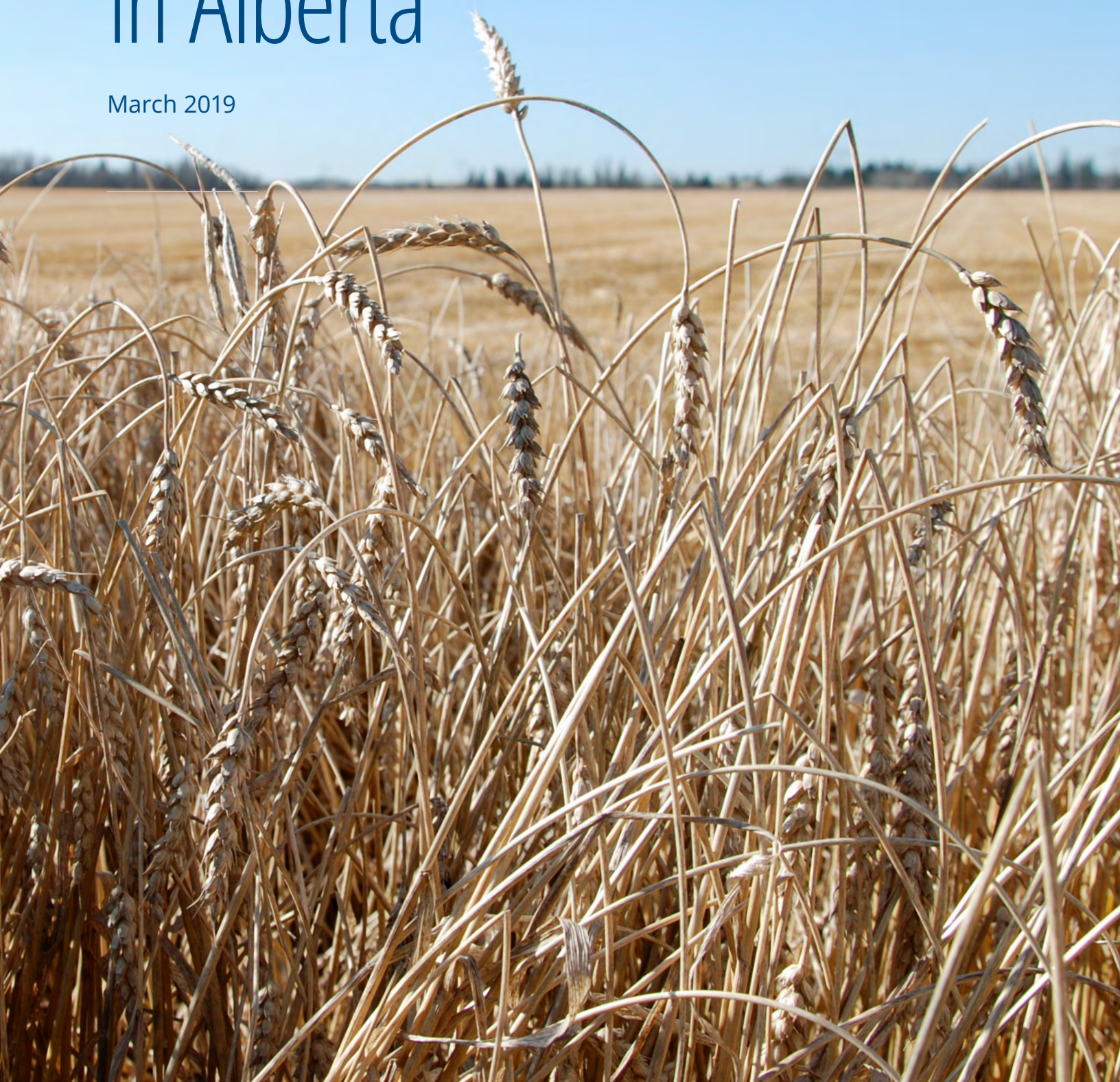


Energy policy leadership in Alberta

March 2019





Albertans have suffered through a substantial economic downturn. People inside and outside of the oil and gas industry have been struggling, and many Albertans feel our province hasn't been getting a fair deal. With that, a focus on what divides Albertans is overshadowing important issues. **The need to find common ground and better ways to talk with each — instead of at each other — is more important than ever. So, what do practical solutions for Albertans and our energy sector look like?**

People first

Alberta's policies must put the interests of the people first. Like most Albertans, we want to see the responsible development of oil and natural gas. The province's policy and regulatory environment must ensure that our resources are produced in a manner that is both economically and environmentally sustainable.

