

GETTING ALBERTA BACK TO WORK

Natural Gas Vision and Strategy





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Premier's Message



Alberta is a land of opportunity – where innovation and hard work leads to success. Perhaps nowhere is this more apparent than with our energy sector. Yet, as the world's energy needs evolve, so too must the way we approach our role as a responsible energy producer.

Alberta is uniquely positioned to live up to this challenge. With our abundant resources and decades of experience, we have an opportunity to grow our petrochemical and plastics recycling sectors to produce much-needed products that support our lives, such as personal protective equipment, medical supplies, agricultural fertilizer, and computers. Through the production of low-emission hydrogen fuel and liquefied natural gas, we can also support the clean energy needs of communities around the world.

Alberta's Natural Gas Vision and Strategy is a key part of our government's plan to recover from a period of unprecedented economic adversity and take back control of our province's economic future. For decades, the natural gas sector has been a cornerstone of a strong Albertan and Canadian economy, contributing billions of dollars in revenue and hundreds of thousands of jobs. Our plan builds on these past successes by moving new opportunities for development forward across Alberta's value chain for natural gas. It will focus on increasing collaboration with industry and other governments, as well as fulfilling our commitment to be partners in Indigenous prosperity.

If recent global events have shown us anything, it's that the world needs reliable and democratic sources of energy. Canada must work together if we wish to be a leader in efficient and sustainable development of natural gas and get our products to global markets. We're already moving forward in this area with the construction of LNG facilities on our coastlines that will produce among the world's cleanest LNG in the world. In doing this, Canada is doing its part to reduce global emissions and improve the quality of life for people in less developed jurisdictions around the world.

Our government is doing everything in our power to secure a strong future for our natural gas sector because of the direct, positive impacts it makes in the lives of Albertans, Canadians, and those around the world. This is our promise.

Jason Kenney

Premier

Associate Minister's Message



This government was elected on a promise to revitalize Alberta's natural gas sector, bringing jobs and investment back to our province. Throughout the first 18 months of our mandate we worked with industry, bringing together diverse opinions to reach common goals and resolve ongoing issues like extreme price volatility and lack of access to the storage market. We took immediate action – implementing several key recommendations from the Natural Gas Advisory Panel's *Roadmap to Recovery* report, including the development of a universally adopted vision that can restore the direction and confidence of this critical sector.

Alberta's Natural Gas Vision and Strategy outlines actions we can take that will help position Alberta for the future by extending the value chain of our natural gas resources. Our plan builds on Alberta's existing strengths and welcomes new business in the form of petrochemical manufacturing, LNG and hydrogen production, and plastics recycling. It supports the *Alberta Recovery Plan* and corresponding *Investment and Growth Strategy* to attract job-creating private sector investment back into Alberta, diversify the economy, and get Albertans back to work.

Our plan also recognizes the important role that Canada can – and will – play to meet the growing demand for cleaner and sustainable energy around the world. It reinforces the importance of collaboration and innovation in order to propel our country's natural gas sector forward, improve on our already best-in-class environmental, social, and governance policies, and support a healthier and strong economic future for generations to come.

I want to thank the many individuals who contributed to the development of our vision and strategy. The strategy builds on this collaborative effort by identifying actions that will develop meaningful partnerships with industry, federal and provincial governments, and Indigenous communities. By continuing this work together, we can and will build back a stronger, more resilient natural gas sector.

This vision will help position Alberta as the preferred source of clean, secure, and ethically sourced natural gas for our province, our country, and the world.

Dale Nally

Associate Minister of Natural Gas and Electricity

Natural Gas Vision

Policy Statement

Vision: Alberta is the **preferred source** of clean, secure and responsibly sourced natural gas, **supplying domestic and global demand** for energy and a range of products across the natural gas value chain. Our integrated natural gas industry is future-focused, **enabling new business opportunities** while providing critical resources to improve modern life in Alberta, Canada and across the globe.

The global energy system is undergoing unprecedented change and natural gas will play a vital and lasting role in delivering energy security and improving environmental outcomes for billions of people. Alberta is strongly positioned to advance emerging natural gas technologies and compete in evolving global markets. Alberta has abundant natural gas resources, a highly-skilled workforce and an experienced and innovative industry. The province's unique geology has enabled world-leading advancement in commercial scale carbon capture and storage utilization.

Alberta will **strongly advocate for natural gas development in Canada**, building valued partnerships within the western provinces and across Canada for the expansion and innovation of our low-cost, low-carbon natural gas value chain. We will promote its ability to provide vital consumer products, energy security, poverty reduction, and improved environmental outcomes.

We will **relentlessly pursue investment and improve our competitiveness**, to expand Alberta's access to new markets and position a more diversified, resilient natural gas sector, supply chain and petrochemicals industry in the face of emerging opportunities and shifting global markets, including advancing clusters and designated industrial zones.

