

Alberta's Roadmap *to the* New Energy Economy

Embracing the opportunities
for every Albertan

February 2023

Can Alberta capitalize on the benefits of the new energy future?

Alberta has always been an international leader on energy. Our abundant natural resources, coupled with our proud history of technological innovation in the oil and gas sector — particularly the oilsands — means we are renowned for our ability to use a skilled labour force to reach new frontiers in energy production.

In 2023, Alberta has an opportunity to build on that history and move towards a new energy future. In doing so, it can begin to capitalize on the multiple opportunities associated with the globally emerging clean economy.



To achieve this, Alberta needs a robust, credible plan on climate and energy. The number of governments worldwide that are legislating emissions reduction targets and policy measures to deliver them is rapidly growing each year, and it is time that Alberta joined them. This province — home to some of the world's foremost experts on carbon capture technology, methane reduction techniques, wind and solar power, and so many other clean energy solutions — has much to offer to the energy transition, and much to gain. The International Energy Agency, for example, estimates 14 million new energy jobs and 16 million new jobs in energy efficiency will be created, worldwide, between now and 2050.¹

To take advantage of these opportunities, Alberta must also be willing to confront the realities of the global shift towards low-carbon energy sources, and take steps to adapt and futureproof its economy and workforce. The global outlook for fossil fuels, for example, has fundamentally shifted in the last twelve months. In 2022, for the first time, a range of assessments — including from within the oil industry — projected that the current level of worldwide policy momentum on emissions reductions will result in a sustained decline in global demand for oil,² beginning this decade. If the world successfully achieves its goal of reaching net-zero emissions by 2050 and avoiding the worst effects of climate change, that demand decline will begin sooner and be steeper — and will have a significant impact on Alberta's industry.

Acknowledging these realities, and choosing to show leadership on climate and energy policy, is integral to Alberta's overall attractiveness as an investment destination. Now more than ever before, companies are looking for opportunities to invest in climate solutions, and for jurisdictions where they can operate while meeting their own climate goals. Choosing instead to remain out of step with the global trend towards low-emission economies would leave Alberta at a significant disadvantage in the years ahead.

The Pembina Institute is, and has always been, proudly headquartered in Alberta; this is our home. We are committed to seeking out effective, evidence-based policy solutions that can support this province's communities, economy, and environment.

As the 2023 provincial election approaches, this document provides our recommendations to future leaders in Alberta to advance this province's position in the transition towards low-carbon energy. Above all, we think Alberta can and should be a leader on climate and the energy transformation in Canada.

According to latest annual figures Alberta is the **largest provincial contributor** to Canada's total emissions: 256 out of 672 megatonnes, or **38.2%**.³



The largest source of emissions in Alberta is **oil and gas** (51.8%), followed by **electricity** production (11.4%) and **transportation** (10.9%).



Quick facts

Electricity emissions in Alberta are falling due to the **phase-out of coal power** that is expected to be completed in 2023 — **seven years ahead of schedule**.⁴



Since 2005, **oil and gas** and **transportation emissions** increased by **26.1%** and **21.4%** respectively.



Alberta now leads Canada on new installations of **renewable energy**.

Despite progress on many key sectors, Alberta still has a long way to go:

- Unlike many of the jurisdictions Alberta is competing with for capital investments, the province has yet to commit to achieving net-zero emissions by 2050. This is important for attracting sectors with direct links to the energy transition, such as clean energy developers, as well as others that increasingly have sustainability targets, such as technology companies.
- The oil produced in Alberta remains amongst the most emissions intensive in the world, largely due to the nature of oilsands production. While modest reductions in emissions intensity have been achieved, there remain important measures — such as methane reduction — that companies could undertake now to further reduce emissions from their upstream operations.
- Most electricity generation in the province currently comes from natural gas, although there has been a notable recent uptick in investment in wind and solar. Despite the availability of these cleaner, cheaper renewable options, new sources of gas-fired generation continue to be approved. This risks locking the province in to a high-emitting form of electricity generation for decades to come, and potentially burdening Albertans with the volatile commodity prices of gas and the high costs of stranded gas assets that will be incompatible with Canada's broader commitment to a fully net-zero electricity grid by 2035.
- 54% of Albertans say they would like their next vehicle to be electric. However, due to a lack of supportive policies, adoption of electric vehicles is slower in Alberta than much of the rest of Canada. In Q1 2022, EVs made up just 3.1% of new vehicle registrations in Alberta — much less than the 17.1% in British Columbia, 13.6% in Quebec, and 5.7% in Ontario.⁵

Perspectives on climate and energy have shifted

Since the last provincial election, many of the world’s largest corporations have set short-term emissions reduction targets, and committed to achieving net-zero emissions by 2050 and to aligning their business operations with a carbon-constrained economy. This has been driven by a significant growth in the last few years in environmental, social and governance (ESG) considerations within the investment community. For example, in August 2022, McKinsey reported that more than 90% of S&P 500 companies publish ESG reports in some form, and that investments into sustainable funds had grown exponentially in the last five years.⁶

This shift has filtered through to Alberta, where industry leaders have also changed their views on the province’s role in the energy transition. Major energy companies including Capital Power, Enmax, Suncor, Enbridge, Cenovus, CNRL, ConocoPhillips, Imperial, TransAlta and MEG Energy have set net-zero targets for 2050 or earlier. This indicates that, regardless of the legislation or regulations currently in place to drive emissions reductions, business leaders are recognizing

that doing so is existential to the financial viability of their business models.

To capitalize on this private sector momentum, clear provincial policies and targets are now needed to shore up certainty in the investment environment, and further encourage companies’ emissions reduction projects to move ahead. The Government of Alberta should urgently legislate provincial climate targets, as a first step in working with industry in achieving their commitments. Policymakers should also prioritize the creation of sector-specific emissions reduction policies and regulations that acknowledge the need for an all-hands-on-deck approach across the province.

Albertans themselves also appear to be aware that a proactive approach to emissions reductions across sectors is the path to future health and prosperity of this province. Polling data from November 2022 by Janet Brown Opinion Research shows that a majority of Albertans think more should be done to address climate change, and that the transition away from oil and gas will be beneficial in the long run (Figure 1).