All Albertans have benefitted from the work of our oil and gas sector, and the high quality of life most of us enjoy because of it: warm homes in cold winters, hot water on demand, and convenient and affordable transportation to get to every corner of this province.

Alberta's energy future is complex

However, the global oil and gas sector is in the midst of profound change, something that has been acutely felt in Alberta. Our most reliable customer, the U.S., has become our most substantial competitor thanks to their dramatic increase in oil production. Meanwhile the economic fundamentals of the

business have been shifting, driven by the depletion of conventional reserves and the unforeseen productivity of unconventional reserves, as well as technological transformations underway in both the transportation and electricity markets.

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Oil and gas companies face challenges today that would have been unimaginable to the previous generation of industry leaders. Market access has become a central focus in Alberta for the last few years, so much so that it's sometimes treated as a stand-in for overall economic prosperity. Some think that if we could only increase market access, everything else would return to the "business-as-usual" scenarios of yesteryear.

But business-as-usual is not the road to continued prosperity

Market access is one important issue to discuss, but it's not the only discussion to have. There are several significant energy issues that will shape Alberta's economic future, and are already manifesting themselves today.

The demand for our traditional oil and gas products is no longer as predictable as it once was. Global markets will continue to fluctuate in the decades to come, and the world's energy systems are also undergoing game-changing technological and political shifts. These range from the shale revolution and the splintering of OPEC to the dropping cost of renewables and batteries, as well as from transportation and building efficiencies to the emergence of air quality as a major political issue in Asia. As a result, governments around the world have begun to make policy decisions to reduce emissions and change their energy sources.

The world is changing

Albertans are already being affected by floods, drought, pine beetle invasions, and summers of smoke and poor air quality from forest fires. All of these events are being aggravated by climate change, and will become more severe.

In addition to these impacts, Alberta's future as an energy provider is directly linked to an ability to demonstrate a demand for its products in a decarbonizing world. With the right policies, Alberta can be competitive, attract investment, spur innovation and remain a supplier of choice in the global energy market.

The people of Alberta want to get a fair return on our oil and gas reserves, and have a stable and reliable economy to support their families. However, most Albertans also agree our economy is too dependent on oil and gas, and we need to look ahead. As a province rich in resources, innovators and entrepreneurs, Alberta must invest and plan for the future in order to preserve the safe, prosperous, high quality ways of life we have come to enjoy.

Alberta can play a leadership role in a changing energy landscape

We believe all political parties need to have strong policies that protect the current and future interests of Alberta, giving the province's industries the ability to compete in a low carbon future, while ensuring its people have opportunities to thrive for generations to come.

The Pembina Institute has identified areas where governments can play a leadership role in helping Alberta prosper in this rapidly changing energy future. We believe these issues are cross-partisan, but more importantly, that they are essential to the health and prosperity of this place we all call home.

Alberta is a province of builders, innovators and problem solvers. Thanks to a strong history as energy leaders, Alberta is also well positioned to lead the charge in a new energy reality.

There is no going back in this rapidly changing world. However, that does not mean Alberta must be left behind.



Who we are

The Pembina Institute is a non-partisan, evidence-based research organization. For more than 30 years, we have consistently collaborated with oil and gas companies, public interest groups, industry stakeholders, all levels of government, and Albertans across the political spectrum to find practical solutions for shared energy issues.

We are Alberta born and bred

Our organization was founded in the heart of Alberta, in Drayton Valley, as a response to the Lodgepole Blowout. We continue that legacy by supporting responsible and appropriate energy development in our work in Alberta and Canada. While we have grown into a national organization that also works on broader energy issues, such as building efficiency and transportation systems, our organizational foundation is Albertan — practical, hard-working, realistic, ambitious and collaborative.

We work on energy and climate issues

We are an organization that focuses on energy and climate issues; we are not against the oil and gas industry. We collaborate and work to advance practical policy solutions that ensure responsible and balanced energy development in the best interest of all Albertans.

We believe the economy and the environment should go hand in hand

True to this, our full name is the Pembina Institute for Appropriate Development. We believe in responsible fossil fuel development, by acknowledging that the world is changing and that we need to adapt. That doesn't mean shutting down the industry — it means having a thoughtful, open and rational discussion about difficult issues around how Alberta, its economy, and the oil and gas sector can be best positioned to manage shifts in economics and demand, respond to climate change, and adjust for other environmental factors.