Consistent with our commitment to Indigenous partnership in energy prosperity, we will **enable meaningful involvement and investment** in natural gas development across the full value chain and over the life cycle of projects to benefit communities now and in the future.

Alberta will continue to **implement best-in-class environmental frameworks**, globally recognized environmental standards, and world-leading responsible practices for the natural gas value chain.

The province will **drive towards an efficient regulatory environment** with well-aligned and streamlined federal, provincial and municipal regulations. Stable, predictable and jurisdictionally competitive regulation will maintain flexibility to welcome innovation within the natural gas sector - both across the province and in targeted industrial clusters and designated industrial zones.

We will become a **global leader in energy literacy**, promoting understanding of the economic, environmental and social benefits of the natural gas value chain.

Alberta will increase natural gas demand by **advancing new, expanded and circular pathways** to support and spark growth in:

- petrochemical manufacturing and plastics recycling for vital consumer and life-enhancing products
- liquefied natural gas and the emerging hydrogen economy
- further industrial uses that require the production of natural gas

Introduction - Case for Change

The Natural Gas Vision and Strategy nests within *Alberta's Recovery Plan* to create jobs, build and diversify the economy. It reflects Alberta's high environmental, social, and governance standards for energy development.



The global energy system is undergoing unprecedented change. As one of the cleanest carriers of energy, natural gas will play an integral and lasting role in bringing energy security and environmental outcomes to billions of people around the world. To grow market share and expand domestic consumption, Alberta needs a new strategy for natural gas - one that develops strong provincial and national partnerships, restores the vitality of the upstream sector, expands the value chain and bridges into new business models.

In creating this strategy, Alberta engaged broadly with the natural gas sector – producers, midstream companies, consumers of natural gas and gas marketers. Alberta also connected with industry associations, academia, municipalities and Indigenous representatives.

This strategy begins where the Natural Gas Advisory Panel (NGAP) report *Roadmap to Recovery: Revitalizing the Natural Gas Sector* ends: it aggregates their advice with recent intelligence and the Government of Alberta's commitment to bring jobs and investment back to the Alberta economy.

Alberta will foster increasing natural gas demand as we **seek to advance new and expand existing value chains** to promote growth in industrial demand, petrochemical manufacturing, domestic and global liquefied natural gas, plastics circular economy, and the emerging hydrogen economy.



Alberta will bring a whole-of-government focus on:

- Continuing efforts to resolve the remaining system barriers identified by the NGAP so the sector can attract investment and move gas to markets;
- Driving increased investment in Alberta's natural gas value chain in order to enable significant economic growth within Alberta and value-add to Canada and investors;
- Accelerating natural gas deployment into new markets including petrochemicals, liquefied natural gas (LNG), and hydrogen;
- Enabling improved value-chain integration and alignment from research and development to innovation and industrial;
- Deployment of new technologies; and,
- Positioning Alberta to build alliances and coalitions with industry, other provinces, the federal government, and Indigenous communities to ensure Alberta's natural gas resources and related products (such as hydrogen, advanced recycled plastics, petrochemicals) can access and compete in international markets and attract international investment.

Introduction - Case for Change

Sector Strengths



For more than 100 years, natural gas has been the cornerstone of Alberta's energy economy. It is central to oil sands production, power generation and petrochemical processes. At its peak in the 2005/2006 fiscal year, the Government of Alberta collected C\$8.4 billion in natural gas and by-product royalties. In 2006, Alberta produced 14.1 billion cubic feet per day of natural gas, contributing significantly to Alberta's economy. However, a lack of pipeline access, construction delays for additional capacity, and increased competition from the United States has forced Alberta natural gas producers to lose market share and sell their product at a discount. In 2019/20 the Government of Alberta collected only C\$371 million in natural gas and by-product royalties, and production had fallen to 11.1 billion cubic feet per day. To ensure the long-term success of Alberta's natural gas sector, we are taking advantage of our proven strengths, which include:

- Technologically advanced and innovative upstream natural gas sector, and service and supply sectors driving ground-breaking technologies to reduce emissions and capture carbon (carbon capture, utilization and storage [CCUS]);
- Low natural gas production costs;
- Abundant natural gas liquids resources for conversion to petrochemicals or for use in oil sands production;
- Strong environmental leadership and management;
- Abundant natural gas supply for power generation and hydrogen production;
- World-scale petrochemical production, based on ethane, methane, and soon, propane;
- Extensive natural gas transmission, distribution, fractionation and storage infrastructure that provides opportunities to introduce complementary value chains (hydrogen and plastics recycling) into the provincial energy economy;
- Highly skilled workforce in the extractive, processing, transportation infrastructure, and services sectors;
- Innovative energy technology and research capabilities enabled through innovation funding; and
- Established interconnections to eastern Canadian, North American and global markets. Western Canadian natural gas and petrochemicals are closer to the growing Asian markets than U.S. competitors.

