



# Barriers to Emissions-Neutral Buildings in Alberta

Alberta Ecotrust Foundation's findings from the Emissions-Neutral Buildings Information Exchange (ENBIX) initiative.

April 2026

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# Executive summary

This report, compiled by [Alberta Ecotrust Foundation](#), outlines learnings from the Emissions-Neutral Buildings Information Exchange ([ENBIX](#)) initiative and the barriers residential builders face in constructing high-performance, emissions-neutral buildings in Alberta. This report also explores efforts being made in Alberta to help reduce or mitigate these barriers.

The research, initiated in April 2025, involved workshops with eight large-volume residential builders in Calgary and Edmonton, focusing on cost, constructability, and the implementation of innovative technologies. Consultations with the City of Calgary and Edmonton also informed the findings.

**Four primary barrier themes were identified:** Innovative technology implementation and use, market and economic factors, regulation and permitting, and training and education.

Within these themes, barriers were prioritized for further exploration based on their impact and feasibility of removal. The barriers prioritized in this report include:

- A lack of clear pathways for innovative product approvals
- Inconsistent permitting processes for high-performance buildings
- Significant training gaps for both industry trades and municipal staff regarding new materials and technologies.



# About ENBIX

The Emissions-Neutral Buildings Information Exchange (ENBIX) is a collaborative initiative of Alberta Ecotrust Foundation that connects Alberta's building industry, shares practical knowledge, and provides resources to support the transition to more energy-efficient and higher-performing buildings. The initiative is possible due to funding from the City of Calgary, City of Edmonton, Government of Canada, RBC Foundation and Peter Gilgan Foundation.

## Research

### Purpose

Through discussions with industry members, it was identified that builders are encountering barriers that prevent or slow down the construction of high-performance buildings. There are competing priorities and considerations in the building industry, including housing supply, affordability, labour shortage, and economic uncertainty. This research aims to explore and share the specific barriers faced by the industry, provide information about initiatives available to help remove or mitigate these barriers, and facilitate discussion and engagement to make high-performance construction easier within a complex building environment.

Alberta Ecotrust's ENBIX initiative was supported and designed with industry, to support industry, positioning it well to lead this research.

### Method

This research was initiated following a suggestion from a member of the ENBIX Executive Advisory Committee, who noted that the ENBIX initiative could play a key role in bridging the gap between residential builders and those who could help remove or reduce the barriers to emissions-neutral building practices, including municipal governments.

To inform the research, a group of residential builders was selected for their direct experience and understanding of the barriers to building high-performance, along with their openness to collaborate. These builders were identified as key parties who could provide meaningful insight into current barriers and help explore practical resolutions.

The following builders were invited to workshops that were facilitated by Alberta Ecotrust and hosted by the regional BILD Associations in Edmonton and Calgary.

- Averton Homes
- Avalon Master Builder
- Brookfield Residential
- Cedarglen Homes
- Excel Homes
- Jayman
- Mattamy Homes
- Qualico

The research then explored and documented existing efforts underway or in development with some of the stakeholders that were identified as parties that could help reduce or remove barriers. These groups included:

- The City of Calgary
- The City of Edmonton
- The Smart Sustainable Resilient Infrastructure Association (SSRIA)
- Safety Codes Council

## **Process**

In-person workshops were held at BILD Calgary Region and BILD Edmonton Metro in April 2025 to bring together residential builders in both cities to discuss the specific barriers they face. Participants were provided with questions in advance, focusing on cost, constructability, skilled labour shortages, and the implementation and use of innovative technology. Participants were asked to provide specific examples from each city for Alberta Ecotrust to share with the cities and other partners to discuss current and future solutions.

The full scope of this process included:

1. Consulting municipalities to understand what challenges they have identified in the development process, and helping steer discussions with the builders.
2. Hosting workshops with builders to identify barriers and potential solutions.
3. Applying a prioritization process to determine which themes and barriers to address first.
4. Meeting with key stakeholders to map how existing or planned programs address identified barriers.
5. Sharing findings through a formal report.