We are a non-partisan research organization that advises on policy

For more than 30 years our staff of economists, scientists, engineers and former business consultants have worked collaboratively to advise the oil and gas industry and the Alberta government of the day on practical, evidence-based solutions for energy and climate issues. For the past several years there has been accelerated global action to implement climate and energy policies, providing both economic opportunities and obstacles that impact Alberta's economy. These types of policies land within our areas of expertise, and we are eager to sit at the table with leaders of all political stripes to find workable and practical solutions. We look for allies wherever they may be, no matter how unlikely, because the issues we work on matter to all Albertans.



A vision for Alberta's future

Energy leadership in Alberta means setting ourselves up for where things are headed — not trying to get back to where they were — and facilitating the creativity needed to get there. In the past, the province has benefited from this kind of thinking — the development of in-situ oilsands production is a prime example of addressing a complex economic problem with an innovative solution.

That same spirit and vision is needed to secure Alberta's future and set a new standard for how business-as-usual looks. Global attention to energy and climate questions will continue to be an important focus for citizens, governments, investors and the energy industry alike, and Alberta needs to build alliances, not isolate itself.

To ensure our province can take advantage of future economic opportunities, Alberta needs leadership on these key issues:

Competitive industries with fewer emissions

Innovative technology: Alberta has a long history of taking ambitious action and driving real innovation that unlocks the potential of new technologies. The province's oil and gas sector is a key economic pillar, but the industry needs to be encouraged to evolve and adapt to changing international perspectives. There is a role for public investments in research and development, and diversifying the economy through innovation.

Renewable energy: Alberta has some of the best renewable resources in Canada. With the falling costs of solar and wind energy, our electricity sector has entered a new reality where renewable generation is the most economic source of new electricity generation for the province. There are significant opportunities to supply the majority of Alberta households and industries with reliable, clean, cheap electricity.

Energy efficiency: Energy efficiency is an untapped resource. Using energy more efficiently saves money for all Albertans by cutting personal energy costs and reducing the need to build new electricity

infrastructure, while increasing jobs in the installation, education and consulting of energy efficiency products and services.

Oilsands and methane: Public scrutiny of the link between oil and gas production and climate change continues to grow, not only in Canada, but globally. The more Alberta's producers can reduce their emissions, the more competitive they will be. Policies to encourage low emission production can — and should — help drive technological innovation and implementation, not only leading to lower emissions, but also lower costs.



Healthy communities and landscapes

Transportation: When it comes to carbon pollution, the focus is often on industrial emissions, but we all have a role to play. How people and goods are moved across vast territory contributes significantly to Alberta's total emissions. Smart policies that encourage the uptake of transportation alternatives for Albertans and better public transit can go the extra mile on the province's emissions.

Coal phase-out: Globally, nationally and locally the phase-out of coal is inevitable, and makes sense. However, adequate planning and programs are required to ensure that communities and workers are supported through the transition and that opportunities in the clean energy sector are created for those whose livelihoods have been dependent on this sector.

Land conservation: 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, and address longstanding issues from the

cumulative impacts of energy development over the long term.

Oil and gas liabilities: Alberta taxpayers have a right to the full picture, in order to understand the degree of fiscal and environmental risk posed to the province over the long term by oil and gas liabilities, and to enable smart government planning to ensure fair polluter-pay programs are implemented.

Addressing climate change

Although Alberta's share of emissions may seem a small part of the needed global efforts, all levels of government, industry and public interest groups must do their share. Economists note that carbon pricing is the most effective way to cut emissions, while complementary policies support further reductions while managing other important considerations. The financial burden of climate action can be mitigated when governments choose to reduce the tax burden on small businesses and families. Meanwhile, the revenue from a price on pollution provides opportunities to further reduce emissions by reinvesting in renewables, energy efficiency and innovation.