This strategy leverages the province's historic strengths within the emerging energy system's market opportunities. It is oriented on the future – on areas within the natural gas value chain that hold significant potential for wealth generation, investment attraction, and growth. It also positions Alberta to support local, regional and national markets – improving and securing domestic supply chains during times of global supply disruption.

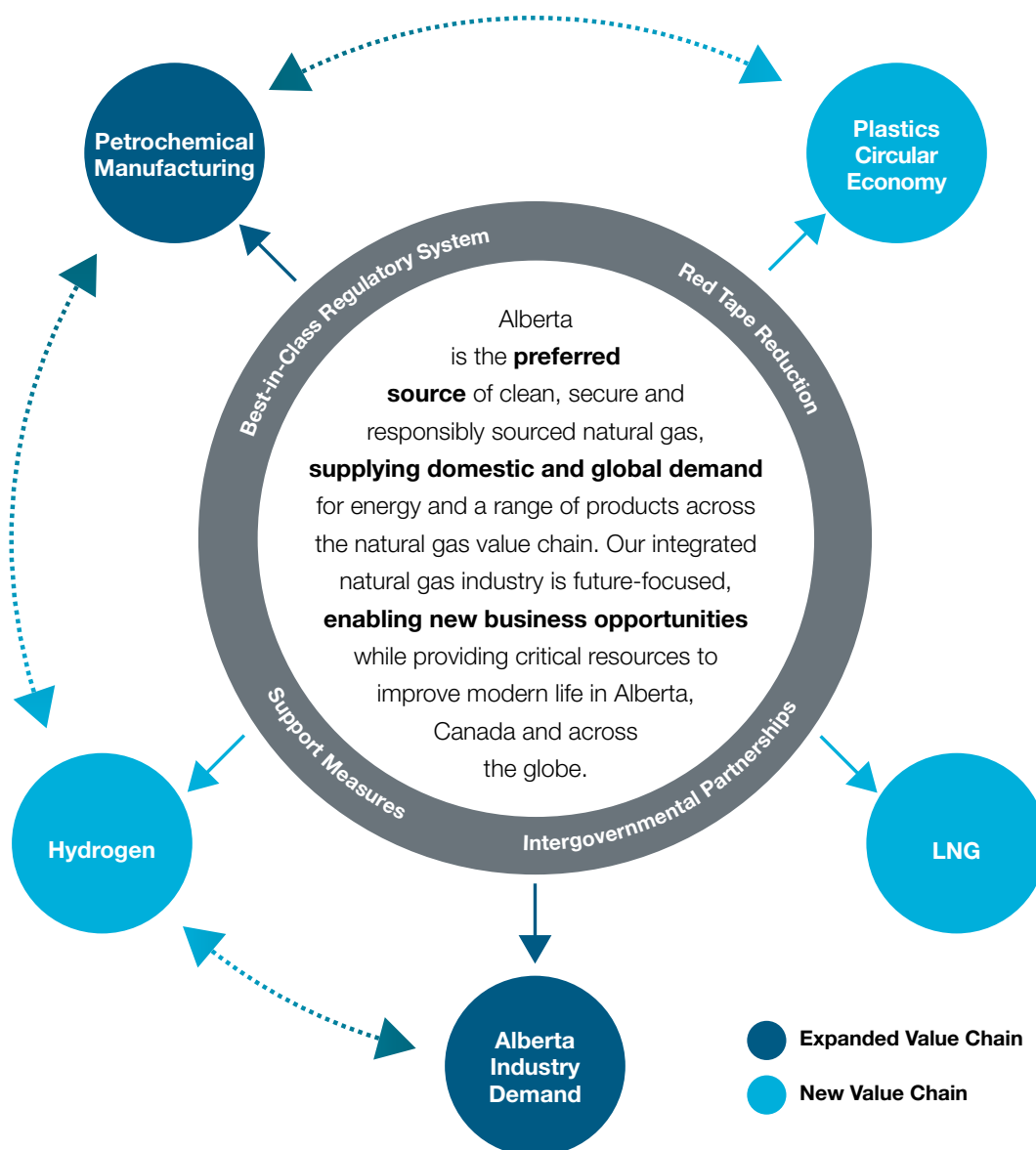


Figure 1: Alberta's Natural Gas Value Chain Target Area

Key Growth Areas

Petrochemicals



Petrochemicals manufactured in Alberta make food safe to eat, the delivery of healthcare possible, and underpin the modern world. Increasing low-carbon petrochemical and hydrocarbon-related chemical manufacturing in Alberta improves quality of life globally, and creates significant economic activity for our province, resulting in increased GDP, more permanent and high-paying jobs, and increased government revenues.

