerals needed for important manufacturing sectors, including communication technology, aerospace and defense, and clean technology.

Alberta is developing its provincial mineral strategy and action plan in 2021, building on the province's involvement with the Canadian Minerals and Metals Plan.

⁴ As of January 2021 MyHEAT has collected thermal data from cities in these provinces and states:

- Canada: Alberta, British Columbia, Saskatchewan, Ontario, New Brunswick,
- U.S.A: Illinois, Michigan, Washington, Wisconsin, New York.



Environmental stewardship

Alberta's environmental management systems ensure stewardship of our air, water, land and biodiversity with local and Indigenous communities, other governments and strategic partners.

- **Alberta was the first province in Canada to establish a department focused on environmental protection in 1971.**
- Alberta is a member of international partnerships related to environmental stewardship, such as The Climate Group, Pacific Northwest region partnerships, and international committees such as the Association of Fish and Wildlife Agencies Executive Committee.
- Alberta municipalities support sustainable development leadership. For example, Alberta's capital City, Edmonton, established the international Edmonton Declaration - Change for Climate. More than 3,400 global municipalities endorsed the declaration after Edmonton hosted the CitiesIPCC Science and Climate Change Conference, a first-of-its-kind climate change event for cities.

- Alberta's Chief Scientist provides oversight on Alberta's environmental monitoring and science program, as directed under Alberta's *Environmental Protection and Enhancement Act*. The authority and independence to report to the public are unique and reflect Alberta's commitment to transparency and excellence.
 - Alberta's independent Science Advisory Panel includes academic leaders from the United States, United Kingdom and Canada. The panel provides peer review and validation of science implementation to the Chief Scientist and Alberta's environment minister. It also guides scientific standards and processes to ensure they are credible and meet or set global best practices.
 - The Indigenous Wisdom Advisory Panel helps the Chief Scientist apply Indigenous knowledge and experience to Alberta's environmental monitoring, evaluation and reporting system.
 - Legislation requires the Chief Scientist to report the condition of the environment and to develop and implement an environmental science program.



Land

Alberta values and is committed to preserving its rich, diverse landscapes and biodiversity.

- **Over 15 per cent of the province is protected and conserved.**
- Alberta is committed to restoring habitat and protecting species at risk, providing enhanced protection for native trout species in the eastern slopes, recovering the greater sage grouse, and conserving woodland caribou under an agreement with Canada's federal government to maintain naturally self-sustaining populations.
 - Alberta's Wood Buffalo National Park is Canada's largest national park and one of the largest in the world. It is home to the largest herd of free-roaming wood bison and is an important nesting site for whooping cranes.

- Elk Island National Park has the second-highest density of hoofed mammals (bison, moose, deer, and elk) in the world, just after the Serengeti Plains of Africa.

Highlight

Alberta created the largest contiguous protected boreal area in the world, centered in the northeast near to many of the oil sands mines. More than 6.8 million hectares (16.8 million acres) of habitat are legislatively protected and conserved. That's an area larger than West Virginia and about 1.3 times bigger than the largest United States national park (Wrangell-St. Elias Park in Alaska).



Air

- Alberta's air quality health index enables excellent monitoring and fast response to province-specific activities and wildfire events. **Alberta's management approach has resulted in good air quality (low health risk) more than 95 per cent of the time.**
- Alberta established air quality management frameworks that set triggers and limits to manage the cumulative effects of development and protect human and ecosystem health.
- The Clean Air Strategic Alliance, groundbreaking in 1994, manages air quality in Alberta through a multi-stakeholder partnership of government, industry and Non-Governmental Organizations. It has earned awards for its consensus-based negotiation approach to inform policy and improve air quality.



Water

- Alberta has the largest irrigated land area in Canada. More than 70 per cent meet best water management practices, providing water to communities and supporting aquatic ecosystem health.
- The comprehensive Water for Life Strategy improved water conservation, efficiency and productivity by 32 per cent, reducing net water use during growing production output and populations.
- Alberta has 11 independent Watershed Planning and Advisory Councils covering all major river basins. The councils report on watershed health, lead collaborative planning, provide advice to governments and agencies on land and resource management, and facilitate education and stewardship.
- Alberta recently updated its flood mapping, covering 1,500 kilometres (932 miles) of river and more than 60 municipalities and First Nations communities.