Innovative technology

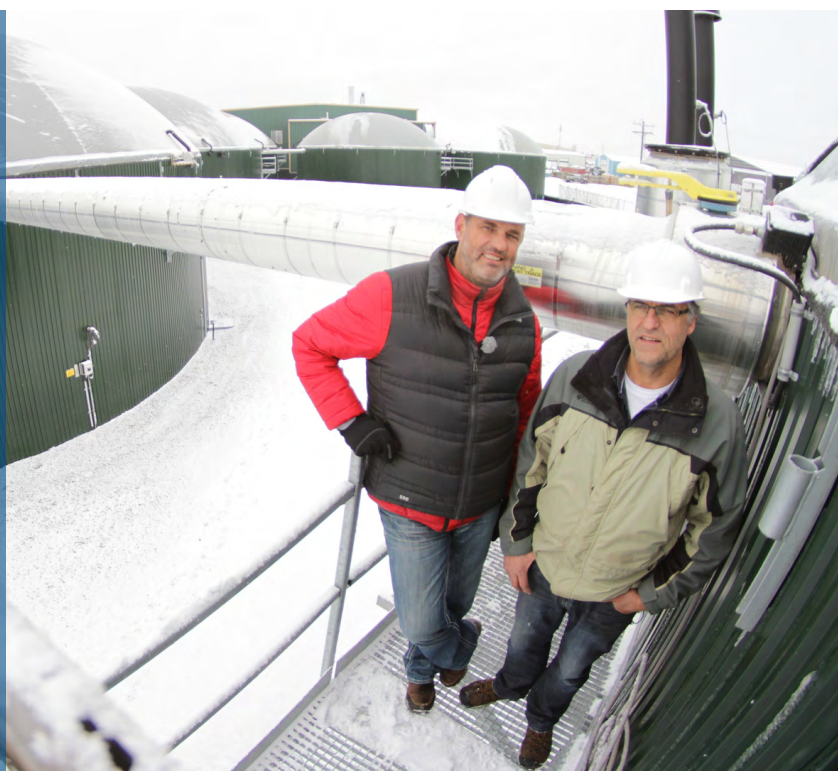
Alberta has a long history of taking ambitious action and driving real innovation that unlocks the potential of new technologies and create opportunities. The Alberta Oil Sands Technology Research Authority (AOSTRA) and the Advanced Machine Learning Institute in Edmonton are prime examples. The emergence of industry alliances like the Clean Resources Innovation Network and Canada's Oil Sands Innovation Alliance (COSIA) — both led by the oil and gas sector — as well as Rainforest Alberta, the Alberta Clean Technology Innovation Alliance, and the SmartAg corridor in Olds are further examples of how the private sector in Alberta continues to drive this culture of innovation.

Alberta's oil and gas sector is a key economic pillar, but its future competitiveness has challenges that need to be addressed, including high production costs; high greenhouse gas emissions intensity and sulphur content; emerging disruptive technologies; and projections of a plateau and decline in the global demand for oil.

The Government of Alberta's reliance on revenue tied to this sector's developments will become a financial risk unless the industry is encouraged to evolve, diversify and adapt to changing international perspectives. We believe there is a role for government in re-tooling and diversifying the economy through innovation.

Energy leadership means:

- ✓ increasing funding for clean tech development initiatives
- ✓ enhancing novel forms of financing to incent investment in efficiency and methane reduction in legacy upstream oil and gas assets
- ✓ creating incentives for focused investment in innovative technologies that help drive emissions reductions



Renewable energy

Alberta has some of the best renewable resources in Canada. Even solar resources in the north of the province are as good as those found in Germany, a global leader in solar energy. With the falling costs of solar and wind energy, our electricity sector has entered a new reality where renewable generation is the most economic source of new electricity generation for the province. Between 2025 and 2030, new wind and solar facilities are expected to be cheaper than existing coal and gas units.

Renewable energy provides rural Albertans with an additional source of revenue through lease payments, creates local jobs, and provides tax revenue for communities. Progress is already underway in the province on initiatives supporting a transition away from diesel reliance in remote communities.

There is also greater job potential associated with manufacturing if there is a steady growth of renewables in the province.

Wind and solar can also help reduce the cost of electricity for consumers. It is no surprise that there is considerable support in the province for renewable generation, and in particular the energy independence that comes from self-generation. Like the U.S., the same potential and opportunities exist in Alberta for companies and institutions to invest in renewable energy to power their own operations. Policy certainty and support programs are needed to continue to attract investment in renewable energy industry and to reap its economic benefits in Alberta.

Energy leadership means:

- ✓ accelerating the pace of renewables growth in the province through support programs and market-based mechanisms
- ✓ supporting energy independence for Albertans by enabling small-scale projects that have significant participation from communities, individuals, and businesses
- ✓ providing targeted support to help remote communities establish clean and secure energy sources



Energy efficiency

Energy efficiency is an underused resource with a huge potential to broaden Alberta's economy. Using energy more efficiently saves money for all Albertans by cutting personal energy costs and reducing the need to build new electricity infrastructure, while increasing jobs in the installation, education and consulting of energy efficiency products and services.