Goal: Alberta becomes a global top 10 producer of Petrochemicals, and expands and diversifies the current portfolio of products manufactured.

Opportunity

- Alberta's petrochemical sector makes the inputs for many essential products (e.g. plastics, medical supplies, fertilizers, eyeglasses, vehicle air bags, personal protective equipment (PPE), flooring); and accounts for around one-third of manufacturing exports.
- Alberta's chemicals sector, comprised predominantly of petrochemicals, was valued at C\$12.1 billion and employed about 58,400 people directly and indirectly in 2019.
- Global demand for petrochemical products is expected to grow. There is an opportunity to grow Alberta's petrochemical sector by more than C\$30 billion by 2030, resulting in more than 90,000 direct and indirect jobs over the construction and operation periods of new facilities, and more than C\$10 billion in revenue for the Government of Alberta from corporate and personal income taxes.
- Alberta has considerable expertise in producing low-cost, low-emissions petrochemical products.
- Many products, such as Methanol and Ammonia, represent low-emissions fuels and additives that help support sustainable petrochemical development and fertilizer production.
- Advanced materials applications help to reduce emissions from across the value chain. For example, lighter and more fuel-efficient cars made from polymers reduce greenhouse gas emissions.
- Alberta's carbon capture infrastructure and geology position it to enable lower-emission petrochemical processes.

Economic Impact

- Canada's petrochemicals sector realized approximately C\$20 billion in investment over the last ten years. In comparison, the United States realized C\$250 billion (StatsCan, US Census Bureau, 2019).
- The Alberta government is supporting approximately C\$11 billion worth of new petrochemical investments with up to C\$650 million in financial incentives under the first and second rounds of the Petrochemicals Diversification Program.
- Investment to date in the petrochemicals sector in Alberta has resulted in positive final investment decisions for two propane based petrochemical facilities.
 - Construction on Inter Pipeline's petrochemical complex is well underway and the facility is expected to be in operation at the end of 2021.
 - » As of the first quarter of 2020, approximately C\$2.5 billion has already been invested in the project and 1,800 workers were on site.
 - Pembina Pipeline Corporation has deferred investment in its downstream project, but it is expected that downstream investments will be considered once the company is ready to redeploy.



Photo credit: Inter Pipeline

Actions

Short-term Actions (Fall 2020)

- Conclude targeted engagement with industry stakeholders on the Alberta Petrochemical Incentive Program (APIP) to finalize the technical design of the program.
- Officially launch the Alberta Petrochemicals Incentive Program in fall 2020.

Medium to Long-term Actions (Fall 2020 throughout 2021 and beyond)

- Facilitate the development of key industrial clusters that will expand the petrochemical and value-add industrial sector within Alberta.
- Develop regional infrastructure plans to enable rapid deployment of smaller scale derivative / chemical facilities within larger industrial clusters to take advantage of critical petrochemical feedstock opportunities.
- Pursue increased research and development and innovation opportunities with industry and academia.
- Actively pursue targeted investment of petrochemical projects that will expand Alberta's chemical manufacturing base to support growing industrial and pharmaceutical opportunities.
- Initiate a national discussion with provinces, the federal government and railways on opportunities to expand and optimize rail transportation networks to better deliver product to national and global markets.

Key Growth Areas

Plastics Recycling (advancing a plastics circular economy)



As a responsible producer of plastics, Alberta will actively pursue efforts to divert plastics as a new value stream, creating jobs and generating government revenue while decreasing environmental impacts from plastics waste. This includes pursuing the Zero Plastic Waste outcomes identified by the Canadian Council of Ministers of the Environment, and advancing a plastics circular economy. These efforts will contribute to the global fight against plastic waste, improving environmental outcomes while advancing critical economic opportunities in Alberta and Canada.

Goal: Alberta is established as the Western North America centre of excellence for plastics diversion and recycling by 2030, including:

