

Alberta

RISKS AND OPPORTUNITIES IN THE GLOBAL LOW-CARBON TRANSITION

About this series of provincial profiles

The Canadian Climate Institute's 2021 *Sink or Swim* report assessed Canada's readiness for the wave of economic change being driven by the global net zero transition. The report stress-tested publicly traded companies under different global low-carbon scenarios to better understand the risks to Canada's economy and, more specifically, the risks to workers, communities, Indigenous Peoples, and the financial sector. The report also used new data from PitchBook Data Inc. to gain insights on the opportunities created by the transition, identifying significant potential sources of new growth for the country across several sectors.

Building on that research, the Climate Institute has now done a deeper analysis of the transition risks and opportunities facing specific provinces and regions. In addition to assessing risks, these province-by-province profiles provide in-depth analysis and insight on where provinces and regions can generate new sources of growth, the barriers that may be holding them back, and how to address those barriers. An overview report, *Net Zero Opportunities: A province-by-province comparison*, provides detailed analysis of how provinces and regions across Canada can navigate the net zero transition.

Alberta has a foothold in several emerging markets—such as hydrogen, geothermal, and CCUS—and its deregulated electricity market is attracting significant new investment in renewables. Mature emissions-intensive companies, such as chemical producers, are also making significant investments to decarbonize. Alberta's ability to capture growth opportunities, however, is hampered by mixed policy signals and dominance of the oil and gas sector.

The stakes for Alberta in the global low-carbon transition are high. Several communities have large concentrations of their workforce in transition-vulnerable sectors and could see significant labour force disruption as global demand for Alberta's largest exports declines. Consistent and ambitious policies to decarbonize and diversify Alberta's economy can enable a smoother transition, particularly for transition-vulnerable communities in rural areas.

Risks-and-opportunities profiles

Workforce and communities

- Alberta has the highest proportion in Canada of workers in transition-vulnerable sectors (9%) (Samson et al. 2021).
- Five communities have workforces that are highly concentrated in transition-vulnerable sectors, primarily in oil and gas: Wood Buffalo (29%), Lloydminster (16%), Cold Lake (16%), Sylvan Lake (14%) and Grande Prairie (9%).
- Roughly 16% of transition-vulnerable workers in Alberta are visible minorities and 5% are Indigenous.¹

Economic and fiscal risks

- Mining, quarrying, and oil and gas accounted for 14% of provincial GDP in 2020 and are the largest sources of inward foreign direct investment (Samson et al. 2021).
- In the 2019–20 fiscal year, royalties from the oil and gas sector generated over \$5B in provincial revenues (Government of Alberta 2022).²
- Global climate action (United States policy in particular), growing interest in border carbon adjustments, and technological change could be increasingly disruptive to Alberta's oil and gas sector.³
- Due to higher breakeven costs, new greenfield oil investments are unlikely in the coming decades; higher-cost producers are likely to lose market share as global demand declines.
- Alberta ranks third last among provinces and territories for economic benefit agreements between mining companies, and Indigenous communities and governments (1.5% of exploration and mining projects) (Government of Canada 2022).

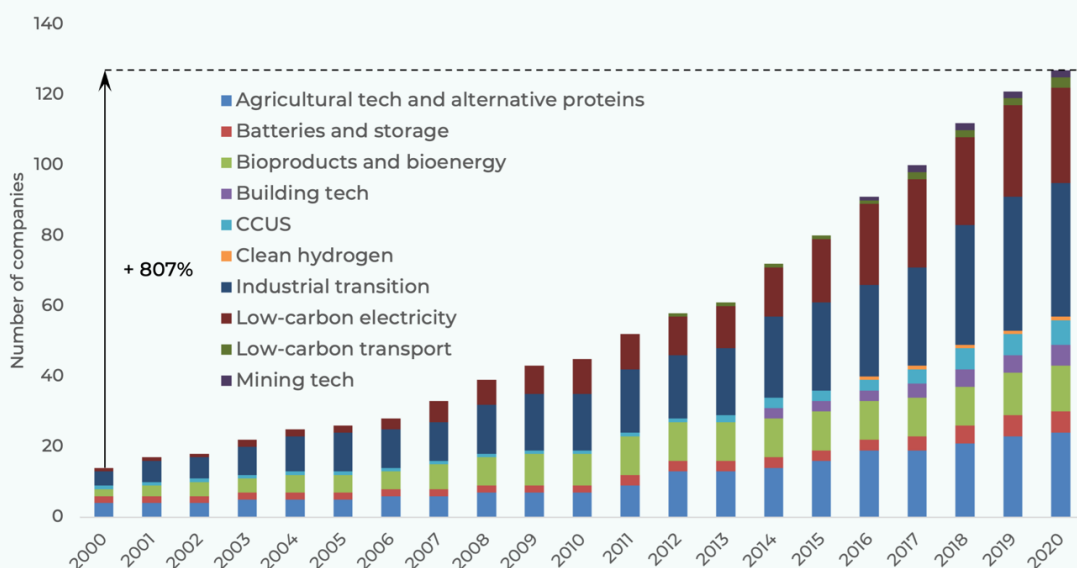
Growth in transition-opportunity companies headquartered in the province

