



Shaping the Exchange

Establishing a platform for the exchange of knowledge around emissions neutral buildings in Edmonton, Calgary and Alberta

Developed by Alberta Ecotrust Foundation in partnership with:

The Calgary Construction Association, the City of Calgary, the City of Edmonton and their Emission Neutral Buildings Industry Advisory Group, and the Smart Sustainable Resilient Infrastructure Association.

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Executive Summary

The Cities of Edmonton and Calgary are working to be carbon neutral by 2050. The actions to achieve this goal are outlined in their climate strategies. Reducing emissions from buildings is essential to achieving their targets. The City of Edmonton Community Energy Transition Strategy states that Edmonton will “Establish an Emission Neutral Building Knowledge Exchange collaborative platform/hub that includes working with collaborators, such as post secondary institutes, on training.” Calgary’s Climate Implementation Plan (2023-2026) calls for an action to “facilitate the establishment of a centre for innovation, capacity building, and partnership to accelerate net zero emission buildings in Calgary.”

In addition to the two municipalities, many interested parties including industry and advisory groups such as the City of Edmonton Emissions Neutral Building Industry Advisory Group and Calgary Construction Association, as well as Alberta Ecotrust Foundation, acknowledge that the establishment of a centre to accelerate emissions reductions from buildings is critical to meet the climate goals of both cities.

To advance the development of this centre/platform/hub, Alberta Ecotrust Foundation, in collaboration

with the Calgary Construction Association (CCA) and Smart Sustainable Resilient Infrastructure Association (SSRIA), partnered with the Cities of Edmonton and Calgary to conduct an engagement and analysis project titled “Shaping the Exchange.”

For the purpose of the project and of this report, the working name of this centre/platform/hub is “the Exchange.” In the near future, the Exchange will be publicly branded as the Emissions-Neutral Buildings Information Exchange (ENBIX).



The “Shaping the Exchange” project included robust industry engagement including roundtable sessions, surveys and one-on-one interviews with industry leaders. The process also involved a jurisdictional scan, policy landscape review, and a thorough needs assessment and gap analysis. The engagement, research and final deliverable was informed by the work of the Cities of Edmonton and Calgary to accelerate energy savings, reduce climate risk and work toward net zero greenhouse gas (GHG) emissions by 2050.

As part of this engagement process two types of interest surfaced:

1. Enthusiastic with a willingness to support the initiative from inception as a participant and/or co-creator of the program offerings.
2. Cautious with a curiosity to better understand the Exchange concept and the benefits of investing time interacting with it.

Conversations with interested parties provided a forum to introduce the concept of an Exchange to some of the participants not familiar with similar existing centres.

The “Shaping the Exchange” process provided clarity on the services and programs the Exchange can offer based on the specific needs of the Edmonton, Calgary and overall Alberta market. It also provided an understanding of the format that could work best.

The content of this report reflects the information and feedback provided by the interested parties and industry leaders from the Edmonton and Calgary regions. Engagement participants and interested parties were invited to provide feedback on the report to ensure the report accurately reflected what they felt the Exchange should be.

This report summarizes the findings from the engagement process, as well as of the research. The report outlines the proposed operational guiding concepts for the Exchange, including eleven recommendations for governance, vision, funding models, target audiences and metrics.

Recommendations

- 1** The Exchange is needed in Edmonton, Calgary and across Alberta
- 2** A host organization is required
- 3** Establish governance and accountability
- 4** Complete visioning and strategic planning
- 5** Develop a detailed budget and financial plan
- 6** Determine staffing and organizational management
- 7** Develop a detailed program services and offerings plan and go after the quick wins
- 8** Create a comprehensive communications and marketing plan
- 9** Confirm outcomes and key performance indicators
- 10** Continuously optimize and establish an annual reporting process including fulfillment reports to funders
- 11** Connect, collaborate and celebrate

Read the full recommendations and additional considerations on page 42.

At the time of publication of this report, Alberta Ecotrust was selected as the host organization for the Exchange in Edmonton and received a contribution of \$1.7 million from the City of Edmonton. Discussions are underway to determine if Alberta Ecotrust will be the host for Calgary. Alberta Ecotrust aims to expand the Exchange to include the remainder of the province. For this purpose it's applying for additional funding from other levels of government and if successful, it will invite interested parties from across Alberta for further engagement.

Acknowledgements

Alberta Ecotrust Foundation acknowledges that our work stretches across the traditional territories of Cree, Blackfoot, Îyârhe Nakoda, Iroquois, Dene, Tsuut'ina and Ojibway/Saulteaux/Anishinaabe nations; lands that are now known as part of Treaties 6, 7, and 8 and homeland of the Métis. Our head office is located in the City of Calgary, which is home to the Calgary Elbow Metis District within the Battle River Territory.

This work was made possible through resources provided by Alberta Ecotrust's Calgary Climate Innovation Fund, the City of Edmonton and the City of Calgary.

Additional financial and in-kind supports were provided by our partners:

Calgary Construction Association

Smart Sustainable Resilient Infrastructure Association

The City of Edmonton's Emissions Neutral Building Industry Advisory Group (ENBIAG)

Special thank you to the team from British Columbia that presented for our second roundtable event:

Roberto Pecora – Director, ZEBx.

Sean Pander – Green Building Manager, City of Vancouver.

Helen Goodland – Principal, Scius Advisory Inc.

Mary McWilliam – Zero Energy/Emissions Buildings Learning Centre (ZEBLC), BCIT.





Introduction

The cities of Edmonton and Calgary are working to be carbon neutral by 2050. The actions to achieve this goal are outlined in their climate strategies. A key action both cities identified is the establishment of a collaborative knowledge sharing platform and/or a centre of innovation focused on accelerating emissions neutral buildings.

This report describes a possible Edmonton and Calgary industry-supported approach to developing, initiating, and maintaining a centre/platform/hub for the exchange of knowledge around emissions neutral buildings (the “Exchange”). The Exchange will amplify, enhance and further support work already underway across Alberta and Canada. The purpose of the Exchange is to create the conditions for the rapid scaling up of emissions neutral buildings in Edmonton and Calgary, with the ultimate goal of achieving the carbon neutrality goals of both cities and of the Government of Canada.

This report includes a summary of the engagement that was undertaken to engage with interested parties, the findings and the resulting proposed operational plan. The content of this report reflects the information and feedback provided by the interested parties and industry leaders from the Edmonton and Calgary regions. Engagement participants and interested parties were invited to provide feedback on the report to ensure the report accurately reflected what they felt the Exchange should be.

A list of commonly used industry terms as well as the acronyms of various relevant organizations is included as Appendix A “Definition and Acronyms.”

The Shaping the Exchange Project

Project Background

The Cities of Edmonton and Calgary are working to be carbon neutral by 2050. The actions to achieve this goal and adapt to a changing climate are outlined in their climate strategies. The updated Edmonton Community Energy Transition Strategy and Action Plan was approved by City Council on April 19, 2021. The Calgary Climate Strategy: Pathways to 2050 was approved by City Council on July 5, 2022.

Edmonton's Strategy identifies the opportunity to **“Establish an emission neutral building knowledge exchange collaborative platform/hub that includes working with collaborators, such as post secondary institutes, on training.”** The establishment of this platform is one of the key actions under the Strategy's Emissions Neutral Buildings Pathway.

Under its Training and Capacity Building Program Pathway, Calgary's Strategy identifies the action to **“Facilitate and support an information sharing, capacity-building and skills training centre to accelerate zero emissions new buildings and retrofits for commercial and residential buildings, in collaboration with stakeholders (e.g. industry, industry associations, businesses, skills training and employment organizations and other labour and non-profit organizations).”** The Strategy's Climate Implementation Plan, developed for the 2023-2026 budget process, lists as a priority action the establishment of a centre to accelerate net zero buildings in Calgary, similar to the Vancouver Zero Emissions Building Exchange (ZEBx).

To advance the establishment of this centre/platform/hub, Alberta Ecotrust Foundation, in collaboration with the Calgary Construction Association (CCA) and Smart Sustainable Resilient Infrastructure Association (SSRIA), partnered with the Cities of Edmonton and Calgary to conduct an engagement and analysis project titled “Shaping the Exchange.”

The “Shaping the Exchange” engagement and research project was led by Alberta Ecotrust Foundation, the Calgary Construction Association, and the Smart Sustainable Resilient Infrastructure Association. It was done with the support and participation from the Cities of Edmonton and Calgary and took place from January to June 2023.



Project Objective

The objective of the “Shaping the Exchange” initiative is to mobilize a group of leaders to champion the formation of a collaborative platform for the exchange of knowledge around emissions neutral buildings, and initiate the creation of an implementation plan that takes into consideration the unique market realities of Edmonton and Calgary. The “Exchange” is used as the working name of this collaborative platform.

The project aims to identify the industry needs, challenges and any market or regulatory gaps that exist with respect to emissions neutral buildings in Alberta. The project also aims to outline the design and delivery of potential program offerings for the first four years of the Exchange.

Shaping the Exchange Process

With the support of the Cities of Edmonton and Calgary, Alberta Ecotrust with its partners the Calgary Construction Association and the Smart Sustainable Resilient Infrastructure Association began to plan in 2022 the activities that would inform the development of a business model for an Exchange in Calgary and Edmonton.

The table below outlines the process of the “Shaping the Exchange” project:

Setting the Stage	Defining the Why and Envisioning the How	Refining the Purpose and Structure	Confirming the Approach and Activities	Submit Report
<ul style="list-style-type: none"> Review drivers, market and regulatory Understand what is possible, what has been done in other parts of the world 	<ul style="list-style-type: none"> Identify barriers, gaps and opportunities that can be addressed Determine and draft the ultimate purpose and North Star 	<ul style="list-style-type: none"> Agree on a purpose statement and key features Review partners and roles, including funding models Draft the operational structure 	<ul style="list-style-type: none"> Identify activities and format Outline mandate and deliverables for year one operations 	<ul style="list-style-type: none"> Submit report City of Calgary deliberate on recommendations Advance the recommendations outlined

The activities to shape the Exchange included literature reviews and jurisdictional scans, meetings with interested parties to brainstorm ideas, and presentations from the team behind the Zero Emissions Building Exchange (ZEBx) in Vancouver who shared their experience with the development and operations of their exchange. A summary of these activities and the findings is listed below.

Activities and Findings

Jurisdictional Scan

Scope

A jurisdictional scan which compiled information about other similar initiatives across North America and Europe was completed. The scan explored Exchanges that have been operating for greater than five years and those who have more recently formed. Four different Exchanges were evaluated in detail including interviews with representatives. Key areas explored included audience, funding, governance and structure, key activities and services provided.

Audience

The Exchanges reviewed were initially developed as a support structure for the building industry and to give local industry members a global competitive advantage. They had wide representation from the full building industry ecosystem, including research/academia, designers/engineers, investors, manufacturers/suppliers, government, builders/developers, real estate/owners, construction/trade and not-for-profit organizations.

Funding

The Exchanges were seeded with government funding but evolved to different models of funding as the Exchange progressed after years of operations. Many have a mixture of funding sources including public funding, self-driven revenue, mixed private-public funding, grant funding and/or sponsorships. A public funding component remains in most Exchanges. ZEBx, which is the only Canadian example and with nearly six years in operations, remains largely funded through public contributions.