In recent years, we have seen investment in this sector — more than 2,300 jobs have been created, and membership in the Alberta Energy Efficiency

Alliance has doubled. However, there is untapped potential in energy efficiency advancements.

By leveraging these opportunities, not only are thousands of new jobs created, but Albertans avoid unnecessary utility cost increases, while the province avoids the need for expensive utility infrastructure expansion.

Energy leadership means:

- ✓ creating a target to achieve annual energy efficiency savings, and increase investment in energy efficiency whenever cost-efficient
- ✓ legislating building codes to move towards net-zero emissions by 2030



Oilsands and methane

Public scrutiny of the link between oil and gas production and climate change continues to grow, not only in Canada, but globally. Other nations are working to decrease emissions, and reduce — or even end — fossil fuel dependence. Expanded efforts within the oil and gas sector to cut emissions and stay in line with international agreements intended to ensure a climate safe world will be crucial in determining its future opportunities. The more Alberta's industry can reduce its emissions, the more competitive it will be.

Alberta's oilsands continue to represent the fastest growing source of emissions in Canada. Moreover, if they continue with their current emissions trends, they will account for more than 80 per cent of Canada's total emissions by 2050.

If not thoughtfully managed, the oilsands represent an impediment to Alberta and Canada contributing

to the considerable global effort under the Paris agreement to keep the planet within a safe and stable climate. Meanwhile, Alberta has committed to setting an oilsands emissions limit of 100 Mt limit per year, and to reducing methane emissions from the oil and gas sector by 45 per cent by 2025, based on 2012 levels.

These actions are a first step towards developing a long-term approach to reduce greenhouse gases and ensure the sector's emissions fit with Canada's climate commitments for 2030 and 2050. Although exact targets need to be part of a national strategy, there must be a plan to peak and then reduce oilsands emissions in the coming decades, not only for Alberta to do its share in meeting Canadian climate commitments, but in order for the industry to remain viable.

Energy leadership means:

- ✓ working to meet Canada's international commitments on climate change for both 2030 and 2050
- ✓ reducing oilsands emissions through strategic policies and regulations in order to meet these obligations
- ✓ implement the regulations that will enforce Alberta's commitment to a 100 Mt cap for oilsands emissions
- ✓ taking regulatory action to improve the existing methane regulations in order to meet federal equivalency standards, and achieve a 45 per cent reduction of methane emissions in Alberta



Transportation

When it comes to carbon pollution the focus is often on industrial emissions, but we all have a role to play. Reducing emissions from transportation is one of the quickest and most effective ways to reduce greenhouse gas pollution.

Alberta communities have made great strides in expanding their public transportation networks, with the ongoing construction of key projects like GreenTRIP, the Calgary Green Line and the Edmonton Valley Line expansion. Alberta has taken the important step of dedicating sustainable revenue to transit expansion.

Still, too few Albertans have fast, frequent and affordable alternatives, such as transit, car shares and cycling lanes. But even those kinds of urban options are sometimes not realistic for large swaths of rural Alberta. One solution is to look toward the growing interest in zero emission vehicles (ZEVs).

Other provinces have programs and regulations to help residents buy zero emissions vehicles, and offer a broader range of vehicle options by setting mandatory quotas for ZEV sales. We are starting to see Albertans asking for the same.

Energy leadership means:

- ✓ maintaining or increasing investments in lower-emissions transportation, including public transit, car sharing, cycling infrastructure and low-emission vehicles
- ✓ taking steps to make ZEVs and related infrastructure more affordable, available and accessible in Alberta



Coal phase-out

Coal plants are shutting down across the globe because of their negative health impacts and low profitability. In Alberta, coal is a large greenhouse gas emitter, similar in scale to oilsands extraction, and contributes to Alberta's increasing air pollution with toxins such as sulphur dioxide, nitrogen oxides and mercury that are harmful to human health. At the same time, the low cost of renewables is making coal increasingly less competitive.

Alberta's plan to phase out coal by 2030 has been followed by a similar commitment by the federal government. It has been accepted by the electricity producers in Alberta and has triggered industry investment in innovative solutions and new low- and zero-carbon technologies. The phase-out of coal is inevitable and necessary; however, adequate planning and programs are required to ensure that communities and workers are supported through the transition and that opportunities in the clean energy sector are created.