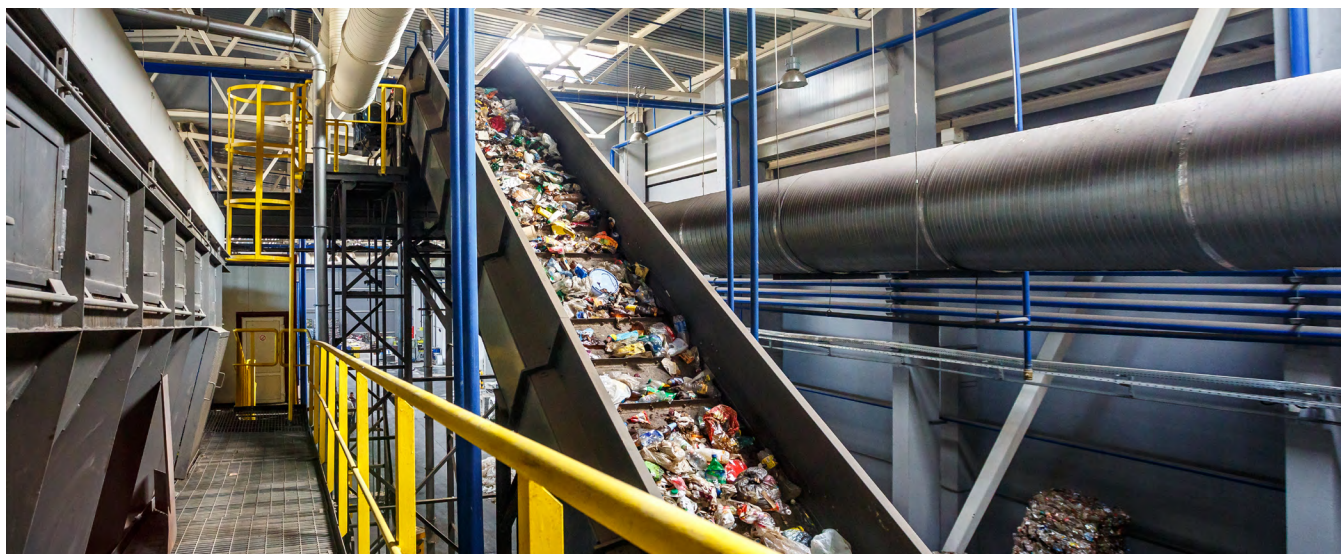
- Advanced chemical and renewable, low-carbon plastics recycling research and deployment;
- Province-wide plastics recycling and diversion systems in place; and,
- Cross-jurisdictional coordination of plastics diversion and advanced recycling that achieves critical economies of scale.

Opportunity

- Global demand for recoverable waste materials has greatly reduced with fewer countries accepting waste. North America's domestic waste processing capacity is currently limited. Alberta can utilize its petrochemical and research and innovation sectors to capitalize on this opportunity.
- As the recent global pandemic has demonstrated, the need for responsibly produced plastics is more important than ever to support safe food handling practices, the production of personal protective equipment and many other life-enhancing and sustaining products.
- The petrochemical industry is responding to the plastics circular economy opportunity, taking stewardship and accountability over plastics end-of-life management seriously. This includes investment in innovation, including research and pilot projects to advance plastics recycling, and alliances and programs to manage plastics waste and promote solutions.
 - The Plastics Alliance of Alberta – comprised of key stakeholders from industry, academia and government – was recently established to support actions required to develop a plastic circular economy in Alberta.
 - Industry established the Alliance to End Plastic Waste – a global not-for-profit organization that plans to invest C\$1.5 billion over the next five years in research and development to help reduce plastic waste.
- It is clear the problem is not plastics. It is plastics waste. As Canada's largest and most technologically advanced plastics manufacturer, Alberta is well positioned to demonstrate domestic and global leadership to reduce waste through plastics recycling and repurposing.
- Alberta's leadership in reducing plastics waste will help Alberta address growing concerns, such as:
 - Approximately 95 per cent of plastic packaging, valued at C\$100-\$150 billion, is lost due to disposal after a single use.
 - In Canada, 25 per cent of plastic waste is collected for diversion from landfill; nine per cent is successfully recycled.
- The move towards a circular plastics economy will capture and retain the value of plastics across their lifecycle, while supporting Canada's commitment to 100 per cent reusable, recycled plastics by 2030, as part of the G7 Ocean Plastics Charter. Managing plastic waste by developing markets through industry-operated recycling programs, such as extended producer responsibility (EPR), will allow the continued production of plastics for new products.

Economic Impact

- According to a report by Environment and Climate Change Canada (ECCC), 86 per cent of plastics were landfilled in 2016. This represents a C\$7.8-billion lost opportunity.
- A study completed by Deloitte and ChemInfo Services Inc. for ECCC stated that by recycling 90 per cent of Canada's plastic waste recycling by 2030, including a significant increase of advanced chemical recycling, the plastic recycling industry would see increases of:
 - Revenue from C\$500 million to C\$3 billion; and
 - Direct jobs from 10,000 to 27,000.
- A study completed by Eunomia Research and Consulting indicated 4,500 direct full-time equivalent jobs are created in the province as a result of existing recycling activities with a further 1,600 indirect and 1,400 induced jobs, for a total of 7,500 jobs.
- Possible future economic benefits from increased recycling are C\$1.4 billion and approximately 13,300 jobs (direct, induced and indirect)
- The Alberta Urban Municipalities Association completed the Alberta Collaborative Extended Producer Responsibility Study to understand potential impacts of implementing EPR for packaging and printed paper in Alberta.
 - The study estimated benefits of increased waste diversion, including reduced recycling unit costs and greenhouse gas emissions, with an increase in the sector's contribution to Alberta's GDP from C\$132 million to C\$148 million.



