

Surfacing Success

Learning from whole-building retrofit projects in Alberta

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Institute

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Summary

Whole-building retrofit projects in Alberta are still rare. While market conditions have enabled some projects, the ultimate driver of progress continues to come from the ambition of key retrofit champions. But as buildings are called upon to adapt to severe weather, to meet changing expectations in the finance, insurance, and real estate sectors, and to maintain asset value, retrofits are increasingly becoming a sound business decision.

This report features key themes learned from four of these noteworthy projects in Alberta. We identify enabling conditions needed to build a strong retrofit sector, as well as gaps in support that hold projects back.

Critical elements for the industry to succeed include:

- Developing a strong business case for retrofits and aligning financing mechanisms
- Building capacity across the ecosystem including contractors, program administrators, and representatives from the finance, insurance, and real estate sectors
- Policy leadership to build market certainty
- Ensuring the right supports are available as buildings approach asset renewal

The finance, insurance, and real estate sectors can also support market development by recognizing the value of resilience-focused retrofits through better lending terms, insurance products with lower rates and premiums, and updated appraisal and underwriting practices.

Introduction

Across Canada, households and businesses have been grappling with affordability challenges, energy security issues, and economic uncertainty. These challenges are deeply felt in Alberta where insurance premiums have risen by 400% in 20 years,¹ and where building owners pay among the highest and most variable electricity costs.² And critically, where severe weather events continue to threaten the resilience of our homes and buildings.³

Since 2013, Alberta has faced five severe weather events creating over \$1 billion in damages and insured losses. Much of the province's building stock was constructed for less extreme weather conditions, leaving Albertans highly exposed to new risks and property damage. Considering more than 70% of the buildings that will be here in 2050 have already been built, these existing buildings must be retrofitted to higher performance standards. The current retrofit pace, however, is less than 1% of buildings per year. At that pace it would take over 100 years to fully prepare Alberta's buildings for the changing environment.

With these growing challenges, whole-building retrofits are an increasingly sound business decision. Upgrades to core building systems, like envelope and heating systems, can improve the energy productivity of a building, lower energy costs, and improve resilience to severe weather, all while improving occupant health and comfort.

In fact, many building owners in Alberta will soon face the reality that retrofitting is the best way to improve building operations, protect both occupants and asset value, and maintain affordability. Furthermore, the federal government's recent strategy to electrify Canada's economy is poised to reshape Canada's electricity system to one in which buildings play a role as key grid participants.⁴ Recognizing the role of electrification in advancing Canada's energy security and climate goals, the federal government aims to support the retrofit of one million homes across the country, including electrifying heating and cooling systems.

To help spur action and demonstrate to building owners what is possible, this project showcases four successful whole-building retrofits in Alberta.

¹ Marisa McGillivray, *Extreme weather impacts on consumers and insurers in Canada, December 2019 to December 2025: An updated analysis* (Statistics Canada, 2026), 8. <https://www150.statcan.gc.ca/n1/en/pub/11-621-m/11-621-m2026007-eng.pdf?st=rEFjNJLz>

² Canada Energy Regulator, "Market Snapshot: How much do your neighbours across Canada pay for electricity?," March 4, 2026. <https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2026/market-snapshot-how-much-do-your-neighbours-across-canada-pay-for-electricity.html>

³ Canadian Climate Institute, "FACT SHEET: Climate change and storms," April 22, 2025. <https://climateinstitute.ca/news/fact-sheet-climate-change-and-storms/>

⁴ Natural Resources Canada, *Powering Canada Strong: A National Strategy for an Electrified Canadian Economy* (2026). <https://natural-resources.canada.ca/energy-sources/electricity-infrastructure/powering-canada-strong-national-strategy-electrified-canadian-economy>

Methodology

Alberta is home to several outstanding retrofit projects. These noteworthy projects highlight the supportive conditions and gaps currently experienced in delivering whole-building retrofits. Key personnel who worked directly on whole-building retrofit projects in Alberta were interviewed, and retrofit barriers were reviewed. The interview and review findings were then analyzed to identify enabling conditions for whole-building retrofits in Alberta.

Review of barriers

Through conversations with industry experts and in the review of relevant literature, we identified and categorized 164 unique barriers to retrofitting in Alberta. The findings are discussed in a blog post (referenced in the footnote below) and summarized in the table here.