# Findings

The full list of barriers identified in the builder barriers workshops is in [Appendix A](#). If you'd like to see the full barrier database, contact us at [info@enbix.ca](mailto:info@enbix.ca). The raw data from this database was aggregated when builders raised identical or overlapping challenges. These barriers were refined into four primary themes:

- Innovative technology implementation and use
- Regulation and permitting
- Training and education
- Market and economic factors

## Key Barriers

A prioritization matrix was developed to assess each barrier identified in the workshops based on the impact removing the barrier could have and the estimated feasibility of doing so. It aimed to assess the complexity, duration, and support required to scale high-performance buildings for each identified barrier, and to determine which barriers should be prioritized for action. The prioritization matrix was applied to all barriers individually. Barriers that achieved a high score were prioritized to determine pathways to address or resolve them through current or new market activities.

Please contact us at [info@enbix.ca](mailto:info@enbix.ca) for a more comprehensive list of barriers, as well as the full scoring using a prioritization matrix for the barriers database.

The prioritized barriers included:

### Innovative technology implementation and use

- Innovative product and construction approvals (Calgary)
  - Builders are unclear about the guidelines and process for introducing new products or construction methods before the building permit stage, limiting early design options. Frequent engineering reviews add cost and time. Builders seek earlier engagement with the city to streamline approvals for new technologies.

### Regulations and permitting

- Building permit process for high-performance buildings (Calgary and Edmonton)

- Permits for standard builds move quickly, but high-performance projects face inconsistent timelines. [Calgary's Green Building Priority Stream](#) speeds up initial review but does not address delays in servicing or utility connections. Opportunities exist to link performance features to faster permitting and to apply lessons from past projects.
- Scope and structure of a green building priority stream (Edmonton)
  - Builders' recommendations for developing an Edmonton priority stream are based on reflections from those participating in the Calgary program. Areas for improvement on the Calgary program included more coordination across departments and expansion to include certain building types (e.g., many row homes). Land development delays add to the challenge. A clearer, tiered approach is needed to support high-performance projects from start to finish.

### **Training and education**

- Industry training gaps (Calgary)
  - Builders cited insufficient training across trades, sales teams, and site staff. Improper installation of technologies like heat pumps often leads to poor performance and misuse. Resistance to new practices, such as exterior insulation, is common. Sales teams struggle to convey the value of high-performance features because they lack the necessary technical training. Current resources lack hands-on learning and don't address the needs of different actors. There's also a disconnect between technical requirements and sales strategies.
- Municipal staff education (Edmonton)
  - Some city staff lack knowledge of new materials, technologies, and construction methods (e.g., dense glass, solar), slowing approvals. The pace of technology changes exceeds internal training capacity.
- Workforce capacity (Edmonton)
  - Trades and site workers need more education on compliance details, especially for systems like heat pumps. Certification gaps exist, and access to standardized training is limited. Disconnects between design intent and site execution remain a challenge.

### **Market and economic factors**

- Affordability and business case of high-performance building (Edmonton and Calgary)
  - Building high-performance homes currently adds costs and time to the house and permitting process for smaller builders. The long-term business case for net-zero projects is unclear to home buyers and hard to justify for builders who do not operate the buildings long-term.

- Land development costs (Edmonton)
  - Land development slows things down. Storm ponds and other infrastructure are very expensive. High-performance developments still require the same infrastructure as other homes.

## Current market activity

The following organizations provide activities that can enable high-performance construction or support the removal of identified barriers. The information below was gathered through discussions with these parties, following reflection on the barriers identified above.

### City of Calgary

- The Green Building Priority Stream
  - Description: The Green Buildings Priority Stream process begins with a preliminary consultation with the Program Coordinator, followed by a development permit application that includes a performance model and specific green building information. Once the City confirms the project meets entry criteria, it is designated as a priority file, granting it an accelerated review and dedicated staff support. The project team then works with the City to establish key review milestones and formalized performance conditions. During the building permit stage, the modelled energy performance must be confirmed by a qualified energy advisor. The process concludes with a post-construction validation of the building's actual performance through testing or benchmarking to confirm the final energy rating.
  - How it addresses a barrier(s): Promotes energy-efficient, high-performance building construction by recognizing leaders in the field, encouraging efficiency, and streamlining the permit approval process. This helps to speed up the initial review of projects.
  - See the program page [here](#).
- Southern Alberta Institute of Technology's (SAIT) Energy Code Training for the City of Calgary
  - Description: The "Building Better: Practical Applications of National Energy Codes for AB" was a complimentary in-person workshop hosted by the SAIT Green Building Technology Access Centre (GBTAC). The training focused on the evolving landscape of residential and commercial energy codes, specifically exploring Section 9.36 of the National Building Code (Alberta Edition) NECB, and their tiered approach to energy efficiency. Participants gained insights into the legislative and policy frameworks guiding the construction industry, as well as the documentation and field verification required to demonstrate compliance.