Actions

Short-term Actions (Fall 2020–Winter 2021)

- Engage with industry, municipalities and related associations to investigate industry-led plastics waste management solutions in Alberta.
- Collaborate with the federal government to develop effective policies and explore opportunities around achieving realistic waste reduction targets.
- Examine waste reduction in the context of a circular economy to:
 - Allow Alberta to grow its plastics feedstock “watershed” to allow sufficient economies of scale to facilitate advanced chemical recycling opportunities.
 - Reduce risk of negative investment signals to petrochemicals industry.
- Explore partnership opportunities with recycling associations, municipalities, plastics associations, academia and industry to advance plastics diversion and recycling research and development, innovation and technology deployment.
 - Signal advanced chemical recycling and a plastics circular economy as a focal area within Alberta’s innovation system.

Medium-term Actions (2021–2022)

- Deploy joint funding and other private/public supports to advance initial pilot and demonstration projects in key industrial regions, such as Fort Saskatchewan, Red Deer, Medicine Hat and Grande Prairie.
- Support research and development of reducing emissions and waste streams, and improve energy efficiency and the competitiveness of Alberta’s plastics industry.
- Identify and address other provincial policy, legislative and regulatory barriers to achieving recycling goals.
- Promote successful research outcomes to explore and pursue international partnership and investment opportunities within the circular economy.

Long-term Actions (2022 and beyond)

- In partnership with industry and municipalities, begin to accelerate commercial deployment of advanced chemical recycling technology, as well as infrastructure build-out in industrial areas.

Key Growth Areas

Alberta Industry Demand



Natural gas and natural gas liquids are fundamental inputs to Alberta's electricity, oil sands and other industrial sectors, including the petrochemicals, cement, and the greenhouse industries. These sectors represent over half of Alberta's domestic natural gas demand and are expected to grow. By replacing coal with natural gas and advancing industrial processes, including co-generation, Alberta will see lower greenhouse gas (GHG) emissions and improved environmental outcomes.

Goal: Intra-Alberta demand for natural gas and natural gas liquids grows with increased investment in midstream natural gas processing infrastructure. Natural gas transmission and distribution infrastructure additions occur faster, improving industrial performance and growth.

Opportunity

- Alberta's industrial consumption represents an opportunity for the province to guide orderly and sustainable market and infrastructure development to provide long-term benefits for the province.
- Power generation facilities continue undergoing coal-to-gas conversions, with a majority of coal-fired electricity being replaced by natural gas as a fuel source.
- Alberta's oil sands are a vital market to the natural gas sector. Natural gas production also supplies condensate/diluent to the oil sands and is a primary input for natural gas-intensive in-situ projects, which represent 50 per cent of bitumen production in 2019 and about 67 per cent of projected growth of bitumen production in 2029.
- Producer netbacks from selling into the Alberta market are expected to remain strong in the face of increasing competition from US production in North American markets.

Economic Impact

- The Alberta Energy Regulator's most recent forecast, published in June 2020, shows natural gas consumption in electricity generation will increase from 1.2 billion cubic feet per day (bcf/d) in 2019 to 1.9 bcf/d in 2029.
- Oil sands production is forecast to grow from approximately 3.1 million barrels per day (bbl/d) in 2019 to 4.0 bbl/d in 2029. As oil sands production increases, so will the associated natural gas consumption over the same period (from 1.9 to 2.7 bcf/day) to support oil sands processing activities.
- Additional demand growth is expected to maintain and increase activity in the upstream, midstream, and downstream sectors. For the 2019-2029 forecast period, demand for natural gas from petrochemical plants in Alberta is expected to increase by an average rate of 1.3 per cent per year due significantly to the addition of two projects announced as part of the Petrochemicals Diversification Program (PDP). As the PDP transitions to the market-based Alberta Petrochemicals Incentive Program, additional projects will further increase natural gas demand and infrastructure needs.



Actions

Short-term Actions (Fall 2020–Winter 2021)

- Work with the Canada Energy Regulator to identify initial actions to address regulatory challenges and delays in sourcing natural gas supplies for proposed coal-to-gas conversions, including opportunities to improve processes for other incremental expansions and debottlenecking initiatives.
- Assess the current state of Alberta's aging rural pipeline infrastructure to identify areas of priority and develop preliminary recommendations in support of enabling a reliable supply of natural gas to rural, Indigenous and remote communities.
- Pursue federal agreement to remove impact assessment requirements for new natural gas generation that will displace coal-fired generation as existing processes have proven they can delay the environmental benefits of new gas generation coming online in Alberta.