In summary

Alberta has a well-established record of environmental protection and conservation that goes hand-in-hand with development of our energy resources.

Oil and gas companies operating in Alberta recognize the necessity of environmental stewardship and responsible energy production and distribution. Government policies and funding have led to companies committing to emission reduction targets and net-zero operations by 2050. **Innovations have already reduced carbon intensity by 22 per cent over the past decade and are estimated to reach a further 16 to 23 per cent in reductions by 2030.**

This progress is backed by world-leading technology research on university campuses, companies, and on the ground at worksites. Alberta's **Technology Innovation and Emissions Reduction fund** ensures rapid progress on new technologies to improve environmental protection and conservation.

Indigenous consultation and participation are at the forefront of decisions about new and established projects, supported by up to **\$1 billion in government loan guarantees**. Indigenous communities also play a vital part in the Oil Sands Monitoring Program for long-term land sustainability.

Alberta has a strong and proud reputation for stable governance and regulatory excellence, and for drawing investment from industry players who believe in environmental and social responsibility. As a member of international partnerships related to environmental stewardship, Alberta sees its role as a global leader in emission reductions. We also see our role as a reliable energy source to meet the demands of a growing market that might otherwise import energy from less environmentally-conscious jurisdictions.

Alberta will continue to take practical measures to address climate change while achieving economic objectives. **An investment in Alberta energy is an investment in real emissions reductions.**

California and Alberta: Strong Partners, Trusted Neighbors

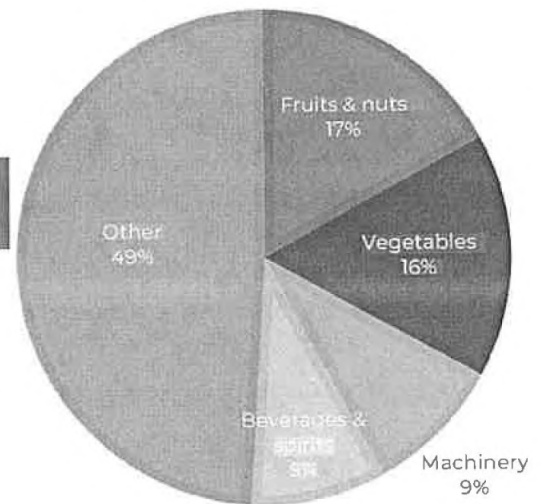


- **95,349** California jobs are supported by trade with Alberta
- **904,000** U.S. jobs are supported by trade with Alberta.

California – Alberta Trade \$USD

- Bilateral Trade: **\$3.9 billion**
- California exports to Alberta: **\$1.4 billion**
- California imports from Alberta: **\$2.4 billion**

Distribution of California Exports to Alberta



*Data from 2021

California's Top Exports to Alberta \$USD

- Fruits & nuts: **\$238.4 million**
- Vegetables: **\$230 million**
- Machinery & mechanical appliances: **\$131.3 million**
- Beverages & spirits: **\$131.2 million**

Alberta Snapshot

Critical Mass is a digital experience design agency with a relentless focus on the customer. Founded in Calgary in 1996, the agency has one of its 11 international offices in San Jose and a second in Los Angeles. For over two decades, Critical Mass has used design thinking, emerging technology, and customer empathy to drive engagement, loyalty, and business results for clients. From offices such as those in San Jose and Los Angeles, Critical Mass works with a variety of companies including Rolex, Nissan, and United Airlines to develop and expand their marketing capabilities and online presence. Their expertise spans Strategy Consulting, Experience Design, Marketing Communications, Implementation, and Marketing Science. Critical Mass is a part of the DAS Group of Companies.