Programs and Services

All of the Exchanges offered a wide range of services and as a core function offered education and community building resources. This includes resource libraries, events, educational materials and training. Some unique service offerings from different Exchanges included a carbon penalty calculator, hackathon, relationship brokering, high-performance building lab, and a physical convening space.

Lessons Learned

Some aspects that led to the success of the Exchanges include:

- Identifying and engaging with a broad cross-section of relevant groups.
- Partnering with diverse associations, industries, governments and organizations.
- Adapting programs and services over time to reflect the market needs. For example ZEBx included embodied carbon in addition to operational carbon in its programming.
- Prioritizing critical “pain points.” For example, a key evolution one Exchange made was to narrow their efforts and activities to only 3 - 4 specific “pain points” instead of encompassing everything related to net zero. Those points become their focus for a number of years before reassessing and shifting focus.

The full jurisdictional scan can be found in Appendix B.



Policy Summary

Scope

A climate policy summary was prepared to highlight climate and building related policy directions and actions that the Cities of Calgary and Edmonton, Government of Alberta, and Government of Canada have outlined in various policy documents. This summary focuses on policies adopted in the last two years and it is restricted to policy activities and actions related to buildings. Both mitigation and adaptation policies were included, as current thought suggests that it is most effective that these strategies are tackled in unison when it comes to buildings.

Buildings play a significant role in the climate policies that have been developed to meet climate targets. This is due to their contribution to total greenhouse gas emissions. It's important to note that the reported emissions related to energy use in buildings often do not include embodied emissions, such as those within construction materials or those generated as a result of various manufacturing processes.

The climate policy summary (Appendix C) details the policy actions for each government entity and it has been divided into regulation, incentives, and capacity building and innovation. The policy review notes actions that are planned, in progress or in development.

General policy themes

There are a number of common policy themes between all levels of government included in this policy scan.

- A focus on economic development opportunities. For instance, in Alberta, the transition to a low carbon economy will create 160,000 jobs and generate \$60 billion in GDP by 2050 (Calgary Climate Strategy). Massive investment will be required at an estimated \$1-3 billion annually.
- Collaboration and cooperation are key factors for success, and the building industry is using building exchanges around the world as a forum for collaboration.
- Urgency as noted in ambitious targets and an immediate imperative to act to limit impacts of climate change and avoid social, economic and environmental risk.
- A just and equitable transition focus, including addressing energy poverty and affordability as well as implementing plans and actions for workers and communities.

Building-specific policy themes

The policy scan highlighted a number of building-specific policy themes. A key theme was high performance new construction, including a tiered building code, building labeling, embodied carbon reporting, electric vehicle (EV) readiness, and standardization. Energy efficiency in building retrofits was noted, such as large-scale retrofit deployment, building labeling, benchmarking and disclosure. Lastly, capacity building (such as knowledge sharing, training, and innovation hubs) was identified as a key policy theme.

The climate policy summary is provided in full in Appendix C.

Engagement and Discussions

Eight engagement sessions were organized between November 2022 and June 2023. Four sessions were for Calgary participants, three for Edmonton participants, and one joint meeting with representatives from both cities. In addition, a survey was also conducted for the Edmonton audience in order to reach more interested parties.

A summary of the engagement activities are presented in chronological order:

Activity	Initial Discussions with Emissions Neutral Building Industry Advisory Group (ENBIAG)
<p>Description</p>	<p>ENBIAG provides guidance to the City of Edmonton administration on emissions neutral buildings. This group has been championing an Exchange for many years and has supported the inclusion of the Exchange in the City’s Community Energy Transition Strategy.</p> <p>Alberta Ecotrust and ENBIAG held numerous initial discussions about developing the Exchange over the last few years.</p>
<p>Participants</p>	<p>AEEA, AltaPro, ATCO, Built Green Canada, CHBA Edmonton, EMRB, EPCOR, NAIOP Edmonton, Oasis Engineering, Rohit Group, Solar Alberta, SSRIA, Stantec Consulting, UDI, Energy Transition Climate Resilience Committee (ETCRC), Infill Development in Edmonton Association (IDEA).</p> <p><i>(For list of these and other acronyms please refer to Appendix A)</i></p>
<p>Deliverables and/or Findings</p>	<p>The ongoing work and support of ENBIAG helped develop a subsidy agreement between the City of Edmonton and Alberta Ecotrust. The agreement was signed in late 2022 and provides funding support for the initial four years of operations of the Exchange.</p>

Activity	Industry Partner Meeting #1
<p>Description</p>	<p>Industry Partner Meeting #1 was held on November 29, 2022 from 8:00 - 10:30 a.m. at the Calgary Construction Association offices. The meeting was designed for Calgary industry partners to be introduced to the Exchange concept and understand the policy rationale behind a collaborative hub for net zero buildings. Industry members were asked to inform next steps and the potential for industry partner involvement was tested.</p>
<p>Participants</p>	<p>City of Calgary Ward 12 Councillor Evan Spencer attended to give initial greetings. Participants included 20 representatives from organizations in Calgary:</p> <ul style="list-style-type: none"> • Building owners and developers (BOMA, Melcor, Minto, NAIOP, Royop, Triovest, Quadreal) • Builders and constructors (BILD, CCA) • Building sciences (CEA) • Government, NGOs (CoC, SSRIA, AEF)
<p>Deliverables and/or Findings</p>	<p>The consortium of AEF, CCA and SSRIA introduced themselves, provided a summary of policy drivers for an Exchange at all levels of government, and presented research on Exchange models around the world.</p> <p>A subsequent discussion focused on advancing the Exchange model in Calgary, and involvement and communication with interested parties. Participants raised questions about the purpose and principles of the Exchange as well as governance structure. Most questions were focused around understanding what other Exchanges have done, how the Exchange would align with existing initiatives, and helped to identify some additional interested parties such as the utilities and post-secondary institutions.</p> <p>From this meeting, Roundtable #1 was planned in Calgary to further the conversation of the functions and participant roles within a Calgary Exchange.</p>

Activity	Roundtable #1
<p>Description</p>	<p>Roundtable #1 was held on February 14, 2023 from 8:00 a.m. to noon at the Calgary Construction Association offices. This meeting was designed to lay out the key functions and design features of a future Exchange.</p> <p>The session was co-hosted by AEF, SSRIA, and the CCA and facilitated by a third party, Workforce Strategies International.</p>
<p>Participants</p>	<p>Participants included 19 representatives from:</p> <ul style="list-style-type: none"> • Building owners and developers (Minto Communities, NAIOP, Triovest) • Builders and constructors (BILD-CR, CCA) • Utilities companies (ENMAX, ATCO, Fortis) • Building sciences (CEA, SAIT) • Government, NGOs (CoC, SSRIA, AEF)
<p>Deliverables and/or Findings</p>	<p>Session participants worked individually and collectively on a future visioning exercise, imagining both a success and failure scenario of the Exchange. In a second exercise, mixed audience groups articulated constraints and risk mitigation statements for potential issues. Participants created a draft ‘North Star’ vision statement. Lastly, participants did an exercise to articulate what value they placed on different functions of an Exchange.</p> <p>Overall, the session helped build general agreement around the need for an Exchange, and participants voiced strong agreement of the word “collaboration.” However, there remained differences in opinion about scope and scaling of the Exchange, and the session identified a need to start defining a clear value proposition. After the session, 70% of participants had a better understanding of the concept of an Exchange; 61% understood why Exchanges would be beneficial; and 69% understood how Exchanges would work.</p>

Deliverables and/or Findings

(Continued)

Questions about scope and scaling as well as value proposition were identified to be in part due to a lack of clarity of what an Exchange could be. This feedback presented an opportunity to pivot the intended focus of the next roundtable to present an example of the ZEBx Exchange in Vancouver.

Activity

Roundtable #2

Description

Roundtable #2 was held online on Mar. 22, 2023 from 9:00 - 11:00 a.m. This session was designed to be an in-depth discovery session about the creation and ongoing operation of ZEBx, a building exchange started over 6 years ago in Vancouver.

The session was presented virtually in the format of a panel presentation. After the presentation, SSRIA moderated a Q&A session and a discussion which included a virtual whiteboard exercise.

Participants were then asked to complete a follow up survey to gather information on preference for focus areas.



Description

(Continued)

Participants were then asked to complete a follow up survey to gather information on preference for focus areas.

The panel consisted of:

Roberto Pecora - Director, ZEBx. Roberto shared an overview of ZEBx including their key activities and programs, who is involved, and how industry members are benefiting. Roberto has been with ZEBx since 2020.

Sean Pander - Green Building Manager, City of Vancouver. Sean spoke to why Vancouver initiated the development of ZEBx, who was involved in that process, and what role the City continues to play.

Helen Goodland - Principal, Scius Advisory Inc. Helen supported the development of ZEBx and provided insight on what audience were engaged, how they informed the development of ZEBx and their learnings from the process overall.

Mary McWilliam - Zero Energy/Emissions Buildings Learning Centre (ZEBLC), BCIT. Mary discussed development and evolution of ZEBLC and their high performance building lab, the value of the lab in delivering hands-on training, and the connection to ZEBx.

Participants

Invitations were sent to the Calgary Roundtable participants, City of Edmonton's Emissions Neutral Building Advisory Committee (ENBAG), and others from across Alberta. Participants included 34 representatives from:

- Building owners and developers (BOMA, Minto, Melcor, Rohit, Royop, Triovest, Quadreal)
- Builders and constructors (BILD, CCA)
- Utilities companies (ATCO, Enmax)
- Building sciences (CEA, SAIT, EnergSpec Energy Consulting, Williams Engineering, Stantec)
- Government, NGOs (AEEA, AEF CoC, CoE, Retrofit Canada, Solar Alberta, SSRIA)

Deliverables and/or Findings

Participants completed a whiteboard exercise during the meeting as a visual tool to gather feedback and reactions based on the presentations.

A survey was shared and completed by 18 participants after the meeting. The survey focused on identifying market barriers and how an Exchange could address those barriers, as well as identifying functions and participants' roles within the Exchange.

Participants in both the whiteboard exercise and survey mentioned lack of knowledge and awareness, risk aversion, and cost as key barriers to net zero emission buildings. Participants also noted market factors and the regulatory environment as key barriers, as well as the utility system.

Survey results place knowledge sharing as a key function of the Exchange, as well as training, case studies and workforce readiness (market research and analysis). Approximately 40% of respondents believe case studies are a priority outcome, with some noting these need to include information on cost effectiveness. Research was also mentioned by 40% of respondents with half indicating research should be related to cost and the other half on non-cost related items.

Survey respondents gave a clear message not to overlap with work done by others but to highlight that work and collaborate with those organizations. Participants cautioned including policy and code development as functions of the Exchange, and there were mixed views about advocacy.