Medium to Long-term (2021 and beyond)

- Implement programs and appropriate support mechanisms to incent additional investment in Alberta's midstream processing infrastructure and petrochemical industries in order to enable processing of natural gas and natural gas liquids for internal and export markets.
- Where feasible, execute Government of Alberta's regulatory oversight for approval of pipeline connections to units converting to natural gas.
- Continue working with the Canada Energy Regulator to address regulatory barriers for coal-to-gas conversions and access to rural gas supplies.
- Support actions that enable industrial clusters and designated industrial zones to develop planned and future projects in a timely manner and increase efficiencies of scale. This includes opportunities to encourage conditions that lower costs, promote orderly industrial development, and provide stable regulatory conditions to spur further investments.

Key Growth Areas

Liquefied Natural Gas (LNG)



Photo credit: Ferus NGF

Secure, clean, and responsibly sourced LNG from Canada will advance energy security for global consumers, facilitate a transition from emissions-intensive fuels such as coal, and help meet increasing global energy demand. Alberta's natural gas is produced with the highest environmental and human rights standards in the world. Our industry works in partnership with communities – including First Nations and Métis – investing in cutting-edge technology and practices to sustainably produce our gas. LNG from Canada will have the fewest environmental impacts and emit no particulate matter when combusted, resulting in improved health outcomes for billions of people. Global LNG markets offer unparalleled economic development opportunities for Canada by leveraging western Canadian natural gas resources to advance nation-building LNG projects. LNG will also provide critical egress for western Canadian natural gas, allowing for expanded use of natural gas liquids in value-add industries.

Goal: Alberta's natural gas has access to Asian and European markets through two to three additional mega LNG projects by 2030.

Opportunity

- The mid to late 2020s are the next window for significant new LNG supply.
- Alberta has abundant natural gas reserves and in 2018, Alberta produced about two thirds of natural gas in Canada. Access to markets through LNG will result in growth for Alberta's natural gas sector, with increased jobs, investment, government revenues, and industry activity.
- Canadian LNG can outcompete marginal suppliers in Asian and European markets. Canada provides a competitive environment for the LNG industry with favourable tax treatment for developers and extended export license terms.
- Canada has a distinct distance advantage with the shortest routes to Europe and Asia from the East and West Coast respectively as compared to that of U.S. Gulf Coast LNG projects.
- Canadian LNG project proponents have all committed to producing low or zero-carbon, low-cost LNG.
- LNG projects offer considerable opportunity for Indigenous participation and can provide communities with significant and meaningful economic and social benefits.

Economic Impact

- The Conference Board of Canada estimates¹ that 56 million tonnes per year of Canadian LNG production would bring the following benefits:
 - Increasing Canada's Gross Domestic Product (GDP) by an average of more than C\$11 billion per year over the 2020-2064 timeframe.
 - Increased national employment by adding 96,550 annual jobs.
- The Canadian Association of Petroleum Producers² estimates that on an annual average basis, every billion cubic feet per day of incremental production to serve LNG export, could add:
 - C\$2.4 billion towards Canada's GDP in direct or indirect activity annually;
 - Employment growth on a national level by 10,000 direct or indirect jobs; and
 - Annual provincial and federal government revenues (corporate, personal, indirect taxes and royalties) of C\$340 million.
- As LNG projects are expected to either produce or consume natural gas produced in Western Canada, these projects have the economic potential to benefit Alberta in terms of upstream investment, price uplift, and royalty revenues.
 - The Conference Board of Canada estimates that a 56 million tonnes per year investment in British Columbia LNG capacity over the next 30 years can translate into Alberta's annual GDP increasing by C\$1.6 billion. The largest gains are expected to be in the upstream sector, representing C\$800 million in annual GDP gains.
 - Under the same projections, Alberta employment could increase by 9,240 jobs with the majority generated in the upstream sector.
 - Alberta's government revenue impact is projected to total C\$127 million and average annual wages could rise by C\$809 million in Alberta.

¹ A Changing Tide: British Columbia's Emerging Liquefied Natural Gas Industry, The Conference Board of Canada, February 29, 2016

² Leveraging Opportunities: Diversifying Canada's Oil and Natural Gas Markets, The Canadian Association of Petroleum Producers, 2018 Economic Series



Actions

Short-term Actions (Fall 2020–Winter 2021)

- Formalize intergovernmental collaboration to advance Canadian LNG projects and activate federal funding support.
- Work directly with proposed LNG projects to support their unique needs and accelerate investment decisions.
- Collaborate with Alberta agencies such as the Alberta Petroleum Marketing Commission and Alberta Indigenous Opportunities Corporation to enable the movement of Alberta gas to the east and west coasts.