- Alberta has 130 companies active and attracting investment in several transition-opportunity markets (see Figure below). More than half of these companies are less than 10 years old.
- Nearly three-quarters of Alberta's transition-opportunity companies are in industrial transition (29%), low-carbon electricity (21%), or agricultural technology and alternative proteins (20%).
- Most companies are either headquartered in Calgary (71%) or Edmonton (17%).

Competitive strengths

- Natural assets: significant potential for additional wind and solar power generation and potential for geothermal and geological storage (Canadian Renewable Energy Association 2022).
- A highly developed industrial base and skilled workforce.⁴
- A deregulated electricity market conducive to private investment and innovation.
- A mature agricultural sector in close proximity to the United States/ international markets; a growing number of companies in precision-based agriculture and alternative proteins.

Growth in transition-opportunity companies in Alberta



Source: PitchBook Data Inc. (2022). Notes: This figure shows the number of companies headquartered in Alberta operating in each of our 10 transition-opportunity markets in each year between 2000 and 2020. This analysis only counts "pureplay" companies whose primary business line involves a product, technology, or service that falls into one (or more) of our 10 transition-opportunity markets (see our [overview report](#) for a full description). Thus, large multinationals and conglomerates with only a portion of sales in these markets are excluded. The analysis also only counts companies that are currently active (i.e. excludes bankrupt companies) and still operate as a subsidiary in cases when the company has been acquired.

Trends in Alberta's transition readiness

In demand-creation markets, low-carbon electricity continues to be the largest source of new investment, while investments in other, less mature areas remain relatively low.⁵

- Measured by total investment raised, five of the top six transition-opportunity companies in Alberta operate in low-carbon electricity (see Figure below). Major investments include:
 - » **Tidewater Renewables**, a producer of low-carbon fuels, raised US\$119M in its 2021 initial public offering.⁶
 - » **Eavor**, a developer of geothermal technology, raised US\$51M in early-stage venture capital in 2021.
- A significant portion of new contracted wind, solar, and storage capacity is being brought online by corporate or institutional buyers, under corporate renewable energy deals:
 - » **RBC** was the first Canadian bank to purchase a long-term renewable energy power purchase agreement for two new utility-scale solar farms (39MW capacity with **Bullfrog Power** and **BluEarth Renewables**).⁷
 - » In partnership with **ATCO**, three First Nations in Fort Chipewyan have built and now operate Canada's largest off-grid solar project (2.2MW), while the **Montana First Nation** manages Canada's largest solar farm in an Indigenous community (5MW) (Omstead 2020, O'Dea 2021).
 - » Alberta has the largest utility-scale lithium-ion storage project in Canada, using **Tesla Megapacks** for grid balancing in three communities (100% owned by a **TD Bank** subsidiary) (Jones 2020).

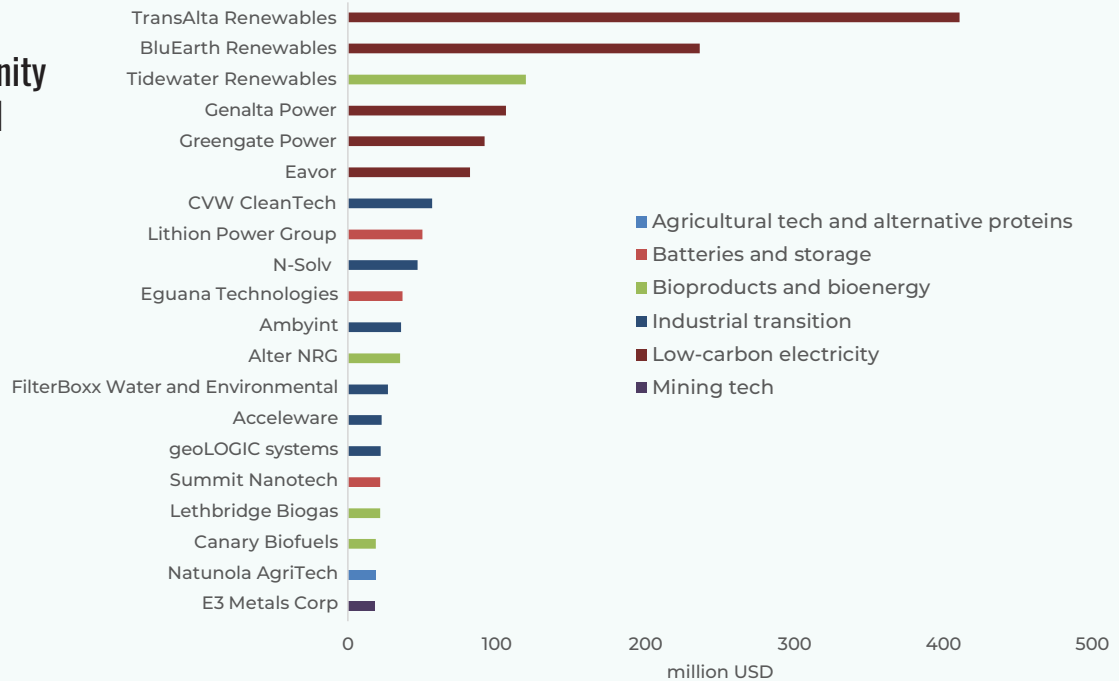
Select carbon-cost companies are making significant investments to produce low-carbon products.