Activity	Survey Engagement (Edmonton)
Description	ENBIAG members circulated a survey to their memberships for two weeks in May 2023.
Participants	A total of 13 participants responded to the survey. Most participants work in Edmonton or municipalities surrounding Edmonton; three represented Calgary. The majority of respondents were Builders (5) but represented a range of sectors.
Deliverables and/or Findings	<p>The survey focused on identifying key barriers and challenges in Alberta and specifically in Edmonton, as well as identifying functions of the Exchange.</p> <p>The top barriers/challenges mentioned were lack of knowledge & awareness and cost, followed by government alignment regulation.</p> <p>The most popular knowledge sharing functions were technology demonstrations and a working and steering committee (77% each), followed by case studies (69%), networking (62%), and site visits (62%). The most popular capacity building function was training (62%) followed by an equal split between research and development, technology primers, and emissions and costing studies (54%).</p> <p>The top three functions across all three functions category by responses were: market research & analysis for code adoption readiness (100%), technology demonstrations (77%), and a work and steering committee (77%) to work through specific barriers.</p> <p>Common themes mentioned in the open-response question involved knowledge sharing and awareness, but other ideas included advocacy, government and regulatory relations, market transformation, having readily available energy specialists, and third-party evaluation.</p>



Deliverables and/or Findings

(Continued)

The top response to unique aspects to Edmonton that need to be addressed is temperature (cycling extremes), though building codes, regulatory uncertainty and grid emissions were the next most frequently selected top choices.

Activity

Shaping the Exchange Luncheon (Calgary)

Description

The Calgary Construction Association held a lunch and Q&A session on May 16, 2023 noon - 1:30 p.m. Sean Pander, Manager, Green & Resilient Buildings - City of Vancouver, joined to present about ZEBx and answer questions from participants.

Participants

15 guests were invited and 7 attended, including guest Sean Pander.

- Building owners and developers (Melcor, Oxford Properties)
- Builders and constructors (BILD, CCA)
- NGO (AEF)

Deliverables and/or Findings

Sean Pander presented on the findings and successes of the ZEBx model in Vancouver.

Initial discussions regarding the primary reason for developing an Exchange were discussed and have been integrated into the report.

Activity	Roundtable #3 (Calgary)
<p>Description</p>	<p>Roundtable #3 (Shaping the Exchange - Confirming the Approach) was held in person at the Calgary Construction Association offices June 1, 2023 from 9:00 - 11:00 a.m. The purpose of the meeting was to provide Calgary participants with an opportunity for discussion and revision of the proposed approach to the Exchange.</p>
<p>Participants</p>	<p>Participants included 23 representatives from Calgary, from the following sectors:</p> <ul style="list-style-type: none"> • Building owners and developers (BOMA, Minto, NAIOP, Ronmor) • Builders and constructors (BILD, CCA) • Utilities companies (ATCO, Enmax, Fortis) • Building sciences (CEA, SAIT) • Government, NGOs (AEEA, AEF, CoC, SSRIA)
<p>Deliverables and/or Findings</p>	<p>Participants were provided a draft of this “Shaping the Exchange” report in advance of the session. They were encouraged to provide feedback directly in the document and to come to the session prepared to bring forward questions or concerns that they identified during their advanced review of the report.</p> <p>Each of the recommendations provided in this report were reviewed in detail with the group. Final changes and updates identified before and during the meeting were then integrated into the final revision of the report.</p> <p>Participants were encouraged to provide letters of support or otherwise for submission alongside the final report to Calgary.</p>

Activity	Roundtable #3 (Edmonton)
<p>Description</p>	<p>Roundtable #3 (Shaping the Exchange - Confirming the Approach) was held online June 1, 2023 from 1:00 -3:00 p.m. The purpose of the meeting was to provide Edmonton participants with an opportunity for discussion and revision of the proposed approach to the Exchange.</p>
<p>Participants</p>	<p>Participants included 18 representatives from Edmonton, from the following sectors:</p> <ul style="list-style-type: none"> • Building owners and developers (Enerspec, NAIOP) • Builders and constructors (CHBA) • Utilities companies (ATCO, EPCOR) • Building sciences (NAIT) • Government, NGOs (AEEA, AEF, CoE, Retrofit Canada, SSRIA)
<p>Deliverables and/or Findings</p>	<p>Participants were provided a draft of this “Shaping the Exchange” report in advance of the session. They were encouraged to provide feedback directly in the document and to come to the session prepared to bring forward questions or concerns that they identified during their advanced review of the report.</p> <p>Each of the recommendations provided in this report were reviewed in detail with the group. In particular, the proposed start-up schedule, governance, and budget were reviewed in detail. Final changes and updates identified before and during the meeting were then integrated into the final revision of the report.</p> <p>Final changes and updates identified during the meeting and in the document in advance of the meeting were then integrated into the final revision of the report.</p>



Needs Assessment and Gap Analysis

In close consultation with members of industry, more in-depth research was conducted in May 2023 to supplement and further explore ideas gathered during the roundtable discussions. This research aimed to better understand the barriers and gaps that exist to move towards net zero emissions targets and the immediate needs to be addressed to close the gaps. The research included a literature review and interviews with industry members that represent educational and research institutions, architecture, engineering, construction, builders, developers, consulting, government and non-profit.


The research identified both broad barriers that reflect the entire building industry and building typologies, and barriers specific to sector or field of expertise. Broad barriers are outlined and categorized into market, financial, technical, or knowledge barriers. Motivators for participating in an Exchange were described, as were the potential functions of an Exchange and recommendations on suggested key knowledge topics for immediate focus.

Recommendations from this report provide some of the initial areas of focus for the Exchange’s offerings:


Knowledge and Awareness:
The most urgent topics to focus on included economics, regulation and policy, and technical information.




Training: Working to understand existing training opportunities and areas that training can be expanded by the Exchange with a focus on air barriers, life cycle assessment, general building science, and building operations.



Research: Looking at barriers including procurement models, and legal implications related to buildings and climate resilience.



Planning: Pilots and demonstrations, and utility partner engagement with regards to electrification.



The full Needs Assessment and Gap Analysis is provided in Appendix D.

Rationale for Building Information Exchange

A Working Theory of Change

Shifting buildings to emissions neutral buildings cannot simply be completed by changing regulation or code. A change of this magnitude requires a good understanding of market realities, needed skills, targeted use of incentives and disincentives and an overall change in the construction and building ecosystem. This holistic approach needs to be supported through partnerships, innovative technology and financing, and sustainable funding. Following regulation needs to be replaced with market leadership.

The Theory of Change behind the development of the Exchange is to create an industry-directed initiative that helps to remove barriers to implementation and lead in high performance buildings rather than wait and see and merely follow regulation.

Building on and celebrating the leaders in industry while concurrently strengthening the knowledge and capacity of all industry actors such as builders, designers, engineers, manufacturers, suppliers, financiers, and trades can lead to success by creating a workforce that supports data driven advancement in building technology. The industry will inherently become advocates for emissions neutral buildings as they work with building owners. Building owners (the clients) must also be involved in the journey and the business case must make sense for work to get done.

Supporting peer-to-peer knowledge sharing of “better than regulation” building will spur on innovation and advancement. This work will allow the industry to get ahead of and inform regulation development, rather than lag behind it. The result will be increased economic development, job creation and an Alberta that is leading in the advancement towards a low carbon future.

Demand for an Exchange

The climate policy summary (Appendix C) notes that municipal partners require an Exchange to help build capacity in the building industry and ultimately meet their targets for emissions reductions in buildings.

As detailed in the Needs Assessment & Gap Analysis (Appendix D) there is significant interest from building industry members in the Exchange to fill knowledge gaps and be part of an information shar-

ing network as both contributors and receivers. Many of the research participants represented industry associations and did not see overlap with information they were already sharing or activities they were hosting related to net zero emissions (the one exception to this was in the residential single family sector where CHBA and BILD are active in sharing information about net zero emissions). Furthermore, these industry members were able to outline specific functions of an Exchange that would be useful for their work.

Throughout the “Shaping the Exchange” research and engagement, members of the building industry mentioned specific motivators for why they are already participating in emissions neutral or high performance projects or engaging in the topic, even despite the barriers that currently exist. This indicates the industry currently has an appetite to participate in and learn more about net zero building practices. This existing interest and engagement in the topic could be leveraged by an Exchange to gain widespread participation.

Some of the motivators mentioned are:

- **Corporate net zero targets or sustainability mandates:** Environment, Social and Governance (ESG) requirements are moving industry leaders towards new construction standards and improvements to existing buildings. Capital providers such as pension funds and some lending institutions are looking for low carbon outcomes as part of their investments. Some tenants look for certified buildings with high performance standards. Although these net-zero targets typically come from large national or multinational firms, awareness is rapidly building in smaller market segments as well.
- **“Getting ahead” of regulation:** With building code rapidly moving towards net zero ready building standards by 2030, industry sees value in leading. Building to higher construction standards ahead of regulation means that industry can help inform effective code for Alberta. Adopting net zero emissions building practices well in advance of code requirements also means that industry can transform and develop their own market.
- **“Getting ahead” of market demand:** For the training and educational sector, they are working to be just ahead of industry transformation so that when students enter the workforce, they have the necessary knowledge to meet the industry’s needs. For the building industry as a whole, demonstrating leadership in the market

is an important value that can act as a motivator. Also, with growing demand in the residential single family home market and escalating energy prices and carbon taxes, homebuyers’ awareness of high performance homes is increasing.

- **Market differentiation:** Many home builders and others in the industry have built their businesses’ brand as market leaders in net zero or high performance homes. It can be a market advantage to offer unique services that differentiates them from other similar companies.

Synergy with Other Provincial Markets

The demand for an Exchange is not unique to the boundaries of Edmonton or Calgary. During engagement activities, participants noted that many participants do work in areas outside of the city core and at times across Alberta. There are additional benefits to hosting the Exchange as one entity for all of Alberta rather than a stand alone operation for each city which include:

- Regulations such as energy and building code, utility systems are regulated at a provincial level not municipal.
- Many larger builders, lenders, and other participants in the building industry operate across the province and in some cases across Canada.
- An increased pool of participants allows for greater access to subject matter experts in the Alberta context.
- A single host organization for all of Alberta would allow for pooling of operational resources and the pursuit of larger funding opportunities.

There are still unique characteristics relating to the market in Calgary that would need to be acknowledged. Regardless of the “one host organization” or “multiple host organizations” approach, all program services and offerings must be place based, reflecting the market realities in whatever jurisdiction they are being offered within.

Operations

Guiding Principles

Our Goal

To accelerate building and renovation practices that lead to emissions-neutral built environments for new and existing buildings across Alberta.

Support All Building Types

We provide support for commercial and residential buildings, initially focusing on new construction while phasing in services to accelerate retrofits.

Multiple Benefits

We seek opportunities to promote multiple benefits - including climate resilience, affordability, equity and health. We explore how emissions-neutral building concepts can benefit long term housing affordability.

Industry-Led Governance

ENBIX is set up so decisions are guided by industry and reflect market realities.

Diverse Perspectives

We seek out and listen to diverse perspectives. We welcome innovation and new ways of thinking. We listen, adapt and serve the market we are in.

Amplify, Not Duplicate

Our work amplifies and elevates existing work. We don't duplicate or replace work.

Partner to Fill Gaps

Industry identifies gaps, and we work to fill them through partnerships and new initiatives. We succeed by developing solutions collaboratively.

Local Actors, Global Ideas

We welcome best practices and ideas from other jurisdictions, but our solutions are local.

Celebrating Successes

ENBIX showcases leaders, projects and initiatives. We celebrate our wins.