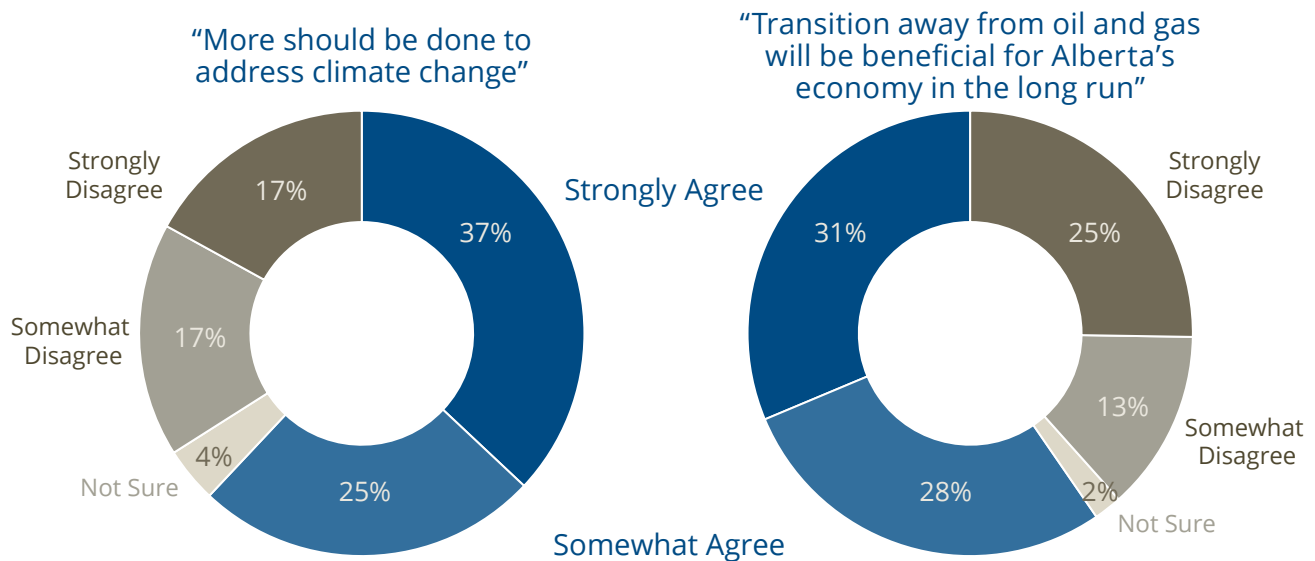


Figure 1. Albertan perspectives on environmental issues

Data source: Janet Brown Opinion Research⁷

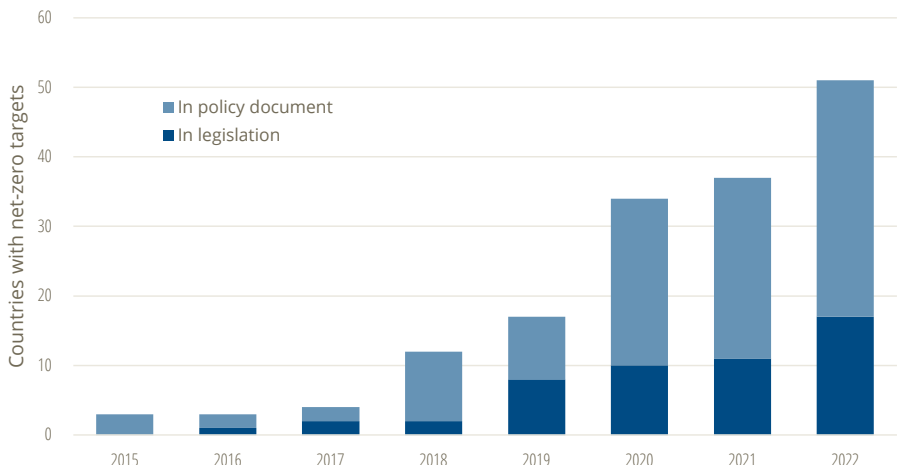
The world is responding — now Alberta must too

Across the world, momentum on climate and energy solutions is continuing to build with every passing year. Jurisdictions across Canada and internationally are taking action to achieve net-zero economies and embrace the possibilities of the energy transition.

- Most Canadian provinces have set emissions reduction targets and strategies to achieve them, including British Columbia, Manitoba, Ontario, Quebec, Nova Scotia, and New Brunswick. **With no formal emissions reduction target, Alberta is an outlier.**
- In March 2022, the federal government released its 2030 Emissions Reduction Plan, which outlines an **economy-wide pathway to reducing Canada’s emissions by at least 40% below 2005 levels by 2030**. This is a crucial milestone on the way to achieving net-zero emissions by 2050, but will require support from all provinces — particularly Alberta, given its considerable emissions profile — to move forward successfully.
- Edmonton and Calgary, **Alberta’s largest municipalities, have both developed comprehensive climate strategies** to achieve net-zero economies by 2050. These include decarbonizing city operations, setting carbon budgets, and investing in low-carbon technologies.
- China, the largest global emitter, is **on track to meet its goal of ensuring emissions peak before 2030**, and then begin to decline.
- The United States, the second-largest global emitter, in summer 2022 introduced its **historic Inflation Reduction Act**, which commits US\$369 billion over the next ten years to climate measures and clean energy development.⁸
- **68 carbon pricing initiatives** have been implemented across the world — including in Canada — covering 23% of global emissions in 2022.
- The **Global Methane Pledge**, signed by over 150 countries as of November 2022, aims to reduce global methane emissions by at least 30% from 2020 levels by 2030. Canada has pledged to reduce oil and gas methane emissions 75% from 2012 levels by 2030, and in November 2022 the federal government introduced a comprehensive new proposed regulatory framework on oil and gas methane.
- **The number of countries with an announced or legislated net-zero target is growing rapidly**, up from just 12 in 2018 to 51 in 2022 (Figure 2).
- Several major developed economies have agreed to **decarbonize their respective electricity generating sectors by 2035**.

Figure 2. National net-zero targets announced and in legislation

Data source: Net Zero Tracker⁹



Alberta has not made effective progress on reducing total emissions

As noted above, Alberta remains the largest single provincial contributor to Canadian emissions. This is in part due to its large oil and gas industry (which emits 132.8 megatonnes (Mt) per year), a relatively carbon

intensive electricity system (29.3 Mt), as well as a lack of specific policies and incentives to reduce emissions in sectors such as transportation (28.1 Mt), buildings (20.7 Mt), and agriculture (19.4 Mt) (Figure 3).

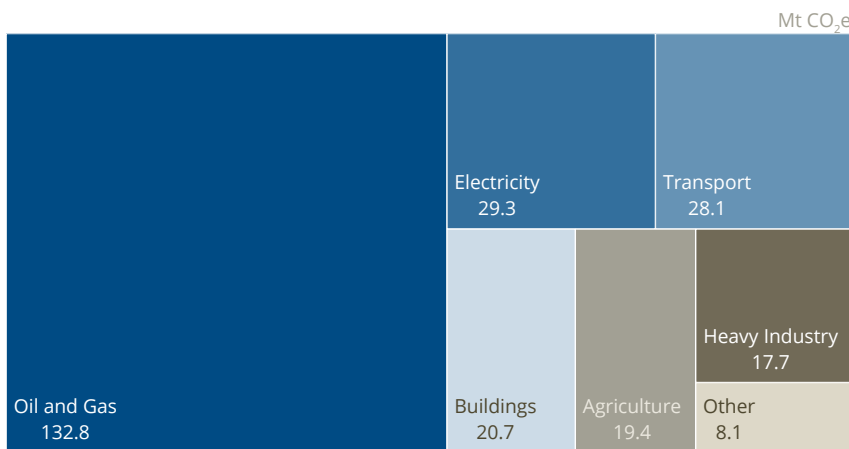


Figure 3. Sectoral contribution to emissions in Alberta, 2020

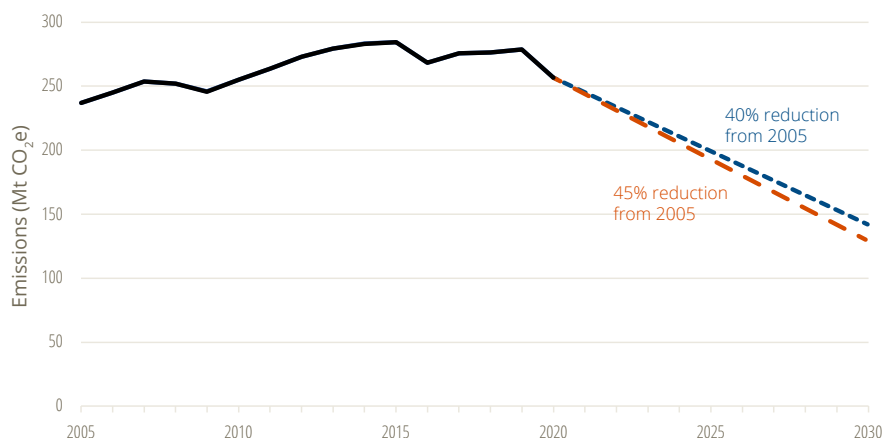
Data source: Environment and Climate Change Canada¹⁰

Since 2005, **emissions in Alberta have increased** by a further 8%. Annual emissions would need to decrease by between 11.4 Mt and 12.5 Mt per year from 2020

(the latest year that data is available) to achieve a proportional share of reductions equivalent to Canada’s international target (Figure 4).