- How it addresses a barrier(s): Training provided to Safety Codes Officers, specific to energy code in Part 9 and Part 3 buildings. This training should directly impact issues with the knowledge and capacity of building code officials to help improve regulation and permitting processes.
- The Sustainable Building Guide
  - Description: The City of Calgary is developing the Calgary Sustainable Building Guide ("the Guide"). This initiative aims to set a new benchmark for sustainability, addressing the building and renovation industry's call for guidance beyond current building code minimum performance requirements and paving the way for a healthier, more resilient city. This work includes developing a new guide, internal and external engagement, performing an environmental, social, and financial impact analysis on the application of the Guide, identifying potential incentive programs that can be built using the Guide as a baseline and providing recommendations on how to integrate the Guide into future iterations of the Green Building Priority Stream and the City of Calgary's Corporate Sustainable Buildings Policy.
  - How it addresses a barrier(s): Looks to connect multiple policies and bylaws to address how sustainable goals can be met. This will help improve the general understanding of sustainable buildings, which, in turn, should reduce knowledge barriers and shorten permitting timelines. This guide helps to set up expectations and standards in advance of projects starting. This should help to reduce permitting barriers.

### **City of Edmonton**

- Streamlined permitting process for high-performance buildings
  - Description: The Edmonton Climate Resilience Planning and Development Action Plan 2024 integrates strategic climate mitigation and adaptation efforts across the city's land use planning and development continuum. One specific initiative includes updating the Zoning Bylaw to the permitting process for developments that exceed standard energy-performance tiers. The link to the plan is [here](#).
  - How it addresses a barrier(s): This could incentivize the construction of higher-performance buildings, as the industry values speed of permitting.

### **The Smart Sustainable Resilient Infrastructure Association (SSRIA)**

- Code Accelerator Fund Project
  - Description: This project aims to streamline the Alternative Solutions process in Alberta by developing a standardized set of tools and guidance documents for

low-carbon construction. The core output is a comprehensive Low-Carbon Approvals Guide that outlines step-by-step submission pathways, required engineering rationales, and code-based equivalency frameworks. To improve consistency, the project will also provide practical submission templates, checklists, and risk-mitigation tools modelled after successful municipal precedents.

- A structured online resource library will further support the industry by offering material profiles, testing pathways, and accessible case studies for non-technical audiences. These resources will be validated through real-world pilot projects, which will generate feedback from builders and authorities to refine the guidance. Ultimately, these deliverables create a repeatable framework that helps municipalities and developers navigate innovative material approvals more quickly and with greater certainty.
- How it addresses a barrier(s): The objective of this project is to reduce barriers to building code compliance and support the achievement of higher energy performance tiers of the National Building Code of Canada (NBC) through innovative energy efficiency measures and building materials that reduce carbon emissions in new construction projects. This project aims to provide options for reducing the time and effort required to get innovative technologies approved and implemented.

### **Alberta Ecotrust and the ENBIX initiative**

- Training development with industry
  - Description: Together with the Southern Alberta Institute of Technology (SAIT), BILD Alberta, and local construction associations, Alberta Ecotrust is currently piloting two training courses designed to teach the fundamentals and systems of high-performance buildings, specific to Alberta. Thanks to support from the Canadian Government through its Code Acceleration Fund, this pilot is currently being offered free of charge. These courses are designed for a broad audience, including Alberta real estate professionals, inspectors, designers, builders, and other industry professionals. The pilots will include both experienced experts and those brand new to the idea of high-performance buildings, to take these pilots and help us review them for accuracy and relevance.
  - How it addresses a barrier(s): These courses, under development for delivery in 2026, provide industry-specific training for construction professionals and include hands-on instruction. This will help to remove barriers across all sectors of the building industry, from permitting, sales, and builders, by increasing knowledge and capacity on high-performance buildings.

- Resource sharing and training development for the City of Calgary
  - Description: The City of Calgary worked with SAIT to recreate building code training sessions for 9.36 and NECB. These sessions were created to understand the legislative requirements of the energy codes and to delve deeper into permit application review and field inspections. This [link](#) provides access to sessions similar to those provided to Calgary but intended for a public audience.
  - How it addresses a barrier(s): Transferable aspects of the training developed by SAIT for the City of Calgary will be shared through ENBIX with municipalities that see value in providing training and skill development to their building code officials. This will help to improve the knowledge and capacity of building code officials beyond the City of Calgary and with other municipalities in Alberta.
  