Sales-Free

ENBIX is committed to the free and rapid sharing of ideas. It is not a venue for marketing and sale of materials, equipment or services.

Host Organization

The Host Organization is the convening body responsible for partner assembly, audience engagement and the overall Exchange operations including financial management.

The Host Organization would provide:

- Project management and program delivery expertise
- Financial management capabilities
- Strengths in partnership building and brokering
- Administrative and operational capacity coincident with the nature and scale of the proposed Exchange
- Possess clear neutrality with no conflicts of interest while being mission aligned with the intent of the Exchange

Interested parties and the advisors from ZEBx, have suggested that an independent third party host organization who is mission-aligned but objective, not a single actor within the industry nor a government agency, would be the best fit for a host organization.

Alberta Ecotrust is the chosen host organization for the Edmonton Exchange and is working towards its launch event in fall 2023. Pending confirmation of funding from the federal government, Alberta Ecotrust intends to expand the Edmonton Exchange to cover the remainder of the province in 2023. Additional discussions are underway in Calgary to determine if Alberta Ecotrust will be the host organization for Calgary as well.



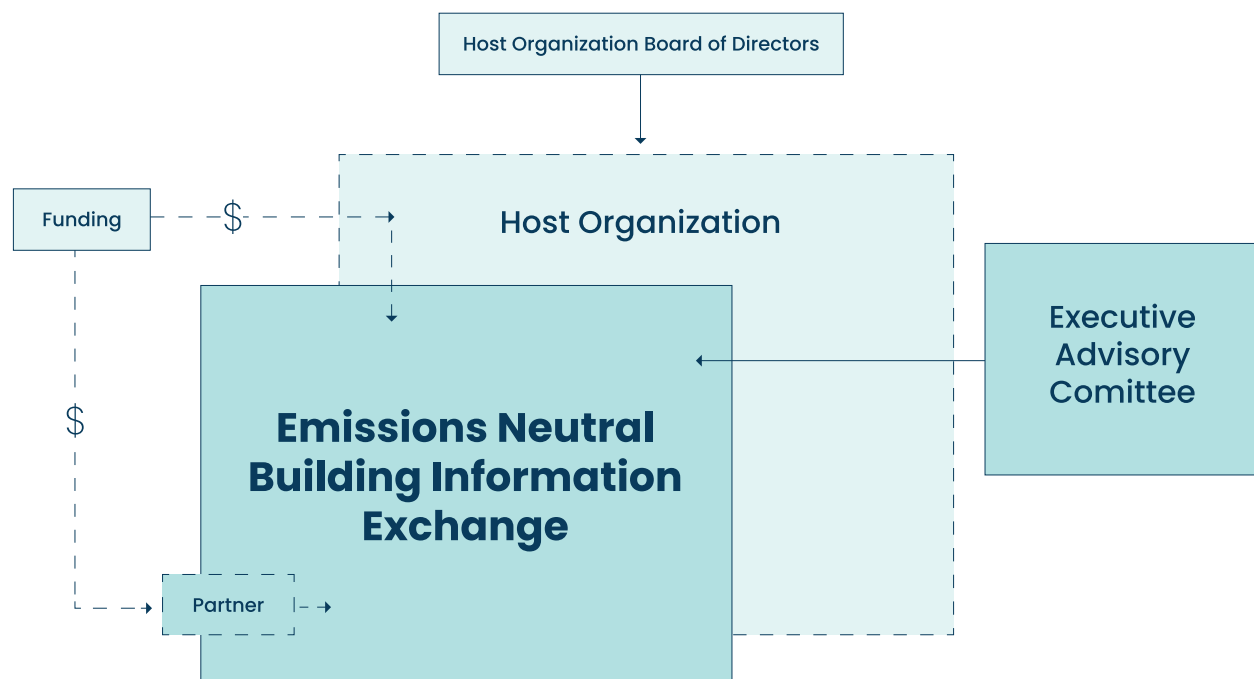


Proposed Governance Structure

The proposed governance may be modified as the structure of the host organization is confirmed.

However, key elements include:

- A division between funding and operations
- An industry-led Executive Advisory Committee that provides guidance to the Exchange's operational leadership on programming and offerings
- The opportunity for the Exchange to have partnerships in its operations outside of the host organization
- The opportunity for founding partners to provide ongoing guidance on operations through the Executive Advisory Committee



Executive Advisory Committee

The purpose of the Exchange’s Executive Advisory Committee is to provide advice to the Exchange’s Host. The Committee is responsible for advancing the strategic direction of the Exchange and providing regular progress reports to the board of directors of the host organization.

In the case that the host organization has an existing board of directors, that board will hold the ultimate oversight and accountability for the Exchange as part of the organization’s ongoing operations and commitments.

The Exchange’s Executive Advisory Committee will have:

- Diverse demographic representation.
- Representatives from the building industry in Alberta, including owners, builders, developers, suppliers, trades, trainers, and academia.
- Champions of innovation and leaders in net zero buildings including the founding partners.
- Representatives with authority to implement building code (i.e. City of Edmonton and/or Calgary)

In the future, the Committee may also include provincial representation.

Founding Partners

The founding partners of the Exchange are partners that helped to “Shape the Exchange.” These partners have been significantly involved in developing the Exchange and have worked to bring together interested parties to support development and identified key funding for the development of the Exchange.



These founding partners will continue to advise the startup and the Exchange’s initial operations as leaders in the industry. These founding partners will be welcome to hold some of the initial seats on the Exchange’s Executive Advisory Committee.

These partners in Calgary and Edmonton include the Calgary Construction Association, the Smart Sustainable Resilient Infrastructure Association, the City of Calgary, City of Edmonton and Alberta Ecotrust. However, as the Exchange is established other founding partners may be confirmed.

Funding Model and Partners

Funding partners will not have any direct operational or governance responsibilities tied to their funding. In providing funding for the Exchange, funders exercise their trust in the host organization and the Executive Advisory Committee to make decisions that are in the best interest of the Exchange.

The funding model of the Exchange is a two step approach. Public funding will be necessary to help launch the first four years of operations. Public dollars in the form of subsidies, grants and other funding will provide the base funding needed to hire staff and fully operationalize the Exchange. This also provides a runway long enough for the Exchange to begin seeking other

forms of funding including in-kind support, and even smaller one time funding options in addition to larger long term operational grants for funding beyond the first four years.

Funding partners will fall into four categories: In-kind partner support, event sponsors and smaller grant providers, non-public major funding partners, and public funders.

In-kind Partner Support

Organizations that are interested in supporting the Exchange in a non-financial capacity will be recognized for their support. The Exchange is intended to be a collaborative platform with participants providing a certain amount of peer-to-peer support and connection. Therefore not all amounts of donated time or in-kind support can or will be recognized in the same way.

In most situations the Exchange will attempt to provide recognition of participants in its activities.

However, if a partner provides significant additional in-kind time or resources these will be formally recognized. Terms for the thresholds of these contributions as well as recognition will be developed in detail within the first year of operations of the Exchange.

Event Sponsors and Specific Funding Providers

Event sponsors and smaller grant providers will provide smaller one time funding for specific purposes. Examples of such sponsorship could include direct cash contributions for events, or series of events, or funders to support a specific piece of research, training, or other individual deliverable.

Major Non-Public Funding Partners

Major non-government funding partners are those that contribute broad reaching funding that supports the overall operations or specific elements of the programming within the Exchange. In the first four years it is envisioned that the majority of large funding will come from the public sector. Once the Exchange is demonstrating value to the industry, major industry partners such as builders and developers, product manufacturers, banks, and other industry players will be approached for major contribution opportunities. However, the Exchange will need to be independent, and also represent societal decarbonization goals, and this implicitly means there will be limits to how much industry funding will be acceptable without compromising the Exchange's impartiality and mandate.

Ongoing Public Funding

The jurisdictional scan (Appendix B) highlighted the need for sustained funding for at least a portion of the Exchange's operations over the long term. The reality is that much of this work has to be done in the early days of market transformation until the practices, products, and approaches become market norms and they are fully integrated into the core business case of the industry actors. For instance, the only successfully established Canadian Exchange, ZEBx in the Vancouver area, is still largely funded through government contributions six years after its initial launch. Over time, it is anticipated that an ever decreasing proportion of funding will be required from government sources. And if the Exchange is successful there may not be a need for its ongoing operations because at some point in the future, practices will be fully aligned with the low carbon outcomes society is seeking.



Operational Summary

North Star

The “North Star” will act as a vision and mission statement for the Exchange. It will help provide clarity and direction when seeking mission-aligned opportunities in delivery of services and activities with partners.

“The Emissions-Neutral Buildings Information Exchange (ENBIX) is a collaborative platform to provide access to the training, educational, and knowledge-building materials needed to accelerate the movement toward a net-zero built environment for both new and existing buildings. ENBIX will incubate the free and rapid sharing of innovative ideas, solutions, best practices and lessons learned by a broad cross-section of interested parties in the building and construction ecosystem.”

Objectives & Service Offerings

The Exchange has three functional objectives that describe the work that it will do and one foundational objective that describes how it will operate:



1 Share Knowledge to Build Capacity

The Exchange strives to share knowledge, best practices and lessons learned. It aims to build capacity - developing and strengthening skills, abilities, and resources of individuals and organizations - within the building industry ecosystem.

Examples of how the Exchange will support sharing knowledge and building capacity:

What will the Exchange do?

What this might look like:

Host, partner, sponsor and participate in knowledge-sharing events

- Webinars
- Seminars
- Training programs
- Workshops
- “Lunch and learn” sessions
- Conferences
- Pilot projects
- Demonstrations

Gather and share knowledge across the industry, particularly through peer-to-peer networks

- Case studies
- Industry leader profiles
- Networking events
- Communities of practice

Develop and deliver curriculum and resources to training organizations and post-secondary institutions

- Training gaps analysis (*both content and geographically*)
- New or updated curriculum

Engage and communicate across the industry

- Website
- Curated resource database
- Events calendar
- Social media
- Newsletter
- Event booths



2 Foster Innovation and Leadership

The Exchange seeks new and better solutions. It aims to lead and support leaders.

Examples of how the Exchange will foster innovation and leadership:

What will the Exchange do?

What this might look like:

Identify and support removal of barriers

- Support organizations to lead initiatives to address barriers
- Lead initiatives to address barriers
- Provide analysis of solutions by providing information that is clear and comprehensive and recognizes complexities

Enable industry market development of emissions neutral buildings

- Coaching services
- Partnerships with other related market development organizations

Accelerate innovation, research, technology development, and emissions neutral building and design practices

- Develop an industry-led research question database that academia and researchers can help answer.
- Partnerships with other related innovation and research organizations
- Lead or support research activities
- Funding initiatives

Identify solutions that accelerate emissions neutral buildings while also furthering other societal, economic or environmental benefits (sometimes known as “co-benefits”) or limiting the potential negative impacts or “tradeoffs” of that solution

- View work through a lens of justice, equity, diversity, and inclusion
- Prioritize projects that create co-benefits



3 Strengthen Collaboration

The Exchange seeks new and better solutions. It aims to lead and support leaders.

Examples of how the Exchange will foster innovation and leadership:

What will the Exchange do?