Figure 4. Total emissions in Alberta from 2005, with trajectories for 40-45% emissions reduction below 2005 levels by 2030

Data source: Environment and Climate Change Canada¹¹



Progress is possible

While Alberta must take urgent and decisive action to change its emissions trajectory, there is evidence that this province can make significant progress, and do so quickly, when policy measures are well-designed and implemented.

Defying expectations on the coal phase-out

It is expected that the last coal-fired electricity power station in Alberta will go offline in 2023 (Figure 5). This represents huge progress for Alberta, and means **coal will be phased out some forty years earlier than the target date** that had been in place at the beginning of 2012.

Indeed, when plans for a faster coal phase-out were introduced later in 2015, the target set was 2030. At the time, this provoked loud argument around feasibility from some corners. However, we have since witnessed that a combination of policy certainty (2030 coal

phase-out target, and sector-wide carbon pricing), and economics (coal’s poor competitive positioning against cheaper, cleaner alternatives), combined with growing corporate momentum on emissions reductions, have cut even that accelerated timeline in half. **The coal phase-out demonstrates the huge amount that Alberta can achieve when politicians, policymakers and the private sector come together effectively.**

Not only is this resulting in significant emissions reductions in Alberta’s electricity sector, but it also contributes to a cleaner environment. Albertans will soon benefit from air that is largely free of harmful pollutants associated with coal.

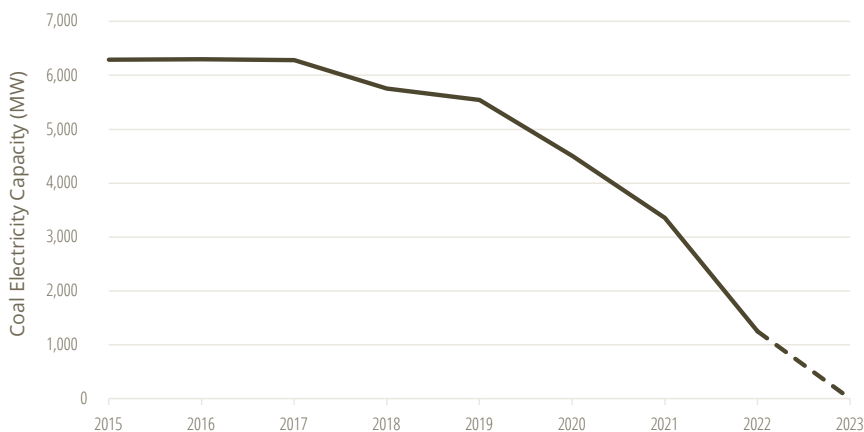


Figure 5. Installed capacity of coal in Alberta since 2015

Data sources: AESO, Capital Power¹²

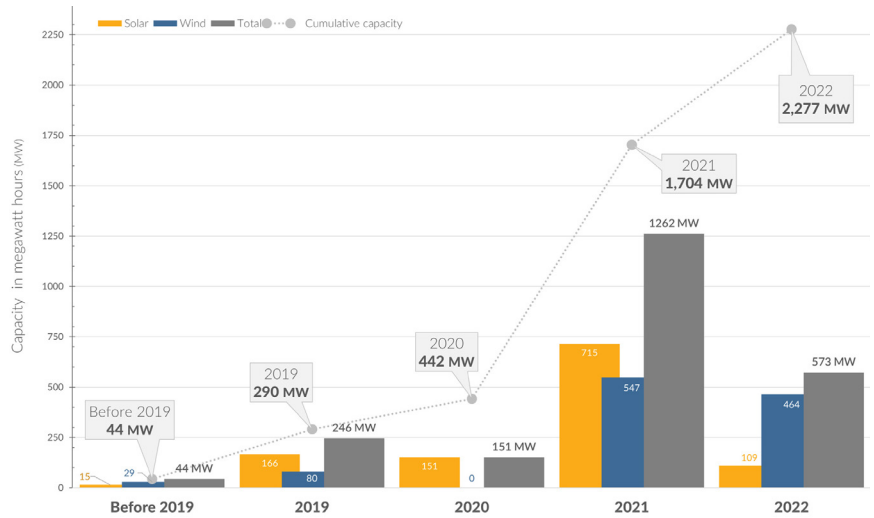
Leading on renewable energy

Corporations in Alberta are also investing heavily in clean electricity. Over the past several years, Alberta has led Canada in installations of wind and solar, driven by corporate investment, enabled by the low cost of renewables and the province’s deregulated market.

Renewable energy purchasing deals signed to-date are supporting the development and construction of over **\$3.75 billion worth of new wind and solar energy investment** in Alberta, creating **nearly 4,500 jobs** (Figure 6).¹³ The energy provided is now **enough to power over 640,000 homes** — more than all the homes in Calgary, Lethbridge, Medicine Hat, and Red Deer combined.

Figure 6. Corporate renewable energy deals in Canada to 2022

Source: Business Renewables Centre Canada¹⁴

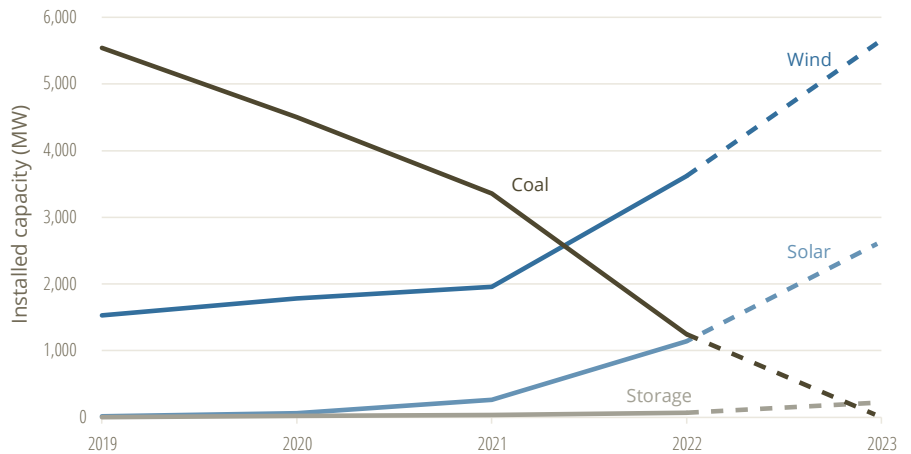


Alberta’s leadership on the development and corporate procurement of renewable energy is just one glimmer of the potential for the new energy future in this province. In the past, the concept of Alberta energy has tended to be solely linked to our abundant fossil fuel resources — but there is no reason to believe that in the near future,

Alberta energy should not also mean clean, renewable power, derived from our hours of sunlight and wind, and facilitated by an electricity market that allows companies to purchase relatively cheap renewable electricity directly from suppliers.