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Florida and Alberta: Strong Partners, Trusted Neighbors



- **26,564** Florida jobs are supported by trade with Alberta
- **904,000** U.S. jobs are supported by trade with Alberta

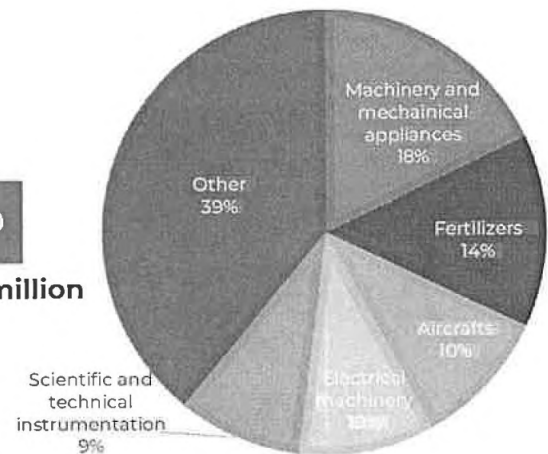
Florida – Alberta Trade \$USD

- Bilateral Trade: **\$433.5 million**
- Florida exports to Alberta: **\$138.6 million**
- Florida imports from Alberta: **\$295.2 million**

Florida's Top Exports to Alberta \$USD

- Machinery and mechanical appliances: **\$25.6 million**
- Fertilizers: **\$19 million**
- Electrical machinery: **\$14.5 million**
- Aircrafts: **\$13.7 million**
- Scientific and technical instrumentation: **\$12.3 million**

Distribution of Florida's Exports to Alberta



*Data from 2021

Alberta Snapshot

Network Innovations, headquartered in Calgary, Alberta, has branch offices in both Fort Lauderdale and Tampa, Florida which employ close to 50 individuals. They provide a variety of mobile and stationary satellite communications solutions for voice and data applications. These solutions improve communications and business operations which help their customers to reduce costs, expedite operational results, and improve safety conditions for their field staff. Network Innovations has developed both hardware and software solutions to enhance and integrate communications with a focus on Satellite Global Connectivity. They have partnered with numerous industry-leading companies, providing Network Innovations with direct access to extensive technical resources, enabling them to provide a high level of support for their customers.



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Georgia and Alberta: Strong Partners, Trusted Neighbors



- **23,740** Georgia jobs are supported by trade with Alberta
- **904,000** U.S. jobs are supported by trade with Alberta

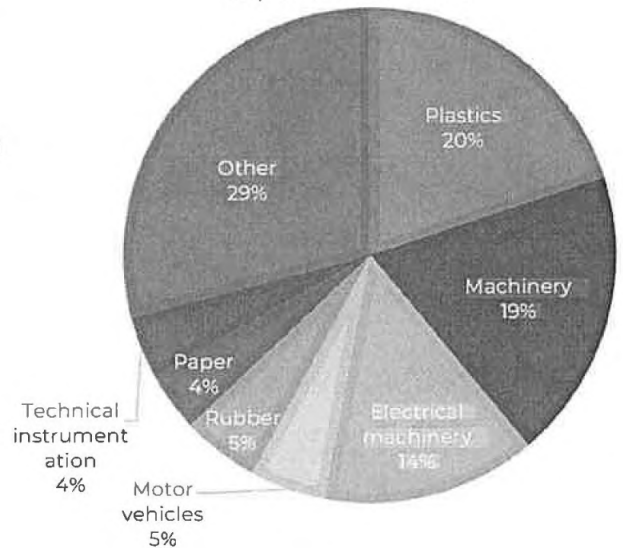
Georgia – Alberta Trade \$USD

- Bilateral Trade: **\$464.2 million**
- Georgia exports to Alberta: **\$154.1 million**
- Georgia imports from Alberta: **\$310.1 million**

Georgia's Top Exports to Alberta

- Plastics: **\$30.2 million**
- Machinery: **\$29.3 million**
- Electrical machinery: **\$22.1 million**
- Motor vehicles: **\$7.5 million**
- Rubber: **\$7.3 million**
- Paper: **\$6.4 million**
- Technical instrumentation: **\$6 million**

Distribution of Georgia Exports to Alberta



*Data from 2021

Alberta Snapshot

Located in Duluth, Epic Data develops and implements a broad range of software and hardware solutions for data collections and operations management in discrete manufacturing and warehousing control as an operational division of Calgary, Alberta-based Sylogist Ltd. Their customers are based throughout North America and Europe and cover a variety of industries including aerospace and defense, food and beverage, automotive, construction, and mining. Epic Data's professionals and service teams work in tandem with other companies' staff, often over the long term and spanning multiple projects, to optimize companies' business systems using their software and hardware solutions.