What this might look like:

Support implementation of emissions neutral building policy, processes, and standards across Alberta

- Policy discussions and information sessions with industry and policy makers
- Develop a community of practice

Provide a platform for private sector experience to inform development and implementation of regulations

- Advocacy*
- Host or attend meetings and discussions
- Attend public engagement sessions
- Develop open relationships with authority having jurisdiction (AHJ)

*The Exchange will not be positioned as a lobby group to government, rather a trusted advisor sharing information and findings from industry to support policy makers

Creating spaces and forums for formal and informal dialogue to encourage relationship and trust building

- Host or support conferences
- Speaking engagements
- Public-facing booths
- Provide meeting space



4 Operational Excellence

The Exchange will optimize systems and processes, including management systems, business processes, visibility, expertise and competencies, and engagement approaches to achieve excellence in its work.

Examples of how the Exchange will achieve and maintain operational excellence:

What will the Exchange do?

What this might look like:

Be action-oriented and responsive to the needs of industry

- Engagement with interested parties
- Provide access to virtual and in-person events as required, such as access to a physical space for training and development

Secure long-term and ongoing funding for operations

- Develop and execute a fund development strategy
- Continually seeking funding opportunities from diverse sources

Integrate ongoing and continuous improvement of operations

- Determine key performance indicators and metrics in consultation with industry
- Monitor, evaluate, report, and learn from results to inform operations
- Set up process for continued revision and clarity of mandate and scope

Trusted and accountable governance

- Set up and maintain an Executive Advisory Committee

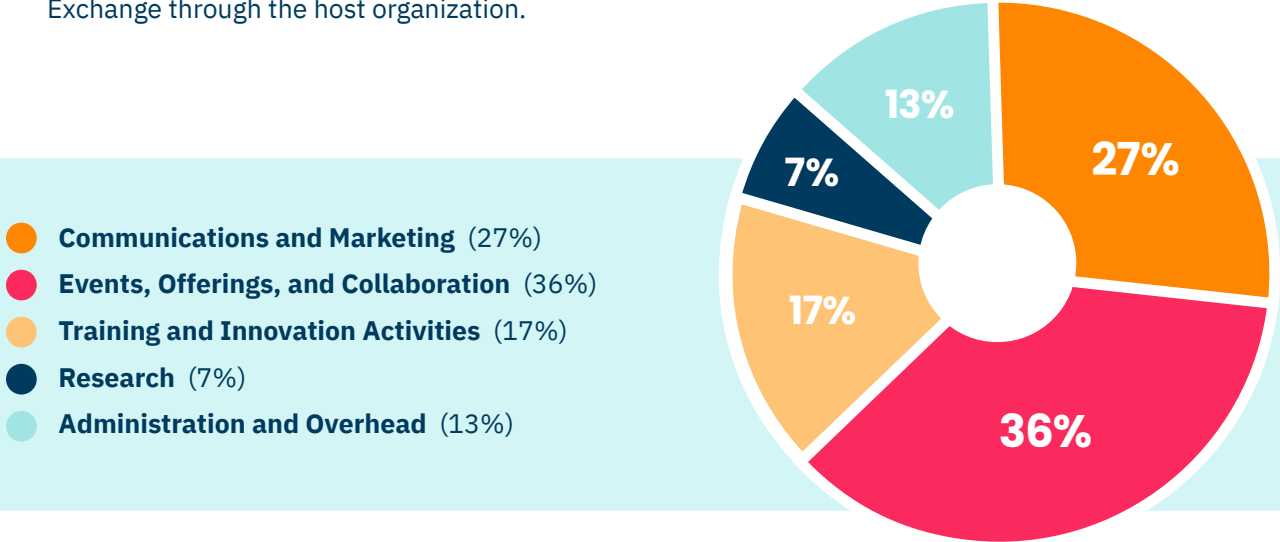
Conceptual Budget Breakdown

Initial budgeting work estimates the initial four year operational funding required to be at about \$5.5M. Approximately 75% of those funds are for programming in Edmonton and Calgary. The remainder would allow to expand services to the rest of Alberta.

At the time of writing of this report, \$1.7M in funding has been confirmed to operate the Exchange in Edmonton.

The budget can be further broken down into key areas of operations:

- **Communications/Marketing:** Website development, maintenance and management; production of marketing and educational materials, digital marketing tools such as newsletters, advertisements and paid social media promotions, among others.
- **Events, Offerings, and Collaboration:** These are host organization-led services and offerings, such as resource development, courses, events.
- **Training and Innovation Activities:** These are training events and work that supports innovation that are often led by partner organizations but that are supported by the Exchange.
- **Research:** Applied research and development to explore and validate industry questions and concerns, i.e, technology feasibility. Partnerships with industry and academic organizations may expand scope options as funding becomes more available.
- **Administration and Overhead:** Supports the operations of the Exchange through the host organization.



Conceptual Start-Up Schedule (First Year Activities – “Quick Wins”)

Objective	April–June 2023	July–Sept. 2023	Oct.–Dec. 2023	Dec.–Mar. 2024
Share Knowledge to Build Capacity	Develop a curated calendar of net zero emissions building events in Alberta that can be sorted by type and region.	Development of a resource based website that provides access to existing resources and materials that are relevant to Alberta.	Develop a few case studies of exiting projects that are completed or underway in Alberta. Participation in existing events and networks such as BUILDDEX Alberta.	Initial workshops and seminars developed and hosted in partnership with existing industry partners.
Foster Innovation and Leadership	Finalize and share Shaping the Exchange roundtables and report.	Develop partnerships with innovation supporting organizations like SSRIA.		
Strengthen Collaboration	Engage with industry through conference participation.	Develop training alliance group participant list and terms of reference. Develop partnership recognition and relationship guidelines.	Formal Exchange Launch Event. Develop a collaboration activity work plan. Formulate strategic partner plans and identify areas of collaboration.	Launch collaborative events.
Optimize Systems and Processes	Finalize Four year operational plan. Develop a resourcing plan and begin to hire staff	Finalize four year operational plan. Develop a resourcing plan and begin to hire staff. Develop a formal event and workplan to guide the programs, services, and operations. Develop comprehensive communications and marketing strategy and tactics plans. Name the Exchange, develop branding. Develop terms of reference for the Executive Advisory Committee.	Stand up for the Executive Advisory Committee Expand services and operational plans if funding is secured to expand services across Alberta	Prepare for year one review for continuous improvement Complete annual reporting requirements for funders

Conceptual Performance Indicators

Key Performance Indicators (KPIs) will be the key marker of success and therefore be determined at the level of the Executive Advisory Committee. KPIs will be measurable and include quantitative and qualitative metrics.

In addition to the core KPIs defined by the Committee, a number of indicators will be used to evaluate the success of capacity building activities. **The suggested indicators listed below will help identify successes as well as areas requiring focus in the future:**

Outcomes	Outputs
<p>Build Capacity</p> <ul style="list-style-type: none"> Develop and strengthen skills, abilities, and resources of individuals and organizations in the building sector to deliver on emissions neutral buildings. 	<p>Number of training sessions Number of panel discussions Number of workshops Number of technical tours</p>
<p>Participation and Reach</p> <ul style="list-style-type: none"> Increase participation and reach in program offerings Establish valuable peer relationships 	<p>Number of participants in activities Number of events, meetings and sessions Participant demographic information</p>
<p>Communications and awareness</p> <ul style="list-style-type: none"> Build brand awareness Build awareness of tools Increase access to resources critical in taking decision to build emissions neutral Increase receptivity to emissions neutral approach 	<p>Digital Engagement: Website views/traffic, Reference material downloads, Engagement, reach, impressions (<i>social media</i>) Engagement, reach (<i>social following, newsletter registration</i>)</p> <p>Publications and media coverage Requests for collaboration and cross-promotion from other organizations</p>
<p>Economic and Environmental Objectives</p>	<p>Economic benefits (<i>jobs, jobs supported</i>)* Number of emissions neutral buildings constructed* Constructed by participating organizations Constructed by non-participating organizations</p> <p><i>*conditional on data availability by partners</i></p>
<p>Industry engagement</p> <ul style="list-style-type: none"> Increase awareness of enabling legislation Develop conduit to regulators and foster barrier removal Increase engagement and foster confidence in pursuing emissions neutral buildings 	<p>Satisfaction survey results</p> <p>Number and types of recommendations for partners (e.g. program design, incentives, suggestions for improvements to municipal processes, future regulations.)</p>



Audience

Indigenous and Equity, Diversity, and Inclusion Considerations

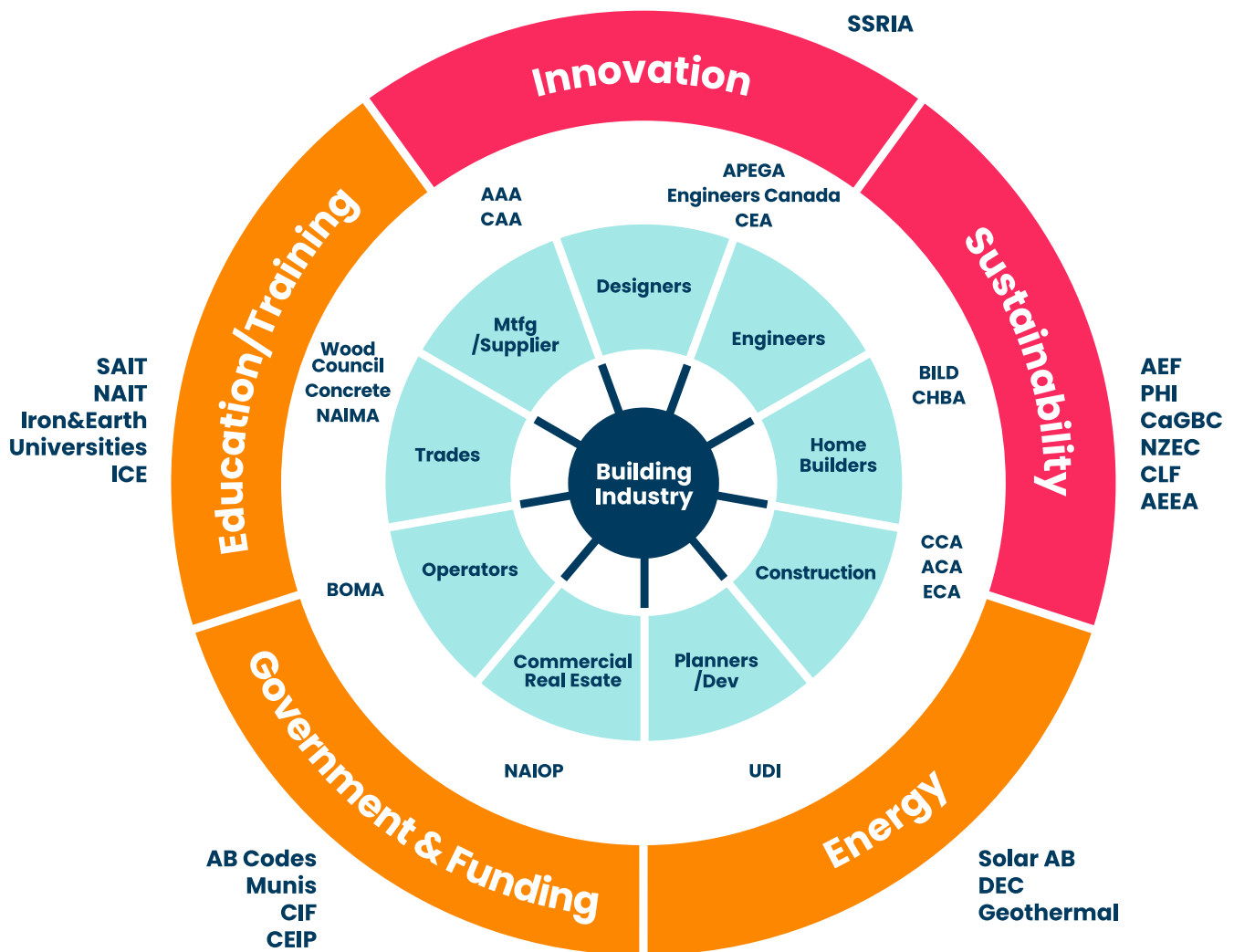
Indigenous considerations for any Exchange must be based on respect for the unique cultural, social, and environmental values of Indigenous communities and their broader understanding of sustainability. The Exchange will strive to identify and engage with interested Indigenous Nations including through training and capacity building activities.