Energy leadership means:

- ✓ continuing the planned phase-out of coal pollution in Alberta by 2030
- ✓ creating a just transition plan to support the communities and workers affected by these changes



Land conservation

Biodiversity is in decline around the world, including in Alberta; this threatens to destabilize critical ecosystems and erode natural resource-based economies, and could result in the loss of iconic Canadian species within our lifetime. 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.

Establishment of protected areas can support our resource-based industries, as evidenced by industry's contributions to the world's largest boreal protected area adjacent to the oilsands, and the proposed legislation of the Ronald Lake Biodiversity Stewardship Area. Establishment of new parks and recreation areas is highly popular among Albertans and also enhances opportunities for all types of recreational uses.

Energy leadership means:

- ✓ doing Alberta's share to support Canada's stated goal to protect 17 per cent of terrestrial and inland waters by 2020
- ✓ continuing to establish conservation areas in partnership with Indigenous peoples and local communities in order to meet this commitment



Oil and gas liabilities

A significant amount of oil and gas liability risk has built up in Alberta over the past 60 years. More than a third of Alberta's oil and gas wells are not active, but neither are they properly cleaned up. Inactive wells are being offloaded to the province's Orphan Well Association as decades of ineffective reclamation policies have created a bubble of unsecured liability in the backyards of many Albertans. Meanwhile, the industry has accumulated some 1.4 trillion litres — and growing — of problematic tailings from the oilsands mining sector.

Alberta taxpayers have a right to the full picture, in order to understand the degree of fiscal and environmental risk posed to the province over the long term by oil and gas liabilities. However, it is currently impossible for citizens and stakeholders to independently access credible liability data and evaluate the province's liability management systems.

Energy leadership means:

- ✓ producing an accurate and transparent industry-wide estimate of environmental liability and risk associated with oil and gas, and oilsands facilities
- ✓ implementing mechanisms such as securities or insurance tools to ensure that environmental liabilities are secured, and that Albertans are better protected from potential clean-up costs



Addressing climate change

To address and improve our emissions, we need strong and credible climate policies in place. At the centre of these policies is a price on carbon pollution. Economists note carbon pricing reduces emissions at the lowest economic cost, can drive innovation, and can be designed in a way that protects businesses' competitiveness and low-income households. Additional complementary policies that play an important role in addressing our emissions are methane regulations, phasing out coal, a system that addresses large emitters and an increase of the deployment of renewables.

In 2007, Alberta was the first jurisdiction in North America to implement a price on carbon pollution for large emitters. Since then, Alberta has implemented an economy-wide price on pollution with revenue continuing to be re-invested into Alberta's economy, while supporting programs to reduce Alberta's emissions and ensure low-income Albertans are not disproportionately affected by climate policies. Revenue from pricing pollution in Alberta has been spent to reduce the tax burden of small businesses and of low- and middle-income families, as well as invest in renewables, energy efficiency, clean tech projects and capacity building.

Energy leadership means:

- ✓ legislating an emissions reduction target for Alberta that is consistent with ensuring Canada meets its international obligations under the Paris climate agreement
- ✓ setting an economy-wide price on carbon pollution as a market-based solution to efficiently drive emissions reductions in the most cost effective manner possible
- ✓ maintaining and enhancing Alberta's output-based system for large emitters, which protects them from international exposure while also rewarding efficient operators and incentivizing technology development



Summary: A vision for Alberta's future

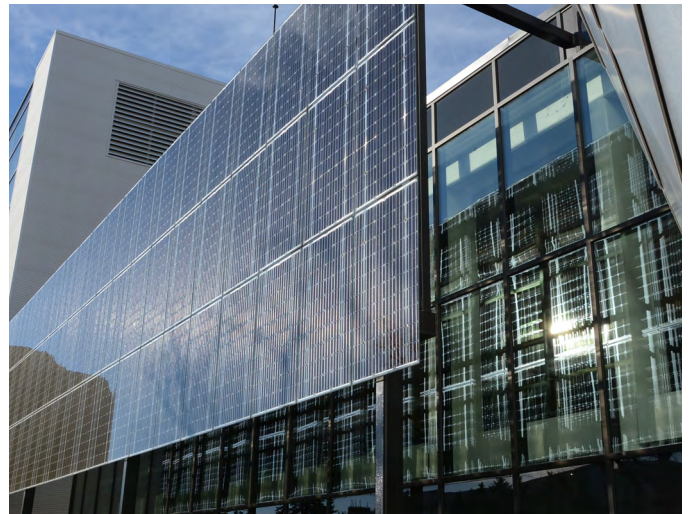
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Land conservation

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Oil and gas liabilities

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