- **Dow Chemical Company** (an American chemical multinational) is building the world's first net zero carbon emissions ethylene and derivatives facility in Fort Saskatchewan (The Dow Chemical Company 2021).⁸ Existing CCUS infrastructure was a major factor in the investment.⁹
- **Air Products** (an American industrial gas and chemical company) is building a \$1.3B net zero blue hydrogen plant in Edmonton (Air Products 2022).

Demand-decline companies are starting to invest in reducing emissions, although few have yet to diversify into new product lines.

- Among the top 20 transition-opportunity companies (see Figure below), seven are in the industrial transition category (i.e. companies that help incumbent sectors reduce greenhouse gas emissions) (PitchBook Data Inc. 2022).
- **Shell, Chevron, and Marathon Oil's** Athabasca Oil Sands Project includes the \$1.3B Quest CCS facility (largely funded by the provincial and federal governments).¹⁰
- The **Alberta Carbon Trunk Line**, a \$1.2B project completed in 2020, is the largest capacity pipeline globally and can transport 14M tonnes of CO₂ annually (it received \$495M from the Alberta government) (Lavery 2020, CBC News 2009).
- As of 2022, **TransAlta**—a major electricity producer in Alberta—completed the last of its coal-to-gas conversions nine years ahead of schedule, marking 3,794MW in total retirement (Aldrich 2021).
- **Suncor** and **ATCO** are partnering to build a hydrogen production facility to power Suncor's refining and cogeneration facilities and to blend with the natural gas distribution grid.¹¹

Top 20 Alberta transition-opportunity companies by total investment raised



Source: PitchBook Data Inc. (2022). Notes: This figure shows the top transition-opportunity companies headquartered in Alberta by total capital raised, which is the net of all capital injected into a company to date. It excludes certain deal types, such as buyouts, corporate asset purchases, debt repayments, and merger/acquisitions. Note that not all identified transition-opportunity companies in our analysis have capital raised data in PitchBook, as not all company deals are disclosed and available.

Potential barriers to scaling up growth opportunities

Provincial-level policies are sending mixed signals to markets and investors.

- Some policy decisions (e.g. cancellation of the Alberta Investor Tax Credit, Energy Efficiency Alberta, Plant Protein Alliance, and expansion of metallurgical coal mining projects) send mixed signals about the pace and scale of low-carbon transition (Delphi Group 2021, Labine 2021).
- Weak incentives for large industrial emitters under the province's output-based pricing system limit interest in large, transformative, low-carbon investments (Sawyer et al. 2021).¹²
- Public financial support for fossil fuels dampens the price signal of carbon pricing.¹³ Alberta provided an estimated \$466M in producer support in 2020, mainly through royalty reductions for enhanced oil recovery and low-productivity and reactivated wells (Samson, Drummond, and Phillips 2022).
- Limited use of policies and regulations to encourage technology adoption in other sectors (e.g. buildings and transportation) (Delphi Group 2021).

Developing "wild card" technologies (e.g. CCUS, clean hydrogen) face a chicken-egg problem, inhibiting private investment.

- High upfront capital costs (i.e. infrastructure necessary to achieve economies of scale), combined with high technology, market, and policy uncertainty discourages private investment in some technology developments (Delphi Group 2021, Samson et al. 2021).
- At the same time, limited tech development and low supply discourage corporate and industry partners from committing to financing commercial pilots.

Legacy fossil fuel assets, combined with policy and market uncertainty, could create a timing mismatch for transforming the sector, increasing the risk of a more disruptive transition.