Incorporating equity, diversity and inclusion into the Exchange requires a deliberate and intentional approach that prioritizes the needs and perspectives of underrepresented and under-resourced communities. Strategies include intentional design of activities, engaging with local organizations and community leaders, providing appropriate resources and support, collecting demographic data, and acting in the spirit of learning and continuous improvement.

Proposed Audience

The audience of the Exchange will be those who are directly involved or adjacent to the building industry. Many of the associations/organizations* identified in the image below were invited to participate in Shaping the Exchange. The audience of the Exchange will be the members of the organizations and associations identified in the blue wheel of

the image. Participants in the Calgary region noted that there would be value in expanding the reach of the Exchange to include all of Alberta, due to the arbitrary nature of municipal boundaries particularly with respect to the construction industry and its related regulation.



*Please refer to the list of acronyms in Appendix A for clarification.

Audience Engagement

The list of all organizations/associations that participated in the engagement process is provided in Appendix E.

Several audiences have been identified for future and/or expanded involvement. These audiences include industry representatives who range from being emissions neutral buildings subject matter experts to those who are new to the field. Their level of experience in the field will help determine how they can best engage with the Exchange. These audiences include:

- **Architects**
- **Commercial Real Estate**
 - Developers
 - Owners
 - Tenants
- **Designers**
- **Education and Training Organizations**
 - Post-Secondary Institutions
 - Training Groups
 - Certification Bodies
 - Professional Organizations
 - Non-Profit Organizations
- **Engineers**
 - Electrical
 - Mechanical
 - Structural
 - Energy Modelers
- **Financers and Funders**
 - Financing Organizations and Institutions Including Banks and Energy Service Companies
 - Granting Organizations
 - Insurance Companies
- **Government**
 - Policy and Regulation Developers
 - Enforcement Officers (Inspectors)
 - Planners
 - Incentive Program Designers
- **Home Builders and Construction**
 - Trades Including Both Ticketed and Non-Ticketed: Electrical, HVAC, Framing
 - Solar, Battery Designers
 - Solar, Electric Vehicle Charger and Heat Pump Installers
 - Builders
 - Energy Modelers
 - Energy Advisors
- **Planners and Developers**
 - Municipal Planners and Inspectors
 - Residential Developers
- **Quantity Surveyors**
- **Manufacturers and Suppliers**
 - Windows
 - Insulation
 - Vapor and Air Barriers
 - HVAC Equipment Manufacturers (Heat Pumps, HRV)
 - Solar and Solar-Related Providers (i.e. Module Distributors, Providers of Racking Systems, Control Panels, Tracking Devices, Connectors, EV Chargers, etc)
 - Electric Vehicle (i.e., Charging, Electrical)
 - Water Tanks
- **Operators**



Partner Organizations

An initial list of interested parties and potential partner organizations and entities has been identified through the “Shaping the Exchange” process. These include partners that may be offering complementary training, capacity building or activities. Relationships and partnerships with these organizations will be developed to determine the best way for the Exchange to amplify their related work. As the Exchange develops, the list of potential partners will expand and develop in alignment with the needs of industry and activities of the Exchange.

- **ASHRAE Southern and Northern Alberta Chapters**
- **Canadian Home Builders Association**
- **Canada Green Building Council**
- **Canada Mortgage and Housing Corporation**
- **Green Economy Canada**
- **Iron and Earth**
- **Municipal Climate Change Action Centre**
- **Smart Sustainable Resilient Infrastructure Association**
- **Southern / Northern Alberta Institute of Technology (SAIT, NAIT, numerous other Post Secondary Institutions)**
- **Sustainable Campus Collaborative**
- **Trade Winds to Success**

Recommendations

The “Shaping the Exchange” engagement, research and analysis process informed this report and laid the foundation for the operations and programming of the Exchange. This section outlines the proposed operational guiding concepts for the Exchange including recommendations for vision, governance, and funding models.

The recommendations presented below provide clarity of intent and next steps for the Exchange.

Recommendation 1

The Exchange is needed in Edmonton, Calgary and across Alberta

The engagement and analysis to date identified gaps to building emissions neutral that an Exchange can fill through the services and offerings outlined in this document. It is recommended that an Exchange be incubated as soon as possible to support government, industry and residents of Edmonton, Calgary and across Alberta.

An Exchange is needed for the **government** to accelerate adoption of higher performance standards in the building sector in a manner and time frame consistent with the goals and targets of the City of Edmonton’s and Calgary’s climate strategies. Since building and code regulations currently take place at a provincial, not municipal level, a provincial Exchange will support municipal efforts by providing access to subject matter experts, pooling of resources, and knowledge sharing.

Industry partners identified benefits to aligning the Edmonton and Calgary Exchanges with provincial efforts. An Alberta-wide Exchange would lead to efficiencies of scale while still allowing for unique programming in the two major cities. Industry partners have outlined benefits to start an Exchange now, for instance, to align with corporate sustainability mandates and to get ahead of regulation and market demand.

Finally, **residents of Edmonton, Calgary and across Alberta** will benefit from an Exchange through the opportunity to reduce emissions and adapt to climate change, as well as through the multiple benefits that higher performing buildings offer such as increased comfort, building resiliency and energy cost savings.

Additional Considerations:

Not all relevant interested parties have been engaged and further engagement and socialization of the concept of the Exchange is required, particularly outside of Edmonton and Calgary. In addition, there are some reservations as to the clarity of how the work of the Exchange will interact with existing associations and market support. A build-the-plane-as-you-fly approach will be required to be successful and strict adherence to the principles will assist in creating a successful Exchange.

The Alberta-wide Exchange makes sense from the perspective of economy of scale and efficiency.

However, there are unique regional characteristics that would need to be acknowledged. Regardless of the approach, all program services and offerings must be place based, reflecting the market realities of the jurisdiction they are being offered in.

While this provincial model is preferred there must be a method for clearly allocating funding and value to ensure funders who support specific jurisdictions, such as the City of Edmonton and Calgary, are sure that their funding is going to support Edmonton- or Calgary-based industry. Reporting structures can be designed to track and provide this information as needed.

Recommendation 2

A Host Organization is Required

A host organization will be required to operate the Exchange, which will include offering a range of programming and events, establishing a network of partners and collaborators, developing a longer-term funding strategy, and performing administrative functions. The host organization will need to act as a neutral hub for the local green buildings ecosystem and a catalyst for market transformation. The mission of the host organization must align with the goal of carbon neutrality by 2050, while objective in terms of the pathways to the achievement of this goal. The host organization is an administrator and convener but ultimately the direction and offerings of the Exchange will be set by the Executive Advisory Committee and participating parties.

At the time of publication of this report, Alberta Ecotrust is the funded host organization for the Edmonton Exchange and is working towards its launch event in fall 2023. Additional discussions are underway in Calgary to determine if Alberta Ecotrust will be the best fit host organization for Calgary as well. In addition, pending confirmation of funding from the federal government, Alberta Ecotrust intends to expand the Edmonton Exchange to include the remainder of the province in 2023.

Additional Considerations:

A particular focus or strength of the host organization will need to be communication and transparency. The host organization will need to have some experience with policy and advocacy while not being a politically charged organization. The host organization and founding members would need to be seen as credible organizations so as to help disarm any hesitancy towards participation. If the host organization is not already proficient in a specific area of work required for the exchange they should be able to build the connections to enable support for it in some way.

As host organization, Alberta Ecotrust has been socialized with the participating industry members and interested parties. Participants felt that Alberta Ecotrust fit the requirements of the host organization quite well, and it would be an efficient and effective transition for Alberta Ecotrust to take over the work after completing the Shaping the Exchange project. Efficiencies were also identified as Alberta Ecotrust is already hosting the Edmonton Exchange. However, it was noted that a new independent brand that reflects the interests of the industry should be developed.

Recommendation 3

Establish Governance and Accountability

A host organization must establish a governance structure that is inclusive and reflective of the building industry. An Executive Advisory Committee (the Committee) should be established as soon as the incubation of the Exchange is confirmed. At first this Committee would be made up of a coalition of the Founding Partners and will be expanded to include additional diverse representation. The Committee will oversee the strategic functions of the Exchange and set the direction for the program services and offerings. Committee members will also provide access to subject matter expertise, strategic market insights, and review the key performance indicators of the Exchange in an effort to continually improve its offerings.

Additional Considerations:

The members of the Committee could be phased in with a smaller group starting the work and developing many of the core requirements and “guide rails” for operations of the Exchange. However, a minimum size of the Committee should be set in order to dissuade total control for a limited few.

The Committee should leave operations to the host organization and fiscal responsibility to the

Board of Directors of the host organization. Work should be focused on providing technical expertise and industry knowledge to help shape and guide the programming of the Exchange.

Work will need to be done to clearly define the relationship between the Committee, the Board of Directors of the host organization, municipal partners, and the Exchange itself. Operational work

will also need to be clearly linked to governance. There will need to be clarity regarding the operations and roles of different “chapters” or jurisdictional focuses of the Exchange. Formal collaboration agreements between groups will be a useful tool to engage broader industry members and clarify relationships.

Establishing governance may be a stepwise process and phased in taking into account the capacity of its members. Governance should be revisited regularly to make sure that it aligns with the needs of industry.

Terms should also be set to guide a call for partners. These should be organizations that will be trusted by industry and inspire participation.

The host organization will be accountable to funders, industry and partners. Accountability must be linked to Key Performance Indicators, and these must make sense to industry partners and funders.



Recommendation 4

Complete Visioning and Strategic Planning

A detailed strategic planning process and development of an annual business plan will be led by the host organization in collaboration with the founding partners and the Executive Advisory Committee. The work done as part of the Shaping the Exchange will be used as a foundation for visioning and strategic planning. The programs, services and offerings will be further unpacked, a more detailed assessment of the needs and gaps will be conducted and a strategic plan will be produced. This strategic plan will be operationalized through an annual business plan that will guide the Exchange’s activities.

Additional Considerations:

Risk identification and mitigation should be included in strategic planning.