Figure 7. Installed capacity of selected generation technologies in Alberta

Data source: AESO, Capital Power¹⁵



Strengthening industrial carbon pricing

In 2007 Alberta was the first province to implement an industrial carbon pricing system, which has since been through several iterations and updates.

In December 2022, the province strengthened the existing Technology Innovation and Emissions Reduction Regulation (TIER). The price per tonne of carbon emitted is now guaranteed to increase in \$15 increments, reaching \$170/tonne by 2030. In addition,

the stringency of TIER has been improved, particularly for oilsands facilities — which provides crucial certainty for investments in decarbonization projects in that sector.

While there remains scope for further strengthening, the Pembina Institute welcomes these changes, which will provide incentives for industry to further reduce emissions while also protecting competitiveness.

Get back to doing what Alberta does best

As outlined above, a convergence of changing public and industry attitudes on the need to reduce emissions, along with the scale and pace of technological development, has created the conditions for Alberta to acknowledge the energy transition and begin to embrace the benefits it has to offer.

It is worth remembering that Alberta has done this before. More than 40 years ago, this province undertook a major investigation into how to kick-start a strong energy sector. In the face of oil price shocks, rapidly growing global energy demand and American determination to increase energy independence, then-premier Peter Lougheed saw what a thriving oilsands industry could do for Alberta.

In 1974, the Alberta Oil Sands Technology and Research Authority (AOSTRA) was established to accelerate innovation and deployment of novel technologies for the energy sector. Over the course of its lifetime, AOSTRA spent \$448 million on public-private partnerships that were instrumental in developing in-situ extraction technologies, including the now dominant steam-assisted gravity drainage (SAGD) technology that made oilsands development

commercially viable. As such, the success of the oilsands industry is a product of a clear government vision and plan for the energy sector, backed up with government-funded technology breakthroughs.

Today, Alberta needs a new industrial policy: one that similarly focuses on accelerating the adoption and deployment of new technologies, but also acknowledges the realities of a rapidly decarbonizing world. As a result of historically high resource revenues, the province is well-placed to make big strategic investments in industries that have room to grow in a net-zero world and in which the province has a comparative advantage.

To deliver this, Alberta needs **an immediate, sustained and coordinated decarbonization strategy** that involves ministries responsible for oil and gas, electricity, transportation, housing, economic development, environment, labour, training, and skills development. Such a plan will provide policy coordination and clarity on the province's pathway to net-zero emissions, so that government, businesses and individuals understand what needs to happen, and who will be involved.

A sustained and coordinated decarbonization strategy for Alberta should:

- Formally commit Alberta to **reducing emissions by 40-45% from 2005 levels by 2030, and to net-zero emissions by 2050** (in line with Canada's internationally recognised targets).
- Include **five-year sectoral targets** that are aligned with the above commitment.
- Focus on the highest-emitting sectors first: **oil and gas, electricity, and transportation**.
- Demonstrate an intention to **work towards these goals alongside other governments**, including at the federal, provincial, and municipal level, as well as Indigenous peoples.
- Support policies that create **good-quality jobs and an equitable future for all workers and communities**.

The following pages further outline the Pembina Institute's suggestions for areas of focus for policymakers designing the trajectory of Alberta's climate and energy strategy over the next several years.



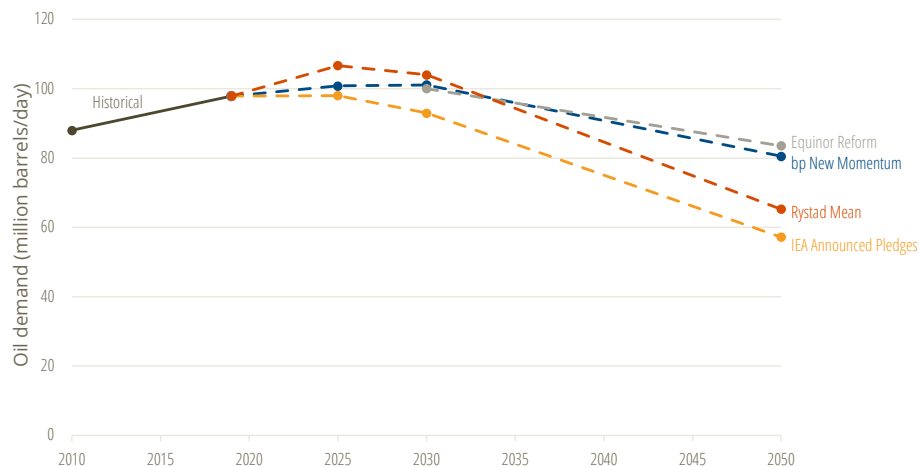
Futureproof the oil and gas sector

Alberta’s oil and gas sector is facing a tightened global market in the next few years. Several institutions, including modellers such as the International Energy Agency, Bloomberg, and Rystad — as well as oil

companies such as bp and Equinor — project that global oil demand will enter into long-term decline before the end of this decade, even if no further climate policies are adopted (Figure 8).

Figure 8. Oil demand under current policy and economic trajectories (evolving policy scenarios)

Data source: various¹⁶



If the world reaches its goal of net-zero by 2050 (a target which some 188 countries have now either enshrined in legislation, developed commitments on, or declared

an intention to work towards), that demand decline is projected to happen faster and be steeper.¹⁷ (Figure 9)

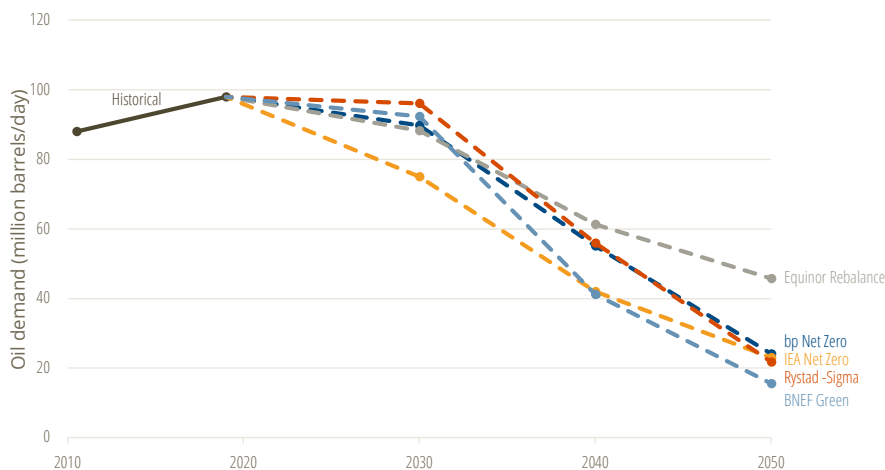


Figure 9. Oil demand if countries reach net-zero by 2050, or global warming is limited to 2 degrees Celsius

Data source: various¹⁸



There will still be demand for oil in 2030 and 2050, but as the world rapidly decarbonizes, it is reasonable to expect that both the **cost and the carbon intensity** of a barrel of oil will become critical factors in its competitiveness. It is therefore crucial that the sector — Alberta's largest industry — takes rapid action to decarbonize its operations.