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Iowa and Alberta: Strong Partners, Trusted Neighbors



- **11,758** Iowa jobs are supported by trade with Alberta
- **904,000** U.S. jobs are supported by trade with Alberta
- Alberta is Iowa's 6th largest trading partner.

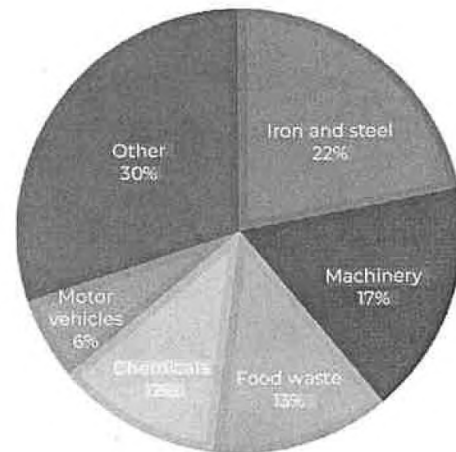
Iowa – Alberta Trade \$USD

- Bilateral Trade: **\$987.5 million**
- Iowa exports to Alberta: **\$141.7 million**
- Iowa imports from Alberta: **\$845.8 million**

Iowa's Top Exports to Alberta \$USD

- Iron and steel: **\$30.8 million**
- Machinery: **\$24.4 million**
- Food waste: **\$17.9 million**
- Chemicals: **\$17.4 million**
- Motor vehicles: **\$8.9 million**

Distribution of Iowa Exports to Alberta



*Data from 2021

Alberta Snapshot

Stantec is an engineering design and delivery firm headquartered in Edmonton, Alberta and maintains more than 400 offices worldwide, including two in Iowa. Stantec specializes in 89 different markets, from residential to retail and from water to oil and gas. The company's main objective is to balance innovation, creativity, and community to advance the quality of life in locations across the globe. The Iowa offices focus on water resources, hydraulic modeling, and geographic information systems, and also provides landscape architecture and urban design services that help encourage interaction with natural and built environments.



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Ohio and Alberta: Strong Partners, Trusted Neighbors



- **47,360** Ohio jobs are supported by trade with Alberta
- **904,000** U.S. jobs are supported by trade with Alberta

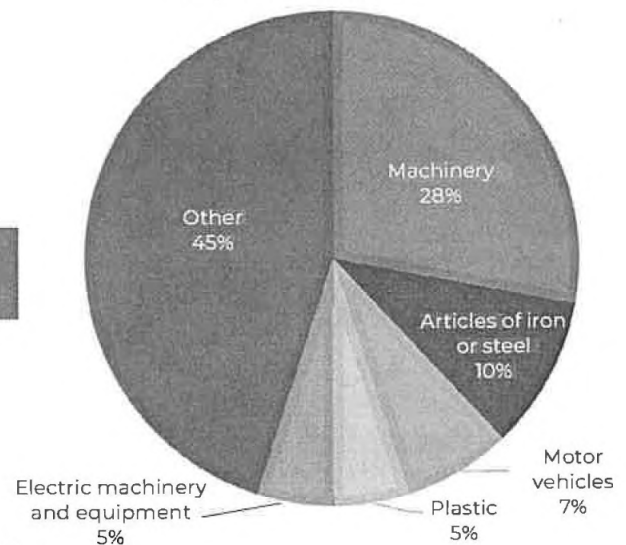
Ohio – Alberta Trade \$USD

- Bilateral Trade: **\$2 billion**
- Ohio exports to Alberta: **\$244.2 million**
- Ohio imports from Alberta: **\$1.8 billion**