Barriers	Discussion
Complex permitting and regulatory delays	Retrofits require permits, inspections, and approvals from multiple levels of government and utilities. These agencies do not always work in collaboration, and this causes project delays, driving up costs and even deterring contractor involvement.
Financing gaps	Building owners see retrofits as a financial gamble, as the business case is not always clear or well communicated. Financing exists, but the loan terms, eligibility requirements, and complicated procurement process may not be the right fit.
Utility cost gaps	Alberta currently lacks regulation that would allow utilities to lead retrofit programs. Such programs exist in every other Canadian province and facilitate easier, more financially viable retrofits while delivering system benefits for all ratepayers.
Market perception and risk	There is a strong market perception that retrofits are difficult, costly, and risky, further deterring building owner investment and engagement. Even when projects are successfully completed with a strong business case, they can be met with skepticism.
Fragmented incentives	Keeping track of funding programs that are susceptible to boom-bust cycles can be a challenge, as can learning and meeting their eligibility requirements or keeping pace with timelines.
Workforce capacity	With anticipated retirements and growth in the retrofit sector, workforce shortages are looming. Alberta expects to see a skill gap in HVAC systems and labour gap in electricians.
Limited delivery pathways	Retrofitting requires intentional planning and project coordination to go from energy audit to implementation. Projects can lose momentum and be deprioritized if project teams and plans are not in place to ensure effective delivery. This gap between planning and execution can cause early enthusiasm to fade.

Source: Emma Caramazza and Kari Hyde⁵

⁵ Emma Caramazza and Kari Hyde, “Alberta faces retrofit roadblocks,” Pembina Institute, August 19, 2025. <https://www.pembina.org/blog/alberta-faces-retrofit-roadblocks>

Project case studies

Building	Retrofit details	Impact
Tennyson Apartments Four storey, 163-unit apartment complex in Edmonton built in 2004.	Addition of variable speed pumps to the heating boilers Heating dispersion additive to heating fluid media Roof insulation upgraded HVAC optimization Low-flow faucet fixtures New domestic hot water heaters Solar photovoltaic systems (169 kW and 119 kW)	Anticipated energy savings of 32% \$12,000 anticipated in monthly utility savings 33% anticipated reduction in greenhouse gas emissions
Hi-Tech Seals Manufacturing warehouse in Edmonton. Originally built in 1996, retrofit saw the building's expansion to 30,000 square feet.	Building expansion Energy efficiency upgrades Ground source geothermal heat pump system: 14,400 feet of boreholes, 11 heat pumps 248 kW rooftop solar photovoltaic	Full electrification \$1,100 in monthly utility savings Zero carbon emissions
Glenbow Eight-storey, 312,000-square-foot art museum in downtown Calgary built in the 1970s.	Aesthetics and accessibility High performing envelope Replacing obsolete systems Upgrading to NBC 2019 – Alberta Edition	Anticipated energy saving of 38% 41% anticipated reduction in greenhouse gas emissions
Sundance Housing Co-operative Edmonton complex of 15 buildings including 59 town homes, 10 duplexes, and 9 senior suite apartments. Originally constructed in 1978.	Panelized prefabricated exterior retrofits Recladding of the units Insulation added to foundation walls New HVAC systems (cold climate air source high-efficiency electric heat pumps) 266 kW rooftop solar photovoltaic	Anticipated net energy reduction of 94% 84% anticipated reduction in greenhouse gas emissions

Key themes from the projects examined

Through conversations with key partners involved in retrofit projects, we learned that a successful retrofit industry depends on a strong business case, financing, leadership, and timing. These conversations also revealed that, while retrofitting is entirely feasible today, Alberta's retrofit ecosystem is not yet prepared to move retrofits from exceptional to expected.

Theme: Building lifecycle timing creates retrofit opportunity

A shared theme across all four interviews was that retrofit success is a matter of being prepared when the moment for building changes comes. Hi-Tech Seals, a manufacturer and distributor of industrial seals and gaskets, leveraged a roof repair to install solar panels; Tennyson Apartments timed its retrofit with work needed to resolve deferred maintenance and equipment reaching end of life; Glenbow saw retrofitting as the only viable path forward, as relocating would mean losing its high-traffic downtown location and because the city expected they perform 40% better than NECB 2017; and Sundance aligned its retrofit project with the goal of renewing 59 housing units.

Building owners should begin to scope out their expected asset renewal timelines to optimize retrofitting multiple building systems at once.

Theme: Funding mechanisms support a strong business case to enable retrofits

One of the most frequently cited barriers to retrofitting is the lack of recognition for the retrofit business case. Whether it is the high upfront cost or the long payback period in energy savings, building owners hold back from retrofitting because of these cost uncertainties. On the flip side, it has never been easier to do a retrofit: in every province in Canada, municipalities, utilities, or other partners offer retrofit support. A theme across these case studies was that projects are more likely to move forward if there is a strong business case, and they all found creative ways of developing it.