The first step in this is recognizing the current carbon intensity of Canada's oil and gas sector. In 2020, the oilsands produced nearly half of Alberta's total emissions.¹⁹ And while companies have achieved some modest reductions in emissions intensity in recent years, these reductions have been more than offset by increasing output, meaning total sectoral emissions continue to rise (Figure 10).

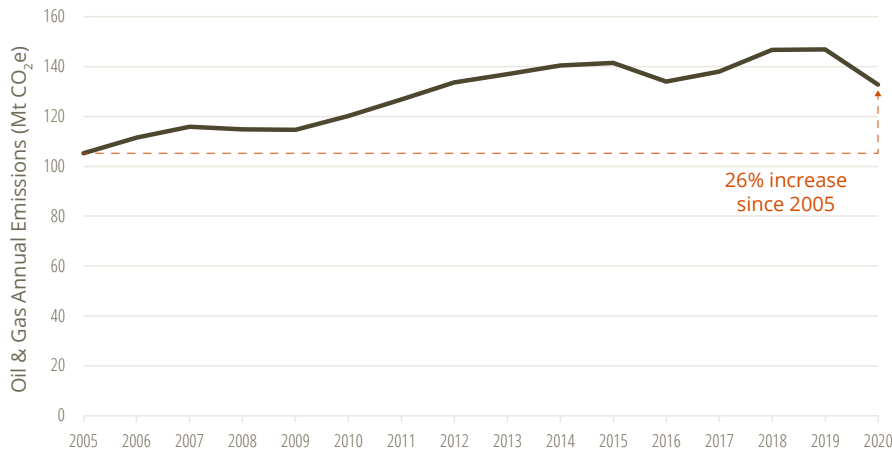


Figure 10. Oil and gas emissions in Alberta 2005-2020 (latest available data)

Data source: Environment and Climate Change Canada²⁰

While several companies, particularly in the oilsands, have now committed to cutting emissions from their upstream operations, we have yet to see progress on emissions reduction projects that would deliver those goals.²¹ Those projects could include large multi-year investments in carbon capture and storage technology (which was pioneered in this province), but also include a range of immediate, relatively low-cost actions that could be taken, such as methane abatement, electrification of industrial processes, and deploying solvents in the oilsands.

Leaders in Alberta must be ready to confront these realities, implement policies, strengthen regulations, and hold companies accountable to their own commitments — to ensure Alberta's largest industry remains competitive in a low-carbon global economy.





RECOMMENDATIONS

Further strengthen Alberta's industrial carbon pricing system over time

The Pembina Institute welcomes the Government of Alberta's recent strengthening of the Technology Innovation and Emissions Reduction Regulation (TIER), particularly the confirmation that the price of a tonne of carbon emitted will increase to \$170 by 2030. We also welcome other changes to TIER that will ensure free emissions will be phased out for oilsands facilities, at a rate that is aligned with Canada's 2050 net-zero target. This will provide increased certainty to investors in industrial decarbonization projects in Alberta that credit prices will not crash and they will see reliable returns on their investments.

However, to be effective, TIER must be further strengthened to incentivize investment in projects that will result in faster and deeper emissions cuts across all large industrial emitters.²²



Photo: Pembina Institute

Implement a strengthened provincial cap on oil and gas emissions

Alberta already has established the Oil Sands Emissions Limit Act which provides a mechanism to cap and reduce oilsands emissions. It was always envisioned that this cap would decline over time in order to meet future Government of Alberta objectives to reduce emissions. Introducing an economy-wide cap-and-trade system, or further strengthening TIER to lower the cap and reduce emissions to ensure the sector does its fair share in meeting Canada's climate targets, would allow Alberta to regulate oil and gas emissions itself, rather than choosing to delegate responsibility to reduce absolute oil and gas emissions to the federal government.



Photo: Pembina Institute



RECOMMENDATIONS



Photo: Pembina Institute

Address methane emissions

Methane abatement is amongst the cheapest, most easily implemented options for emissions reductions in the oil and gas sector. Our research, based in Alberta, demonstrates that strong regulations can result in drastically lowered emissions, without negatively impacting levels of oil and gas production.²³ We therefore recommend that Alberta set a provincial target to reduce methane emissions by at least 75% by 2030, and concurrently strengthen regulations to achieve that. In doing so, Alberta can build on its leadership on methane, which has created a whole ecosystem of methane technology companies and world-leading specialists in the province. According to the Methane Emission Leadership Alliance, a grouping of Canada's leading methane-reduction practitioners, there are more than 170 Canadian companies providing methane-emissions management solutions right now — 80% of which say they expect jobs to grow as a result of methane regulations.

Advance Alberta's hydrogen strategy

The Pembina Institute sees low- and zero-carbon hydrogen as being able to play a role in decarbonizing Canada's energy systems. For Alberta's hydrogen to be competitive on a global scale, it will have to achieve the lowest carbon intensity possible. While hydrogen has potential applications in many sectors, its greatest value may lie in its potential to reduce carbon pollution from hard-to-decarbonize sectors and end-uses, such as steel production and other high-heat industrial processes.

Take action on oil and gas liabilities

While the oil and gas sector is required to fully reclaim lands after operations are complete, Alberta has a major and growing problem with unfunded liabilities from both conventional oil and gas and oilsands. Due to weak enforcement of rules, the Alberta Energy Regulator reports an inventory of more than 170,000 inactive and abandoned wells. Some assessments of the total cost of reclaiming sites in both the oilsands and Alberta's conventional oil and gas industry could total \$58-260 billion.²⁴

The Government of Alberta should commit to transparently improve the Mine Financial Security Program to ensure that taxpayers do not bear the risk for unfunded oilsands tailings management and land reclamation, and direct the Alberta Energy Regulator to accelerate and enforce reclamation of the large inventory of inactive and abandoned wells across the province.