This work will also include further mapping of the audience of the Exchange. This should support future work to determine when and how to best engage with the audiences and what the rules or guidelines for participation will be.

The scope, focus, and reach of the Exchange needs to be defined. There may be value in including concepts like lot location and orientation as part of the emissions neutral buildings scope, as this can impact resilience and emissions reductions.

An enhanced focus and direction for integrating issues of social equity and affordability will need to be determined in strategic planning.

Recommendation 5

Develop a Detailed Budget and Financial Plan

Using the conceptual budget provided in this report as a basis, develop a detailed budget that outlines all the activities of the expenses and revenues anticipated for the Exchange over the next 3 to 4 years. In addition, a financial plan should be produced that outlines potential ways to enhance the long-term viability beyond any initial funding provided by public sources to catalyze the Exchange. This will include a combination of in-kind funding, additional public funding, philanthropic sources and corporate donations. Funding models that include revenue from the offerings of the Exchange and possibly memberships will be evaluated in this plan. The Host Organization should have expertise in fundraising to increase the potential success of raising additional funds for the Exchange.

Additional Considerations:

Budgeting and financial management will need to be tied to performance indicators. This should allow for funding partners to transparently under-

stand how their funding supports the areas of focus that they intend to fund.

Recommendation 6

Complete Visioning and Strategic Planning

Operational functions will need to be developed and deployed as soon as possible. A Program Director (existing or “first hire”) has created a preliminary staffing plan that ensures the needs of industry are met. Subsequent hires will be program staff and support staff at resourcing levels coincident with the confirmed funding. Advice will be sought from the established Executive Advisory Committee on the skill sets required. All organizational functions will be required from Information Technology, Financial Management, to Human Resources.

Additional Considerations:

Identifying which roles are unique to the Exchange versus shared with the Host Organization will be important. Communication is important enough that there should be dedicated resources within the Exchange specifically focusing on this work.

Resourcing should be completed locally in the jurisdictions where work is taking place when possible. This will facilitate local information sharing for on-site related work.

Recommendation 7

Develop a detailed program services and offerings plan and go after the quick wins

Initial ideas for the types of programming and services to be offered by the Exchange can be extracted from the notes of the industry engagement meetings and roundtables, as well as from the Needs Assessment and Gap Analysis. The program and services offering plan will be developed to be opportunistic in identifying, supporting and elevating existing work, events, and information available while also providing new materials and services to meet industry needs. The plan will be designed in a manner that allows industry feedback to provide corrective or conformational guidance on programming for the following years.

“Quick wins,” or services and offerings that are anticipated to be achievable in the first year of operation, should be the first actions taken by the Exchange. Quick wins will effectively launch the Exchange in a timely manner. The actions identified will create momentum, show value to all members of the building ecosystem, and provide opportunities for meaningful initial feedback from industry members to guide future years’ operations.

Additional Considerations:

When moving forward with quick wins be careful not to focus too much on items that are considered “urgent” and might not be as “important”. The long term intent of the Exchange should be considered. Transformation of the industry over time should not be compromised for quick success.

Other considerations include:

- Time is of the essence to achieve net zero goals, sharing and promoting existing resources is an important first step.
- Program offerings should consider the most effective moments of intervention in the building retrofit and maintenance processes.
- “Innovation” should include financial and business models in addition to technology.
- Embodied carbon in the built environment is an emerging issue/opportunity that should be embraced by the Exchange.



Recommendation 8

Create a comprehensive communications and marketing plan

With so many diverse individuals and organizations involved in the building ecosystem it is essential that a broad and comprehensive communications and marketing plan is developed in the first year of the Exchange's activities. This plan, driven by a trained communications professional and supporting staff, will aim to effectively and regularly communicate with those involved to date, attract and retain new members, and broadly promote the Exchange. Importantly, a marketing and communications plan will use branding and messaging that resonates with the building industry to gain trust and garner participation. The plan will also guide the launch of the Exchange and associated engagement events.

Additional Considerations:

The importance of ongoing and effective communication cannot be overstated. Resources for this work should be thought through.

It's important to define and understand the intended target audiences. Assessing industry members' values will be important to understand and use the correct language and communication tools. Consider using systematic approaches like social mar-

keting to address barriers. It's also important to understand and plan for how to engage with industry members that aren't already engaged in the area of emissions neutral buildings. Learning from other industry associations will be helpful.

The Exchange will need to be prepared to deal with sensitive or controversial issues (i.e., natural gas in major appliances) and determine how to respond.



Recommendation 9

Confirm outcomes and key performance indicators

Outcomes need to be defined and agreed upon among funding partners, host organization and Executive Advisory Committee. The host organization should take the lead on developing outcomes and indicators and should have experience in program and service evaluation and reporting.

Success should be defined and measured by the key performance indicators of the Exchange. Key performance indicators should be matched to the objectives and outcomes to evaluate the success. The metrics chosen should be meaningful, measurable and achievable.

Additional Considerations:

It is very important to get indicators right. They should be designed to be helpful for more than just funders, there should not be too many and should be both quantitative and qualitative.

Outcomes and indicators should generally align

with the requirements of the federal government so as to align with other national work. Correspondingly terminology and definitions should be clearly defined for the Exchange and should also align with those of the federal government.

Recommendation 10

Continuously optimize and establish an annual reporting process including fulfillment reports to funders

Ongoing and continuous optimization of the operations of the exchange requires review of the changing needs and gaps of industry, as well as review of the planned outcomes and key performance indicators.

The Exchange should look for opportunities to increase efficiencies in reporting and planning exercises to ensure that funding partners receive required information, and the exchange is taking time to reflect and realign programming while still being able to offer programming and services.

Additional Considerations:

Reporting should also be prepared for participants and partners who are not funding part-

ners. Demonstrating success and progress will be important for engaging with industry at large.

Recommendation 11

Connect, Collaborate and Celebrate

The concept of the Exchange is taking hold in Alberta. The Exchange is scheduled to launch in 2023, with an expanded Alberta model likely to follow in 2024.

With significant capacity building already happening through the industry associations, academic institutes and private training organizations, there is an opportunity to connect, amplify and celebrate and showcase industry leading work. While some of these activities have been identified in the early wins recommendations it must be fully ingrained into the heart of the Exchange. This collaboration should be a priority of the Exchange and will be prominent in its annual business plan.

Conclusions and Next Steps

The “Shaping the Exchange” process has provided clarity on the capacity gaps in industry and the need for an Exchange in Alberta. Alberta Ecotrust as the Host Organization is preparing to move forward with the next steps of developing the Exchange. This includes securing remaining funding, preparing for a launch event in late 2023, and moving forward on the following recommendations in preparation for that launch event:

Recommendation 3: Establish governance and accountability

Recommendation 4: Complete visioning and strategic planning

Recommendation 5: Develop a detailed budget and financial plan

Recommendation 6: Determine staffing & organizational management

Recommendation 7: Develop a detailed program services and offerings plan and go after the quick wins

Recommendation 9: Create a comprehensive communications and marketing plan

Recommendation 10: Confirm outcomes and key performance indicators

Appendix

Appendix A: Definitions and Acronyms

Appendix B: Jurisdictional Scan

Appendix C: Climate Policy Summary

Appendix D: Needs Assessment and Gap Analysis

Appendix E: Shaping The Exchange Participants

Appendix A:

Shaping the Exchange

Definitions & Acronyms

enbix

Definitions & Acronyms

Deep Retrofit – A deep retrofit usually includes reducing energy demand and switching from fossil fuels to electricity for space and water heating - to achieve 70% energy savings and 80% to 100% GHG emissions reductions (The Canada Green Buildings Strategy Discussion Paper July 2022)

Embodied Carbon – refers to the carbon emissions associated with materials and construction process throughout a building’s life cycle. (Canada Green Building Council 2022)

Emissions Neutral Building – An emission neutral building is one that is highly energy efficient and uses only renewable energy for its operations, OR produces and supplies onsite renewable energy in an amount sufficient to offset the annual greenhouse gas emissions associated with its operations (City of Edmonton Community Energy Transition Strategy and Action Plan)

High Performance New Construction – Constructed to the highest energy efficiency requirements feasible (The Canada Green Buildings Strategy Discussion Paper July 2022)

Net Zero Emissions - Refers to a state in which GHG emissions emitted into the atmosphere is balanced by the removal of GHG out of the atmosphere (Calgary Climate Strategy, 2022)

Net Zero Emissions Buildings - A building that is highly energy-efficient that produces on-site, or procures, emissions-free renewable energy or high-quality carbon offsets to counterbalance the annual carbon emissions from building materials and operations. (Calgary Climate Strategy, 2022)

Acronyms

AAA - Alberta Association of Architects

ACA - Alberta Construction Association

AEEA - Alberta Energy Efficiency Alliance

AEF - Alberta Ecotrust Foundation

APEGA - Association of Professional Engineers and Geoscientists of Alberta

BOMA - Building Owners and Managers Association

BILD - Building Industry and Land Development Association

CAGBC - Canada Green Building Council

CAA - Consulting Architects of Alberta

CCA – Calgary Construction Association

CEA - Consulting Engineers of Alberta

CHBA - Canadian Home Builders Association

COC - City of Calgary

COE - City of Edmonton

ECA - Edmonton Construction Association

EMRB - Edmonton Metropolitan Regional Board

ENBIAG - Emissions Neutral Building Industry Advisory Group

NAIMA - North American Insulation Manufacturers Association

NAIOP - Commercial Real Estate Development Association (Calgary or Edmonton)

NAIT - Northern Alberta Institute of Technology

NRCan - Natural Resources Canada

SAIT - Southern Alberta Institute of Technology

SSRIA – Smart Sustainable Resilient Infrastructure Association

UDI - Urban Development Institute

ZEBx - Zero Emissions Building Exchange

Appendix B:

Building Information Exchange

Jurisdictional Scan





Prepared for Alberta Ecotrust Foundation by the Smart Sustainable
Resilient Infrastructure Association with funding provided by the
City of Calgary.
January 2023

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INTRODUCTION

The Alberta Ecotrust Foundation (AEF) is taking the lead role in incubating a Building Information Exchange in Edmonton and Calgary. The intent is for this Exchange to be developed in partnership with building industry stakeholders so that the resulting product is optimized for the local region. To support stakeholders in the development and co-creation process, AEF in partnership with the Smart Sustainable Resilient Infrastructure Association (SSRIA) completed a jurisdictional scan and compiled information about other similar initiatives from across North America and Europe. The exchanges explored include those that have been operating for greater than 5 years and those who have been more recently formed. The key areas explored include funding, governance and structure, stakeholder types, and key activities and services provided. The intent of this research is not to select and replicate a specific model, but to provide a foundation of options to be considered in the context of the needs of the building industry in Alberta.

Four different exchanges were evaluated in detail including interviews with representatives of those exchanges. Detailed summary and comparative information is provided below of each of these exchanges. Detailed information gathered in the interviews shall be provided upon request.

An additional three exchanges were researched at a high level with only the unique features of each summarized below.

BUILDING ENERGY EXCHANGE (BE-EX)

Mandate: Accelerates the transition to healthy, comfortable, and energy-efficient buildings by serving as a resource and trusted expert to the building industry.