- Despite efforts and commitments to date, oil and gas companies need to accelerate investment to reduce emissions, shift into new business lines, and stay competitive in global markets.
- If investors and lenders divest, capital costs increase, and declining global oil demand reduces sector revenue, then mobilizing capital for transformational change will be extremely challenging.
- Without consistent and comparable metrics, investor and NGO concerns regarding the environmental credentials of certain opportunities (e.g. emissions from blue hydrogen production with CCUS, biodiversity risks of biofuels) could hamper investment (Delphi Group 2021).
- Alberta continues to expand its supply of natural-gas-powered electricity, increasing the future risk of stranded assets and shifting the burden of emission reductions to other sectors of the economy.¹⁴
- Programs to help Indigenous nations acquire equity stakes in major projects have, to date, mostly focused on demand-decline sectors, which could create longer-term financial challenges as global and domestic markets shift away from fossil fuel combustion.¹⁵

There are significant challenges with transitioning Alberta's workforce to align with global low-carbon transition.

- Transitioning the oil and gas sector is a larger and more complex challenge than transitioning the coal sector. Oil and gas is more exposed to changes in global markets and employs significantly more people (Caranci and Fong 2021).
 - » Oil and gas, and mining and quarrying, employed 139,900 people in Alberta as of January 2022, representing 6.2% of total employment in the province (Statistics Canada 2022).
- Nearly 90% of all transition-opportunity companies in Alberta are headquartered in Calgary and Edmonton, while most transition-vulnerable operations are in rural areas.
- Whereas Alberta's economy has long centred around natural resource extraction, many transition-opportunity companies make decisions based more on labour and human capital, meaning that attracting and retaining talent could be more challenging (Planincic and Kelso 2022).

Conclusion

Looking across the full set of provincial profiles, we see strong signs of progress in transition readiness, although provinces are at different stages in terms of developing and capturing these opportunities.

Government policy can—and must—play a major role in accelerating this momentum. In addition to the broad recommendations laid out in the *Sink or Swim* report, we recommend five specific policy actions in *Net Zero Opportunities: A province-by-province comparison* that can help each province position its economy for success in the net zero transition.

ENDNOTES

¹ The share of visible minorities and Indigenous Peoples employed in Alberta's transition-vulnerable sectors in 2016 was below the total share of visible minorities and Indigenous Peoples in the total population (Statistics Canada 2019, Samson et al. 2021).

² It is important to note that some mining activities could represent future opportunities for Alberta. Currently, however, this sector is dominated by oil and gas activities.

³ For example, the cancellation of the \$9B Keystone XL Pipeline in early 2021 or federal consumer rebates for electric vehicles (U.S. Department of Energy 2022¹).

⁴ A recent survey by Abacus Data (2021) found that 61% of Canadian oil and gas workers support the transition to a low-carbon economy.

⁵ All statistics within the demand-creation section are from PitchBook Data Inc. (2022) unless otherwise stated.

⁶ Tidewater also anticipates \$53M in funding for construction of its British Columbia renewable diesel and hydrogen plant, as provided by the British Columbia Low Carbon Fuel Standard (Part 3) (Tidewater Renewables Ltd. 2021).

⁷ In 2022, Scotiabank also announced a 15-year 40MW solar PPA with Evolugen (Brookfield) (Evolugen 2022, BluEarth Renewables 2020).

⁸ The production process will convert cracker off-gas into hydrogen that would be used as a low-emissions fuel in the production process and carbon dioxide that would be captured onsite to be transported and stored by adjacent third-party CO₂ infrastructure (Canadian Plastics 2021).

⁹ Experts estimate this will cost between \$6B and \$8B (Morey 2021).

¹⁰ The Quest carbon capture and storage project in central Alberta has surpassed the milestone of sequestering five million tonnes of carbon dioxide emissions from oil sands operations (Bakx 2020).

¹¹ An investment decision from ATCO and Suncor is expected in 2024 (Government of Alberta 2022).

¹² The large-emitter carbon pricing systems in Canada (called output-based pricing systems or OBPSs) are designed to protect the competitiveness of emissions-intensive and trade-exposed companies. These pricing systems maintain a price signal to reduce emissions on the margin; however, they reduce an emitter's average costs of compliance so that they are not put at a competitive disadvantage against international companies that do not pay the same carbon price in their home jurisdiction. As global carbon prices increase (including through regulations or border measures), these OBPSs could inhibit the extent to which large emitters in Canada make large, transformative investments to diversify their product mix or significantly reduce their emissions.

¹³ Alberta provided an estimated \$345M on consumer support in 2020, mainly through fuel tax exemptions for off-road vehicles (Samson, Drummond, and Phillips 2022).

¹⁴ Over 1,000MW of new natural-gas-fired electricity generation is currently under development or proposed in Alberta, representing \$1.9B of investment (Government of Alberta 2022).

¹⁵ For example, six Indigenous nations are equity partners in the Cascade Power Project (a major natural gas-fired power plant) which is expected to be completed in 2023 and has a 30-year lifespan (AIOC 2021).

See our webpage for our [Master Reference List](#).

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