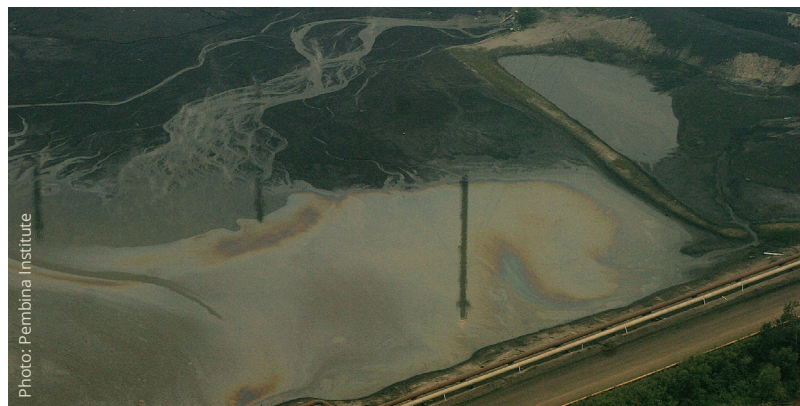


Photo: Pembina Institute



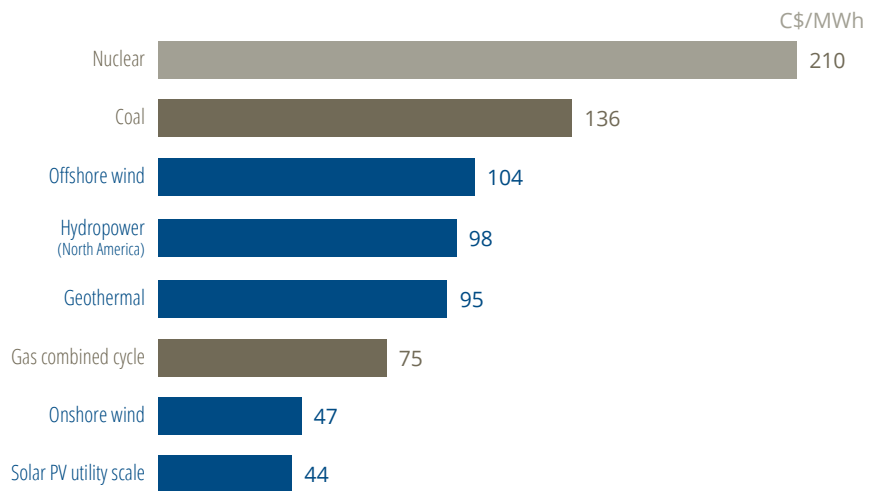
Modernize, decarbonize, and upgrade Alberta's electricity grid

Creating a clean electricity grid will provide environmental, social and economic benefits for Alberta and Albertans. It is also an opportunity to modernize the system, which will improve the resilience of Alberta's electricity supply. Diversifying the generation

mix, investing in energy efficiency, and enabling demand-side management will result in electricity being provided where and when it is needed, at an affordable cost to Albertans — given the low and still falling cost of clean energy solutions (Figure 11).

Figure 11. Global levelized cost of energy for various generation options

Data sources: Lazard, IRENA²⁵



A clean grid (Figure 12) will also underpin Alberta's future clean economy — which will increasingly need to be electrified. It will facilitate emissions reductions in other sectors that rely on it, such as buildings,

transportation, and heavy industry. In doing so, Alberta will provide businesses with certainty that by choosing this province as their location of operations, they will be able to meet their own corporate net-zero targets.

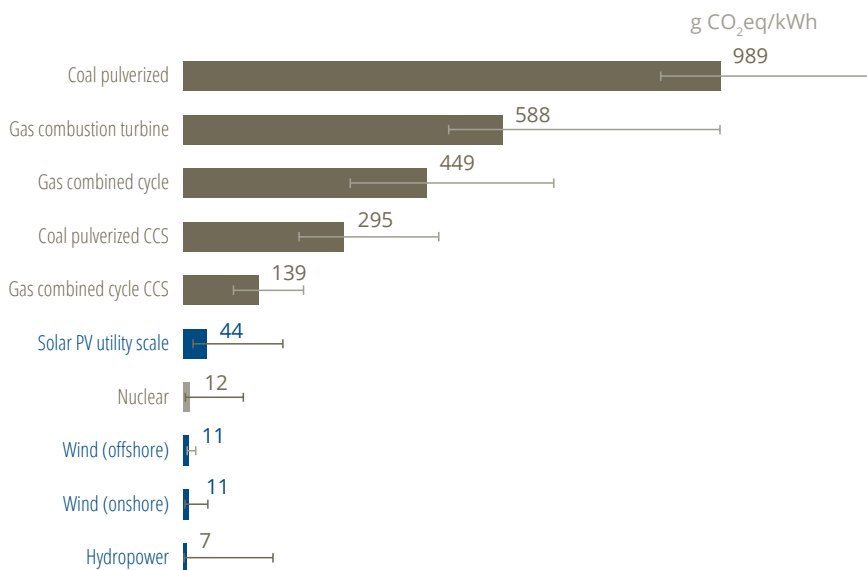


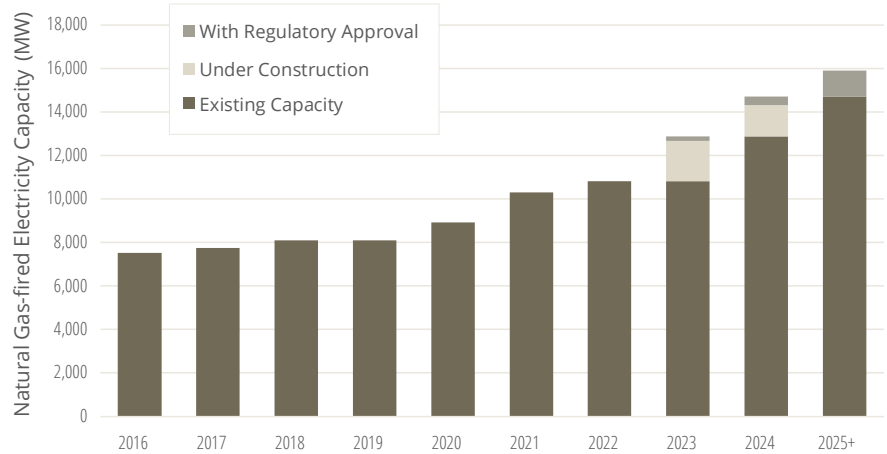
Figure 12. Global average life-cycle GHG emissions by generation type

Data source: UNECE²⁶



Figure 13. Total installed and planned capacity of natural gas-fired electricity generation in Alberta

Data sources: CER, AESO²⁷



On this, Alberta is off to a good start. As mentioned earlier, it has led Canada in installations of wind and solar over the last few years, driven by private sector investment in Alberta’s deregulated market. Additionally, the province is on track to fully retire coal as a source of electricity in 2023, some forty years ahead of the schedule that was in place at in 2012.

However, Figure 13 demonstrates that while installed coal capacity in Alberta is declining rapidly, emitting natural gas generation is growing dramatically — undermining the achievements of the coal phase-out.

In the next two years, an additional 3886 MW of new gas capacity is set to be added to the Alberta grid. If this happens, Alberta will continue to have one of the most emissions-intensive grids in the country.

These gas power stations would also be at risk of becoming stranded assets, either due to lack of cost-competitiveness, or because they will not be compatible with forthcoming federal regulations aimed at achieving a nationwide net-zero electricity grid by 2035. A grid dominated by gas also exposes Albertans further to volatile gas prices.

Fast, decisive action is required to mitigate against this risk of gas lock-in in Alberta, and instead spur large-scale investment in clean grid technologies. In the context of the above, there should be particularly careful consideration paid to new investments and approvals of unabated gas-fired power stations in Alberta.



Photo: Green Energy Futures



RECOMMENDATIONS

Commit to a net-zero grid by 2035

This would bring Alberta in line with Canada's nationwide commitment to the same — which itself is aligned with clean grid commitments from peer economies such as the U.S. and U.K. Setting a clear target will not only make Alberta more attractive to companies with sustainability goals, but will also send an important early signal to generators and utilities in the province about investments today that will affect the grid of 2035 and beyond.²⁸ It will also provide an opportunity for the province to create a made-in-Alberta plan that addresses the unique features and challenges of our electricity grid.



Photo: Pembina Institute

Attract investment in transmission infrastructure and energy storage

When renewable electricity generation is paired with transmission infrastructure (both within Alberta and between provinces) and energy storage, this provides affordable, reliable electricity. There is an opportunity for Alberta to leverage significant federal funding to support the build-out of these solutions and reduce costs to Albertans.