Hi-Tech Seals credit much of their success to an innovative approach to common accounting frameworks that understand their building as a depreciable asset. They were able to write off their geothermal system using Capital Cost Allowance Class 43.2 (which pertains to clean energy generation and energy conservation equipment).

The owners of Tennyson Apartments made their business case feasible by bringing Efficiency Capital on board as a third-party financier and by using Canada Mortgage and Housing Corporation (CMHC)'s Mortgage Loan Insurance (MLI) Select program. Efficiency Capital's "efficiency as a service" model means they developed, funded, managed, and took on all the risk for Tennyson Apartments' retrofit. This approach freed capacity for the building owners, ensuring Tennyson didn't need to take on new debt or redirect resources to offset potentially high upfront capital expenses. CMHC's MLI Select program offers participants higher loan-to-value ratios, increased amortization, lower debt coverage ratios, and reduced premiums in exchange for commitments to positive social outcomes in affordability, accessibility, and climate compatibility.

Glenbow stands out in the case studies because it operates in a building owned by the province, leased on city-owned land. This approach opened opportunities for public funding.

The Sundance project also credits favourable financing conditions for enabling their project. The buildings are owned by the co-operative which leases the land upon which the buildings are located from the City of Edmonton; their outstanding work in sustainability and affordable housing prompted the city to recognize those efforts with favourable leasing terms. The co-operative also timed the project with their mortgage renewal and were able to refinance with a credit union at a lower rate — helping keep housing charges stable for the members. Additionally, they secured a \$6-million loan from the Federation of Canadian Municipalities' Green Municipal Fund. The alignment of all these favourable and rewarding financial agreements enabled the project to launch.

Reflecting on these experiences, it is clear that financial literacy is a critical condition for success.

Theme: Champions bring success

While funding mechanisms were key enablers of projects, they don't drive motivation. For that, each project relied on key champions to move the retrofit project forward.

With Tennyson Apartments, C-suite proponents championed the retrofit which ensured it remained a priority and wasn't halted by bumps in the road. With Hi-Tech Seals, trusted experts in accounting and renewable energy created owner confidence, which moved the project to implementation.

Sundance is well-established as a leader on several fronts. The co-operative created one of the first recycling programs in western Canada, they led the build-out of a large network of co-operative housing projects in Alberta, and became a leader in bringing prefabricated, Energiesprong-style retrofits to Canada.⁶ They also credit the specific work of one founder with great skill in acquiring funding and financing, as well in project managing contractors and architects.

Nicholas Bell, former President and CEO of Glenbow, has defined his career by redesigning and improving museums. Before joining Glenbow, Bell was employed by the Smithsonian American Art Museum where he led a major renovation of the Renwick Gallery. Bell serves as an excellent example of how C-suite leadership, as well as experience, can bring great projects to fruition.

⁶ Natural Resources Canada, "Sundance Housing Rehabilitation Project," May 28, 2025. <https://natural-resources.canada.ca/funding-partnerships/sundance-housing-rehabilitation-project>

Glenbow Reimagined also exemplifies institutional leadership:⁷ public institutions have a responsibility to demonstrate excellence. In recognizing this civic mandate, Glenbow has taken a leading approach to adaptive reuse and building retrofits in Calgary and Alberta.

Theme: Whole-building retrofits are feasible, but the ecosystem is not ready for them to go mainstream

Large retrofits, for example major mechanical equipment changes or building envelope upgrades, typically only occur once over the course of several decades. This reinforces the importance of doing things right the first time, otherwise deeper system improvement and emissions reduction opportunities are missed. Unfortunately, a system-wide theme gleaned from interviews is a misalignment between the ambitions of the building owner and the resources available through programs offered by different levels of government.

For Tennyson Apartments, this theme surfaced during the application, audit and reporting processes of their primary funding source. In the beginning, the timeline to do a detailed audit was far too quick after they acquired the building. A compromise was struck leading to a cursory audit. The owners then went back after their application and did a more detailed and accurate audit. And while post-audit assessments indicated the retrofit drove efficiency achievements beyond that initially scoped, they were not rewarded for surpassing expected performance. They also had difficulty claiming credit for solar energy generation fed back into the grid, to the point that Tennyson left it out of their final reporting despite the project featuring two large solar arrays.