Ohio's Top Exports to Alberta \$USD

- Machinery: **\$67.9 million**
- Articles of iron or steel: **\$24.4 million**
- Motor vehicles: **\$17.6 million**
- Plastic: **\$12.2 million**
- Electric machinery and equipment: **\$11.8 million**

Distribution of Ohio Exports to Alberta



*Data from 2021

Alberta Snapshot

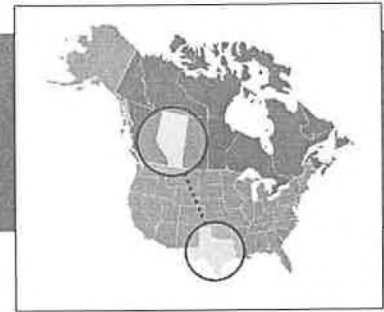
Stantec, an engineering design and delivery firm headquartered in Edmonton, Alberta, maintains more than 400 offices worldwide, including four locations in Ohio. Stantec's teams in Cincinnati, Cleveland, Columbus and Toledo work to improve Ohio's water systems, roads, buildings, and environmental preservation initiatives through projects such as the 5th Avenue Dam Removal and Olentangy River Restoration, the Britton Parkway Extension and the national FEMA Risk map production and technical services. Stantec specializes in 89 different markets, from residential to retail and from water to oil and gas. The company's main objective is to balance innovation, creativity, and community to advance the quality of life in locations across the globe.



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Texas and Alberta: Strong Partners, Trusted Neighbors



- **111,643** Texas jobs are supported by trade with Alberta
- **60,363** U.S. jobs are supported by trade with Alberta
- Alberta is Texas' 14th largest trading partner.

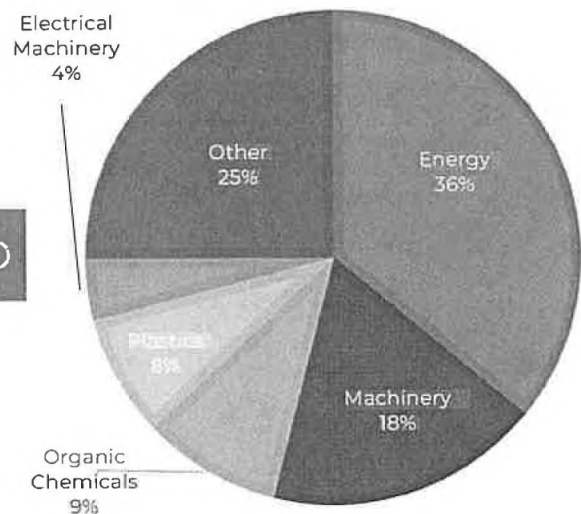
Texas – Alberta Trade \$USD

- Bilateral Trade: **\$10.2 billion**
- Texas exports to Alberta: **\$2.2 billion**
- Texas imports from Alberta: **\$8 billion**

Texas' Top Exports to Alberta \$USD

- Energy: **\$785.3 million**
- Machinery: **\$388.9 million**
- Organic Chemicals: **\$193.6 million**
- Plastics: **\$176.3 million**
- Electrical Machinery: **\$78.6 million**

Distribution of Texas' Exports to Alberta



*Data from 2021

Alberta Snapshot

Calgary-based Enbridge delivers more than 3 million barrels of crude oil and liquids every day, moving 30 percent of the crude produced in North America. Enbridge transports 20 percent of all natural gas consumed in the United States, moving natural gas across the country from fields all across Texas.

Enbridge produces enough electricity to power over 140,000 homes in Texas through its Keechi, Magic Valley and Chapman Ranch Wind Farms. These farms produce more than 562 megawatts of zero-emissions electricity. With the addition of this newest wind farm, Enbridge contributes to Texas being America's leader in wind energy with three times the wind generating capacity of any other state.

Enbridge employs more than 1650 Texans to move and produce energy from its 19 Texas-based operations. Its Houston headquarters invested more than \$1.2 million in Texas communities through its corporate and employee outreach programs in 2021 alone.



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