In addition, using transmission infrastructure to connect Alberta to neighbouring grids will allow it to bring in low-cost energy from other provinces when available, and export the electricity it generates when there is excess. Such balancing of the grid across borders helps the development of cheap renewables, while reducing costs to ratepayers.²⁹

Similarly, as the costs of energy storage decline rapidly, the province must encourage the development and integration of significant amounts of storage in the grid. This will also help reduce electricity costs, while increasing grid reliability.³⁰ There are opportunities to leverage funding from the federal government for such investments.

Update electricity regulations to support innovation, grid modernization, and emissions reduction

The current provincial electricity regulations need to be updated to enable innovation by the electricity utilities so that they can meet the growing interest among their customers for distributed energy solutions (such as rooftop solar, efficiency measures, and demand-side management).³¹ In addition, the mandate of the electricity regulator (the Alberta Utilities Commission) needs to be expanded to include climate imperatives, so that it can make decisions that optimize emissions reductions while maintaining affordability and reliability.

Support community energy development

Alberta municipalities are keen to invest in clean energy and benefit from the revenue generation and business development that it creates. The province can unlock this significant economic diversification potential for municipalities by creating a community energy program, providing support to address the barriers to investment, and enabling municipalities to work together to aggregate their demand for clean energy and clean energy projects.



Help all Albertans benefit from clean, reliable, affordable transportation

Adoption of electric vehicles (EVs) around the world is on a rapid upwards trajectory. Sales of electric vehicles increased globally and in Canada during the pandemic,

and are keeping pace with International Energy Agency projections of what is needed to reach a net-zero transportation sector by 2050 (Figure 14).

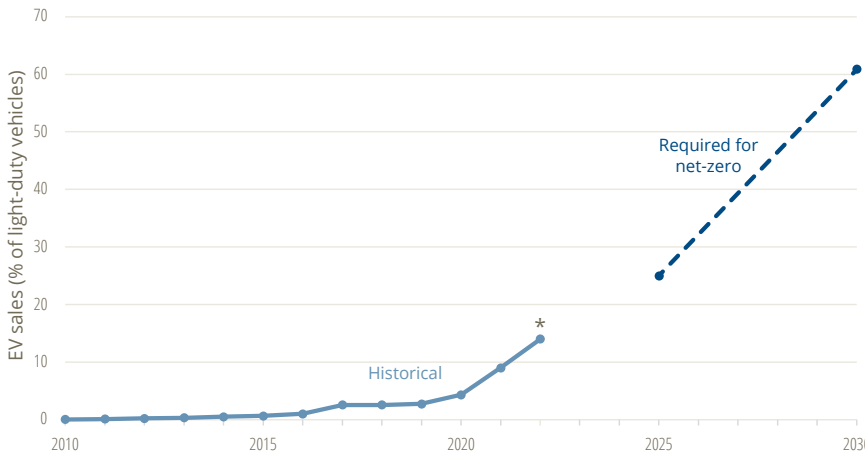


Figure 14. Share of global light EV sales needed by 2030 on the road to net-zero

* Projected value

Data sources: Hastings-Simon, IEA³²

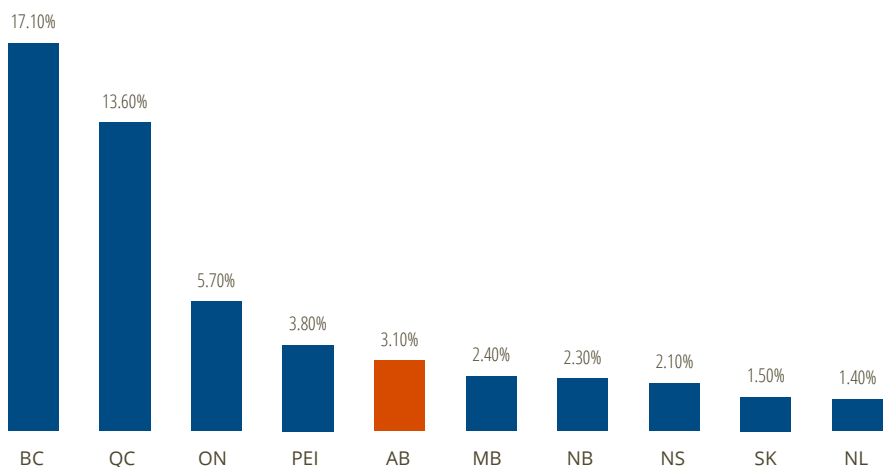
In Canada, the increase in EV adoption has been led by B.C., Ontario, and Quebec. In 2021, almost 43% of new zero-emissions vehicles registered in Canada were in Quebec. B.C. and Quebec are also the only two provinces with provincial sales mandates for passenger/light-duty EVs — 90% of sales by 2030 in B.C. and 65% by 2030 in Quebec. In addition, the federal government,

six provinces and two territories have purchasing incentives for zero-emission passenger vehicles.

Albertans, by comparison, are not being given an equal opportunity to participate in the EV revolution. A lack of policy incentives in the province means EV availability and sales here remain relatively low (Figure 15).

Figure 15. Zero-emission vehicle share of new vehicle registrations by province, Q1 2022

Data source: IHS Markit³³



The benefits of clean transportation go beyond supporting our climate imperatives. For example, EVs offer consumers the opportunity to end their reliance on unpredictable gasoline prices, and, while still more expensive to purchase than combustion vehicles, EVs are already cheaper than conventional vehicles on a total cost of ownership basis.⁵⁴ The upfront cost is expected to decrease as vehicle manufacturers invest more in development to meet forecasted demand. Bloomberg New Energy Finance estimates that electric

vehicles may be cheaper to buy than combustion vehicles as early as 2026 in most countries.⁵⁵

Moving towards clean transportation solutions also results in better air quality, and more pleasant environments for Albertans to live and work in. But, given the scale of uptake globally, Alberta must move quickly if it intends to capitalize on this rapid shift to low-emissions transport and all the associated societal benefits.

Transportation

RECOMMENDATIONS



Support non-emitting transportation for every Albertan

Alberta should adopt a percentage-based zero-emissions vehicle (ZEV) sales requirement for personal vehicles, with the goal of achieving 60% of new passenger car and light truck sales by 2030, and 100% by 2035. This will help improve access for Albertans wanting to purchase electric vehicles, given that manufacturers prioritize availability of EVs to provinces with sales mandates. The province should also commit to electrifying publicly owned fleets, especially public transit and school buses.

In addition, a time-limited financial incentive program should be introduced to reduce the difference in purchase price between EVs and comparable internal combustion engine vehicles, while also supporting the purchase of private EV chargers for homes, workplaces, and fleets. Priority should be given to increase EV accessibility to lower-income households and small- and medium-sized enterprises.

Finally, Alberta should continue to invest in public charging stations, including Level 2 chargers and DC fast chargers. Recognising that many Albertans do not live in single-family homes, regulations should be updated to require EV-ready parking and charging in all new multi-unit residential buildings. Financial



incentives to encourage EV-ready retrofits of multi-unit buildings should also be introduced.

Invest in cities and active transportation

Investing in public transit within and between urban and rural and remote communities will make it easier to get around without a car. In addition, improving access to active transportation — such as by building bike lanes and creating walkable cities — will improve Albertans' experience of their urban environments.