- High-performance wall models and reports
  - Description: With support from the Government of Canada's Code Acceleration Fund and Peter Gilgan Foundation, Alberta Ecotrust worked with SAIT to build six wall models to demonstrate what high-performance wall construction can look like. Feedback was solicited from contractors in the province to inform the design and construction of the walls. The walls are used for in-person training sessions and at trade shows in the building industry to allow physical interaction with high-performance walls. Digital versions of these walls are available on the [ENBIX resource library page](#).
  - How it addresses barrier(s): Provides physical examples of several high-performance walls to understand constructability. The walls are also accompanied by reports, videos to guide builders through construction and energy modelling reports. These will help expedite design processes, share knowledge, and provide examples of common industry practice for builders and officials.
  
- Volta Research builder explorer modelling tool
  - Description: [The Builder Explorer Modelling Tool](#), developed with Volta Research, is a free digital tool designed to help Alberta's residential builders navigate the province's transition to a tiered energy code. It functions as a high-level strategic decision-making resource that allows users to quickly calculate the energy savings and heat loss reductions required to meet Tiers 2 through 5 of the National Building Code – 2024 Alberta Edition. Builders can input custom costs for components such as insulation and HVAC equipment to identify the most cost-effective pathways to achieve higher performance while protecting their margins. The tool illustrates how various envelope upgrades and

mechanical systems interact to impact overall building emissions and compliance.

- How it addresses barrier(s): Helps builders, designers, and trades make early design decisions for buildings by providing an opportunity to make high-level budget decisions for single-family homes and semi-detached homes. This tool is also being used by SAIT for training and skills development of industry professionals.
  
- Municipal energy code data reporting
  - Description: With funding from the Code Acceleration Fund, Alberta Ecotrust is working with multiple municipalities to collect permit application energy modelling reports. This is being completed for both Part 9 and Part 3 building types. For this project, an external consultant has been brought on to turn the modelling reports into data that can be analyzed and interpreted. The product of this work is multiple reports for municipalities on building permit energy performance, aggregated for a Provincial snapshot.
  - How it addresses barrier(s): Provides insights into the current state of construction and energy efficiency for municipalities. This helps daylight the actual performance of current designs and design characteristics at each tier of the energy code. This information can be used by municipalities to inform building code officials about what is standard and currently being built from an energy perspective in their Cities, and to support internal capacity-building efforts.
  
- Natural Resources Canada LEEP training sessions
  - Description: With funding from the Code Acceleration Fund, Alberta Ecotrust is helping to deliver LEEP training and workshops across Alberta. Workshops provided to date have been: heat pump selection training, window installation training, net-zero wall construction, and net-zero construction costing.
  - How it addresses barrier(s): This program offers practical, in-depth training specifically designed for industry professionals. The sessions focus on critical areas such as the building envelope, sizing heat pump technology, integrating solar energy systems, and comprehensive cost analysis. The goal is to equip participants with the hands-on skills and detailed knowledge necessary to excel in these specialized fields within the building sector.
  
- Getting to Zero Research Project
  - Description: The Alberta Ecotrust Getting to Zero Research Project, funded by the Cities of Edmonton and Calgary and with additional support from the RBC

Foundation and Peter Gilgan Foundation, gathers data from low or zero-emissions Part 9 residential buildings (homes, MURBs, townhouses) across Alberta. This project works with industry professionals—designers, builders, and developers—to collect performance data. The goal is to identify the most effective, affordable, and accessible emissions-reduction strategies and share these real-world insights with the industry. The program webpage is available [here](#).

- How it addresses barrier(s): A research project to create real-world examples of Tier 4 to net-zero home construction with detailed costing to be shared with the industry. This information can be used by builders to identify the most cost-effective pathways to high performance and to remove barriers to experimenting with materials and equipment.



# Conclusion & next steps

This research has identified that numerous activities are currently being developed or delivered by industry leaders to address the most common barriers to planning and constructing high-performance, emissions-neutral buildings.

For many of the prioritized barriers, work is underway to remove them. Alberta Ecotrust will continue to work with the industry to determine whether the work currently underway is sufficient to remove the noted barriers or if additional work is needed. In cases where work is required, a work plan can be developed to remove those barriers.