Medium to Long-term Actions (2021 and beyond)

- Provide active, targeted support to LNG-related pipelines and projects going through federal regulatory processes.
- Facilitate introductions to support the establishment of producer-operator partnerships and off-take agreements.
- Seek to optimize existing pipeline connections to facilitate Alberta natural gas moving east and west.
- Work with the Governments of Canada and British Columbia to advance opportunities for carbon reduction benefits through bilateral or Paris Accord instruments.
- Facilitate investment from, where appropriate, the Government of Alberta, other governments, industry, Indigenous peoples, and domestic and international public financial institutions.

Key Growth Areas

Hydrogen



Photo credit: Shell Canada | Quest carbon capture and storage facility at the Scotford Upgrader

Developing a robust clean hydrogen economy can unlock significant economic value for Alberta and Canada, while advancing critical environmental outcomes. Deploying hydrogen into the transportation and home-heating sectors, and incorporating it as fuel for electricity generation and other industrial processes, is key to Canada's ability to meet GHG reduction targets under the Paris Accord. Growing demand for hydrogen provides Alberta with a new strategic opportunity to expand and integrate its natural gas value chain. This will benefit Albertans, Canadians and the world by creating jobs, generating government revenue and contributing clean fuel to the global economy.

Goals: Large-scale hydrogen production with carbon capture, utilization and storage (CCUS) and deployment in various commercial applications across the provincial economy by 2030.

Goal: Exports of clean hydrogen and hydrogen-derived products to jurisdictions across Canada, North America, and globally are in place by 2040.

Opportunity

- Global demand for hydrogen could increase ten-fold by 2050.
- Alberta is one of the world's largest producers of hydrogen for domestic industrial processes, including petrochemical manufacturing.
- Alberta has considerable expertise in producing and using low-cost, low-emissions hydrogen. Independent analysis suggests Alberta can be one of the lowest cost producers of hydrogen in the world.
- Alberta's unique geology can facilitate additional carbon sequestration or utilization from hydrogen production.
- Alberta has existing hydrogen and carbon dioxide transportation and sequestration infrastructure. Examples include Air Products' Heartland Hydrogen Pipeline, the Alberta Carbon Trunk Line, and the Quest Carbon Capture and Storage project.
- Low-cost carbon dioxide captured from hydrogen production can enable enhanced oil recovery, and Alberta is actively pursuing innovation in other uses of captured carbon dioxide.
- Segments of Alberta's energy sector are already selectively deploying or piloting hydrogen technology.
- Momentum is building and Alberta could be a leader in domestic heavy transport decarbonisation, and clean hydrogen production for industrial, electricity and residential heating demands.
- Hydrogen-derived products, such as methanol and/or ammonia, provide additional opportunity to increase the value of these resources. Methanol is the fastest growing product of the global primary chemical production. These resources do not require new-dedicated transportation infrastructure.

Economic Impact

- The Hydrogen Council anticipates a US\$2.5 trillion annual market for hydrogen and related equipment as well as 30 million jobs created in the global hydrogen economy by 2050.
- The Roadmap to a U.S. Hydrogen Economy suggests the hydrogen economy in the U.S. could generate:
 - US\$140 billion per year in revenue and 700,000 jobs by 2030;
 - US\$750 billion per year in revenue and 3.4 million jobs by 2050.
- Additional analysis is required to determine the specific economic opportunity in Alberta.



Actions

Short-term Actions (Fall 2020–Winter 2021)

- Build alliances and map Alberta's hydrogen system to determine deployment pathways, partnerships, barriers and gaps (commercial, technology, and policy), technology development opportunities, and targets.
- Establish common interests and partnership opportunities with the Government of Canada, including incorporating Alberta's interests into a federal hydrogen strategy, to accelerate hydrogen deployment in Alberta and other provinces.

Medium-term Actions (2021 throughout 2023)

- Develop a Hydrogen Roadmap for Alberta detailing best deployment pathways, enabling policies, innovation strategy and funding support.
- Build support among western Canadian provinces to align policy to accelerate the deployment of hydrogen in western Canada.
- Remove red tape to be inclusive of hydrogen deployment and pass enabling policy, legislation, and standards.
- Working with industry, advance pilot projects and early demonstration projects, including supporting infrastructure, to build momentum.
- Explore opportunity to accelerate joint federal/provincial private sector funding to stimulate initial build-out of the provincial hydrogen economy.
- Investigate and consider opportunities for hydrogen as part of overall approach to the LNG export value chain.

Long-term Actions (2023 and beyond)

- Partner with industry leaders to accelerate scaling up and commercial deployment, as well as infrastructure build-out, for key target end-use applications. This includes exploring opportunities for broader hydrogen transportation utilizing existing natural gas infrastructure and pipeline corridors.
- Partner with other governments to ensure hydrogen transmission across Canada is enabled along dedicated economic/resource corridors.
- Attract and secure a world-scale hydrogen for energy export project to Alberta.