Invest in the homes and buildings of the future



Photo: Pembina Institute

The global energy crisis and resultant volatility of global fossil fuel prices has made energy affordability a top-of-mind issue for Albertans. Investing in energy efficient building design, switching to cheaper, cleaner fuels for home heating (such as heat pumps), and

implementing energy conservation strategies will not only reduce emissions, but also insulate Albertans from rising heating costs, futureproof our communities against extreme weather events, and ensure our indoor spaces are healthy and safe.

Buildings contribute as much as 65% of local emissions, and cities need support to meet their climate targets.³⁶ With the federal government developing the Canada Green Buildings Strategy, Alberta has an opportunity to grow local construction and manufacturing capacity and provide thousands of good, sustainable jobs for Albertans (Table 1).

By our estimate, an annual \$2.5 billion public investment in the buildings sector will return an estimated \$5.8 billion/year in GDP to Albertans (Table 1). In addition, upgrades to insulation and switching to high-efficiency cold climate heat pumps will drive emissions down by 70% while keeping energy bills low (Table 2).

Table 1. Economic growth and job creation for residential and commercial retrofits

Retrofit building type	Total investment (\$ billion/year)	Gross GDP growth (\$ billion/year)	Gross jobs per year
Residential	\$1.6	\$3.7	15,200
Commercial	\$0.9	\$2.1	8,800
TOTAL	\$2.5	\$5.8	24,000

Table 2. Economic and carbon impacts of the renovation wave in the residential sector

Retrofit building type	# of buildings retrofitted per year	Carbon reductions (% below 2017 by 2050)	Energy bill savings in 2050
Detached homes	42,800	70%	\$200 million/year
Attached homes	7,600		
Apartments	13,100		

Data source: Pembina Institute⁴²



RECOMMENDATIONS

Adopt all performance tiers in the national model building codes

Alberta's construction industry has already shown its capacity to adopt cutting-edge construction techniques, through which it has demonstrated the feasibility and benefits of highly efficient designs and retrofits in cold climates. For example, the province is already home to passive house-certified homes and buildings (a design standard that achieves thermal comfort with minimal heating and cooling, by using things such as insulation, appropriate window and door design, and ventilation systems with heat recovery).³⁷

By adopting all performance tiers defined in the 2020 National Building Code and National Energy Code for Buildings, Alberta would allow leading municipalities to raise the bar in regions where industry is already demonstrating its leadership, while allowing other local governments to keep pace with the provincial minimum. Setting a schedule for adoption of upper-level tiers would give industry a line of sight on coming performance targets. Communities can currently tap into the new Codes Acceleration Fund to help industry build the skills and capacity they need to be able to deliver higher-quality homes and buildings for Albertans.³⁸

Improve the efficiency of heating equipment

Canada is updating its Energy Efficiency Act to help harmonize equipment standards and drive emissions reductions. Energy-using products are already regulated in most Canadian provinces (British Columbia, Manitoba, Ontario, Québec, New Brunswick and Nova Scotia).³⁹ Alberta could bring back its Energy Efficiency Act with a mandate similar to its counterparts in other provinces, to drive efficiency of building components, equipment and appliances and to phase out heating equipment that is less than 100% efficient.

Help utilities modernize to meet the needs of Albertans

Canada's path to net-zero emissions will require utilities to adapt. According to our calculations,



electric heating systems will be able to heat Alberta's homes and buildings at a lower carbon footprint than a high-performance natural gas furnace as early as 2023.⁴⁰ Utilities can support this transition while keeping ratepayer costs low through strategic rate structures and demand-side management programs, and aligning their business models with net-zero emission targets.

Maximize the benefits for Albertans

Several federal and local government supports and programs on buildings are already available to Albertans. By harmonizing with these, and topping them up, Alberta can drive further innovation in the sector while stimulating economic development and job growth. As indicated in Table 1, a \$2.5-billion annual investment in deep retrofits by the provincial and federal governments and utilities would stimulate \$5.8 billion in GDP and 24,000 good full-time jobs.

Albertans now have access to up to \$40,000 in no-cost loans for home retrofits and up to \$5,000 in grants from the federal government. The City of Edmonton's Home Energy Retrofit Accelerator offers homeowners up to \$1,500 to make energy efficiency upgrades. To maximize benefits for Albertans, the province could provide matching funding and facilitate access by creating an online portal (like those hosted by Efficiency Manitoba or CleanBC) that centralizes information and helps home and building owners secure funds.



Safeguard nature by expanding conservation areas

Nature is in decline around the world, including in Alberta; this threatens to destabilize ecosystems and erode natural resource-based economies. Scaled-up land conservation action in partnership with all levels of government, Indigenous communities and civil society is urgently needed to tackle both climate change and biodiversity loss.

At the international nature conference COP15 in Montreal in December 2022, 196 countries reached a historic global deal for nature and people — including a commitment to protect 30% of their landscapes by 2030. But conserving land for nature in Alberta has stalled, with little progress in recent years and only 15.4% of Alberta’s landscape protected — far less than many other jurisdictions and despite nature being a key part of Alberta’s “brand”.⁴¹ Doing our share to protect landscapes and meeting global standards for nature protection supports Alberta’s goal of being seen as an ESG leader.

Establishment of new parks and recreation areas is highly popular among Albertans and also enhances opportunities for all types of recreational uses.



Conservation



RECOMMENDATIONS

Expand protected areas

Commit to expand Alberta’s parks and protected areas network to conserve 25% of Alberta’s landscapes for nature and recreation by 2025, and 30% by 2030. Alberta has numerous announced conservation areas that have not received legal protection that could be established quickly.

Complete land use planning

Complete land use planning for the five (out of seven) land use planning regions across Alberta where no plans exist to guide decision-making and support responsible development and conservation.

Protect caribou habitat

Complete range plans for threatened woodland caribou that protect undisturbed habitat, set maximum levels of disturbance, and mandate restoration of impacted areas.

Stop coal mine expansion

Prohibit new coal mines across the Eastern Slopes of the Rocky Mountains and cancel coal leases that were granted without consultation in these sensitive areas.

Contact us

A robust and credible set of policies on energy and climate in Alberta will allow this province to move into the new energy economy and seize the benefits for citizens and industry. The Pembina Institute advocates for a strong, science-based approach to **climate policy, environmental protection and energy development**. We are a **proudly independent and non-partisan charitable organization**, and welcome the opportunity for dialogue with all organizations interested in advancing these issues in the province.

For further information about any recommendations or research in this document, please contact [Simon Dyer](mailto:simond@pembina.org), (simond@pembina.org), Deputy Executive Director of the Pembina Institute.

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The Pembina Institute acknowledges that the work we steward and those we serve spans across many Nations. We respectfully acknowledge the space our organization is headquartered in, as, the traditional and ancestral territories of the Blackfoot Confederacy, comprised of the bands Siksika, Piikani, and Kainai, the Îyârhe Nakoda Nations, including the bands of Goodstoney, Chiniki, and Bearspaw, and the Tsuut'ina Dené. These Lands are also home to the Métis Nation of Alberta – Region 3 whose Peoples have deep relationships with the Land.

These acknowledgements are some of the beginning steps on a journey of several generations. We share them in the spirit of truth, justice, reconciliation, and to contribute to a more equitable and inclusive future for all of society.