Hi-Tech Seals faced similar challenges with retrofit program administration. Program funding caps were too low to make projects feasible. This was especially important considering the retrofit saw the installation of a \$30 million renewable energy project. Given the high upfront costs of retrofit projects, a lack of funding resources can limit or stop projects before they start. They also cited time spent justifying key elements of their business case to program administrators; for example, removing their final gas-fired hot water tank so they could completely electrify and disconnect their gas meter. From the interviewee's perspective, the program administrators who allocate funds for clean energy projects do not have the risk assessment and underwriting perspective that a bank does, leading to delays and stress.

The experience of Hi-Tech Seals in leading a geothermal installation in 2006 and a rooftop solar project in 2023 revealed a growing skill gap in qualified tradespersons in Alberta. Research conducted by WSP Canada Inc. and the Southern Alberta Institute of Technology echo the

⁷ Glenbow, "Glenbow Reimagined: The latest on Glenbow's renovation," December 13, 2022. <https://www.glenbow.org/blog/glenbow-reimagined-2/>

growing demand and potential shortages in solar engineers and geothermal technicians.⁸ The Sundance Co-operative experienced labour constraints too: they believe for projects to succeed, you need a team of contractors committed to high performance, but that those skills are a challenge to find. They relied on their trusted network with specialized knowledge and problem-solving capacity to reach their retrofit goals. As an example of how proponents can counterbalance the labour issue, Hi-Tech Seals now hosts tours of their building focused on supporting engineers and owners working on geothermal projects in Alberta.

Enabling conditions for whole-building retrofits

These projects demonstrate that whole-building retrofits are feasible in Alberta, with several proofs of concept across institutional, commercial, multi-unit, and townhouse buildings. However, to move the market from exceptional to expected, the following mutually supportive ingredients are needed.

The right support at the right time

One of the top retrofit challenges continues to be finding the right supports, and at the right time. With federal policy signals from the recent electricity strategy, insurance premiums rising from severe weather events, and with many buildings reaching the end of life of core systems, building owners are going to come face to face with the inevitability of electrification and resilience-focused retrofits. If the right supports are not accessible when owners most need them, owners are likely to scale back project scope and miss the opportunity for energy savings, building hardening, and electrification.

A strong business case

The retrofits studied were motivated by environmental consciousness but justified with strong business cases. A practical framework for valuing retrofits needs to move beyond energy efficiency with market-ready metrics and defensible methods. This should include mortgage and insurance offerings, incentive programs, tenant retention and comfort, grid services, tax incentives, and the ability to tie capital expenditures to efficiency gains. Without these products and incentives, realizing a supportive business case will continue to challenge building owners.

⁸ WSP Canada Inc., *Deep Retrofit Accelerator Initiative Technologies and Skills Memo*, prepared for the Southern Alberta Institute of Technology (2025).

https://www.enbix.ca/wpcontent/uploads/2025/09/2025.08.22_SAIT_WSP_TechSkills_Memo_Final-4.pdf

Skilled experts

Skilled and ambitious experts are needed not only to facilitate more retrofits but to also ensure those retrofits perform at a high level. All retrofit roles face capacity challenges including: program administrators, permitting and inspection staff; lenders, financing partners, insurers, underwriters, and appraisers; contractors, tradespeople, architects, and engineers; and building owners and operators. The complex nature of retrofitting requires cross-sectoral upskilling to ensure projects maintain momentum and reach higher levels of performance.

Leadership

Strong leadership — from building owners, project managers and governments — is a key factor enabling whole-building retrofits. The projects within this report progressed under the direction of key leaders who ensured momentum continued. To further enable retrofits at scale, leadership is needed beyond these select few building owners. The stop-start cadence of government rebate and loan programs has created uncertainty in the retrofit sector. The federal electricity strategy, supporting the retrofit of one million Canadian homes, is a welcome policy change that helps boost market confidence, although more leadership is needed to spur investments in upskilling.

Conclusion and future research

Existing market conditions have enabled a growing collection of retrofitted buildings in Alberta, with more coming online every year.⁹ Whole-building retrofits in Alberta are no longer theoretical, but their success depends on the alignment of timing, financing, leadership, and skilled expertise. Delivering retrofits at scale requires coordinated support that make retrofits easier to plan, finance and deliver. Upcoming case studies will provide deeper insight into how these successful projects moved from ambition to implementation.

Acknowledgements

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⁹ Michelle Hauer and Kate Woloshyn, "Showcasing large building retrofit projects in Alberta," *ENBIX*, April 20, 2026. <https://enbix.ca/building-retrofit-projects-in-alberta/>



Photo: Alberta Ecotrust

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