Alberta Ecotrust will also continue to support better building practices across Alberta by staying engaged with the parties involved in this study, learning about evolving trends, and connecting and working alongside the building industry, including offering the following through our ENBIX initiative:

- **Learning opportunities:** Events, workshops and technical training
- **Practical resources:** Tools, case studies, videos and reports
- **Knowledge exchanges:** Connecting industry to collaborate and share best practices
- **Industry insights:** Sharing knowledge on key industry issues

# Appendix

## Appendix A - Barrier summary

This is a high-level overview of the barriers identified. Please contact us at [info@enbix.ca](mailto:info@enbix.ca) for a more comprehensive list of barriers, as well as the full scoring using a prioritization matrix for the barriers database.

### Barriers identified by builders

#### Calgary

Category	Barrier	High-level barrier detail
Innovative tech implementation and use	Assembly specifications	Assembly specifications, such as defining "solar ready," need consideration of truss load capacity.
Innovative tech implementation and use	Building electric vehicle requirements	A city requiring electric vehicle readiness in multi-family buildings increases costs and impacts design & density.
Innovative tech implementation and use	Low-carbon concrete approval in municipal projects	Low-carbon concrete is not allowed in municipal projects.
Innovative tech implementation and use	Innovative product approvals	Using innovative products to achieve a high-performance envelope. These products go through very slow approval processes, slowing down projects. Need a pathway to bring innovative products to the city earlier for feedback.
Market & Economic Factors	Business case for net-zero projects	The business case is not clear to home buyers for net-zero projects
Market & Economic Factors	Consumer-based Incentives	Grants for existing homes undercut developers' ability to sell innovative green products because costs are reduced for renovations but not for new green houses.
Regulation & Permitting	Performance measuring of homes with secondary suites	Difficulty measuring the performance of homes with secondary suites.

Regulation & Permitting	Development permit process for high-performance buildings	The development process for high-performance buildings is unclear, and permitting is slow.
Regulation & Permitting	Utilities 100-amp overhead line	Alberta Utility Commission's maximum investment based on a 100-amp overhead line is a limitation for projects with higher energy needs.
Training & Education	Industry training gaps	Trades are resistant to new/unknown processes. All industry parties need more training and knowledge.
Training & Education	Modelling MURB energy performance differences	Modelling for buildings that include more than one unit is not well known in industry. More training is required to improve the practice and understanding on how the data should be used when comparing buildings.

## Edmonton

Category	Barrier	High-level barrier detail
Innovative tech implementation and use	Available default assemblies and specifications	It would be helpful to have assemblies and specifications for net-zero walls. Developing unique ones and getting them approved for each project is costly and time-consuming.
Innovative tech implementation and use	Third-party verification/inspection	Lack of third-party verification and performance testing to remove final inspection or redundant engineer approval.
Market & Economic Factors	Affordability of high-performance building	Building high-performance adds costs and time to the house and permitting process for smaller builders.
Market & Economic Factors	Land development costs	Land development slows things down. Storm ponds are very expensive. High-performance developments still require the same storm ponds.
Market & Economic Factors	High-performance adoption from buyers	No internal push for high-performance buildings. The percentage of high-performance sales is low. It would be beneficial to make net-zero features opt-out rather than opt-in.

Regulation & Permitting	Scope and structure of Green Buildings Priority Stream	Scope and structure of Green Priority Stream: It is currently not connected to all departments.
Regulation & Permitting	Engineering review of tested products	Some products tested for past projects must be tested again. Processes and the approval process are slow.
Regulation & Permitting	Multiple inspectors for performance-based Inspections	Despite better construction practices, such as mid-stage blower door tests, numerous inspections are still required. And inspectors are not consistent for projects.
Regulation & Permitting	Lack of Municipal alignment	There is a lack of municipal alignment on numerous items; for example, fire rating is measured differently. This means that projects must differ for each municipality, and efficiencies are lost.
Regulation & Permitting	Industry/city engagement process	The complex and varied process for these projects necessitates some upfront design discussion with building officials, which is not built into the current permitting process.
Training & Education	Municipal staff education	Permitting staff at municipalities are not sufficiently trained in the appropriate use and approvals of high-performance building materials.
Training & Education	Workforce capacity	The workforce for building houses lacks the capacity and knowledge needed for new technology, installation, and maintenance.
Training & Education	Lack of homeowner education	Builders struggle to better educate homeowners about the benefits of high-performance homes and are concerned about being accused of greenwashing.

Supply challenges were raised for discussion, but none of the builders considered them a barrier.