Summary: New York's Building Energy Exchange has a decade of experience connecting the city's real estate and design communities to energy and lighting efficiency solutions. As one of the first building exchanges, BE-Ex was also a founding center of the UN International Centers of Excellence. The initial drive to develop the exchange was to support the building industry to meet new building emissions caps through the development of educational tools and courses, and to provide a convening space to support information sharing and collaboration. BE-Ex was initially supported through New York State funding (NYSERDA) which continues to be a major sponsor for ongoing operations and grant funds for specific projects/activities. NYSERDA holds a seat on the board of directors of BE-Ex however the organization is otherwise operated independently. The other major sources of funding include two utilities (Con Edison, National Grid) and industry members. After 10 years in operation, the organization continues to actively search sponsors and build the membership revenue but is still reliant on government support. Aside from its members, BE-Ex also has numerous partnerships with other industry associations such as ASHRAE, architects' associations, Passive House groups and business accelerators.

BE-Ex's main focus is on providing the education necessary for the industry to be able to understand and meet regulatory standards. BE-Ex develops their own courses which are hosted in their physical space and also makes their space available to others (such as passive house) to host training sessions or put on events. The space also hosts informational and visual exhibits which are regularly updated to focus on different building components.

Building Energy Exchange (BE-Ex)

Location	New York City	
Founding Year	2012	
Organizational Structure	<ul style="list-style-type: none"> • Stand-alone organization • Governing board, 9 staff • Physical and virtual delivery 	
Funding	• Self-driven revenue:	Memberships and event space rentals (38 members)
	• Sponsors/Funders:	Government and Utilities
	• Grant Funding:	Project specific, one-off funding
Government Involvement	<ul style="list-style-type: none"> • State government representative on the board and ongoing operational funding • Grant program specific criteria and deliverables 	
Stakeholders	• Investors/Financial Groups	• Legal
	• Designers	• Engineers
	• Real Estate	• Research/Academia
	• Manufacturers/Suppliers	• Local and State Government
Key Programs and Services	<ul style="list-style-type: none"> • Formal information dissemination: Resource library, technical guides, policy and regulation primers, case studies • Informal information dissemination: podcast • Tools: Carbon penalty calculator • Education: Courses (technical and policy based) • Event Series: Climate Mobilization, WISE – Women in Sustainability, Beyond Zero • Exhibits, networking, and training held in the physical space • Developed Building Performance Partnership 	

BE-Ex: Resources Examples

CASE STUDY

September 30, 2022
**High Rise / Low Carbon
Partner Profile: 345
Hudson**

Deep Retrofits Retrofit Commercial

TECH PRIMER

September 6, 2022
**Tech Primer: Induction
Cooking**

Commercial Residential Data & Technology

REPORT

October 13, 2021
Heat Pump Planner

System Upgrade Residential Data & Technology

CASE STUDY

July 27, 2021
**Recladding Five
Manhattan West**

Deep Retrofits Commercial Passive House / High Performance

CASE STUDY

July 27, 2021
**Collaboration at the
House at Cornell Tech**

New Construction Institutional Multi-Family

CASE STUDY

July 27, 2021
**Comfort Driven Design
in DUMBO**

New Construction Multi-Family Passive House / High Performance

Source: BE-Ex Resource Library (filtered for Case Study, Report, Tech Primer) - <https://be-exchange.org/resources/>

BE-Ex: Examples of Courses

<p>NEW</p> <p>Passive House Construction Primer</p> <p>Ideal for contractors, tradespeople, and anyone involved in construction, this course provides a slightly more detailed introduction to Passive House principles than our classic Primer, and offers strategies for successful implementation.</p> <hr/> <p>Course Price: \$ Credits: 1.0 AIA LU HSW</p>	<p>Climate Mobilization Act Primer</p> <p>Learn about NYC's new sustainability regulations for buildings– including Local Law 97 emissions limits– along with tips for compliance.</p> <hr/> <p>Course Price: \$5 Credits: 0.5 AIA LU HSW</p>	<p>Passive House Primer</p> <p>This foundational course covers the basics of Passive House – a high-performance, low energy building standard. A great place to start for those new to Passive House, and ideal for audiences of all kinds.</p> <hr/> <p>Course Price: \$10 Credits: 1.0 AIA LU HSW</p>	<p>Passive House Module: Airtightness</p> <p>A good airtight layer keeps out pollution, pests, and allergens, and mitigates moisture and mold issues, ensuring excellent indoor air quality while dramatically cutting energy use. Learn how, in this quick introduction.</p> <hr/> <p>Course Price: \$5 Credits: 0.5 AIA LU HSW</p>
<p>Passive House Module: Insulation & Thermal Bridging</p> <p>Discover insulation materials and techniques that improve thermal comfort, cut energy costs, enhance resilience, and extend the lifespan of building components.</p> <hr/> <p>Course Price: \$10 Credits: 1.0 AIA LU HSW</p>	<p>Passive House Module: Windows & Doors</p> <p>High-performance windows and doors improve thermal comfort and save energy. This module explains how, along with tips for product selection and installation.</p> <hr/> <p>Course Price: \$10 Credits: 1.0 AIA LU HSW</p>	<p>Passive House Module: Energy Recovery Ventilation</p> <p>Passive House buildings are known for excellent indoor air quality, health, and comfort. Learn how energy recovery ventilation systems help yield these results.</p> <hr/> <p>Course Price: \$10 Credits: 1.0 AIA LU HSW</p>	<p>Buildings of Excellence: Passive House Retrofits</p> <p>Two teams from innovative, award-winning Passive House projects describe the retrofit process.</p> <hr/> <p>Course Price: \$15 Credits: 1.5 AIA LU HSW PHI</p>

ZEB-X

Mandate: Rapidly accelerate the knowledge, capacity and passion for zero emission buildings by navigating barriers, connecting the building industry to solutions and fostering innovation.

Summary: ZEB-X was Canada's first Centre of Excellence that was focused exclusively on the decarbonization of buildings. The creation of ZEB-X was initiated by the City of Vancouver who was developing a Zero Emissions Building Plan and wanted the Centre of Excellence to support industry members meet upcoming regulations. While ZEB-X started out as an information exchange just for Vancouver, they have expanded to providing support for all of BC. The Vancouver Regional Construction Association was the original host for the centre (based on the involvement of a passionate VRCA leader) but is now hosted by the Metro Vancouver Zero Emission Innovation Centre which has received a federal endowment to support Canada's large cities meet carbon reduction challenges (similar to Alberta Ecotrust Foundation in Alberta). ZEB-X's focus has also shifted from operational carbon to also include embodied carbon.

ZEB-X is a clearinghouse for educational and training programs developed by others (ie: Passive House) and create resources to disseminate information. ZEB-X has also partnered with BCIT to develop a high-performance building lab and host technology demos.

Zero Emissions Building Exchange (ZEB-X)

Location	Vancouver			
Founding Year	2018			
Organizational Structure	<ul style="list-style-type: none"> • Hosted by Zero Emissions Innovation Centre (ZEIC), federally supported LC3 for Vancouver • 7 dedicated staff 			
Funding	<ul style="list-style-type: none"> • Funders - City of Vancouver, BC Hydro, Vancity, BC Real-Estate Foundation, Private Funders 			
	<ul style="list-style-type: none"> • Grant Funding - Clean BC (specific programs and deliverables) 			
Government Involvement	<ul style="list-style-type: none"> • Support structure for the 2016 emissions reduction plan • Only seek funding that aligns with current mandate 			
Stakeholders	<ul style="list-style-type: none"> • Investors 	<ul style="list-style-type: none"> • Research/Academia 	<ul style="list-style-type: none"> • Engineers 	<ul style="list-style-type: none"> • Construction
	<ul style="list-style-type: none"> • Manufacturers/Suppliers 	<ul style="list-style-type: none"> • Government 	<ul style="list-style-type: none"> • Home Builders 	<ul style="list-style-type: none"> • Architects
Key Programs and Services	<ul style="list-style-type: none"> • Monthly webinars and discussions • Podcasts • Technology demonstrations • Building a Community of Practice • Case Studies • Design Support Playbooks 			

ZEB-X: Resources Examples



Decarb Lunch: Jan 2023, Heat Pumps for Step 5 Homes in Northern BC



ZEBx & BCIT: Tech Demo Series – The Smartflow Panel



Case Study: Orion – Real-Life Performance of a Step 4, All-Electric Building



Decarb Lunch: Nov 2022, The OSO Residential Development



ZEBx & BCIT: Tech Demo Series – Made-in-BC, High-Efficiency HRVs



Decarb Lunch: Oct 2022, UBC's Latest & Greatest: Passive House, All-Electric and Solar

Source: ZEB-X Resource Library - <https://www.zebx.org/resources/>

BUILDING INNOVATION HUB

Mandate: The Hub connects professionals and provides information and education. The goal of the Hub is to meet the current needs of the building industry while simultaneously pushing it towards the innovative solutions that we will need to build and operate high-performing buildings.

Summary: The Building Innovation Hub located in Washington DC is the newest exchange that was reviewed as part of our research. This exchange was developed as part of the Building Performance Partnerships program that was developed by New York's BE-Ex and the Institute for Market Transformation to support the development of local exchanges. The Building Innovation Hub is headquartered in Washington DC but will also be serving Virginia and Maryland. This exchange was created in response to a new building standard being released for the region and largely engaged with architects and engineers on the development. Once developed, builders, unions, and trade organizations got more involved and contractors involved on the periphery. Building Innovation Hub staff believe the two groups that were not engaged in the development of the exchange but that should have been were lenders and community groups/building users.

Building Innovation Hub

Location	Washington D.C			
Founding Year	2020			
Organizational Structure	<ul style="list-style-type: none"> • Incubating within Institute for Market Transformation (and part of Building Performance Partnerships) • 5-year plan to become an independent NFP • DC based but are a regional support hub for Maryland and Virginia 			
Funding	• Self-driven revenue:	None		
	• Sponsors/Funders:	Government and philanthropic (government funds are 3-year terms, expected to ramp down)		
	• Grant Funding:	Program specific grants		
Government Involvement	<ul style="list-style-type: none"> • Detailed work plan with government funder 			
Stakeholders	• Builders	• Construction/Trade orgs	• Architects	• Engineers
	• Manufacturers/Suppliers	• Planners/Developers	• Real Estate/Owners	• Research/Academia
Key Programs and Services	<ul style="list-style-type: none"> • Plain speak laws and regulations • Playbooks by professions • Case studies on processes (focused on best areas to invest) • Relationship brokering • Funding and financing map • Showcase leaders 			

Building Innovation Hub: Support Types and Resources Examples

The screenshot displays a user interface for the Building Innovation Hub. On the left is a large white card titled "Resources" with a purple "SEARCH OUR LIBRARY" button. To the right is a 2x2 grid of smaller cards, each with a title, a brief description, and a right-pointing arrow icon. The cards are: "Regulation Basics" (blue arrow), "Find a Vendor" (purple arrow), "Find Financing" (green arrow), and "Improve Operations" (orange arrow). Each card is separated from the others by a thin horizontal line of the same color as its arrow.

Resources

Learn what options you have to increase energy efficiency and building performance—and why it matters to the District and your business.

[SEARCH OUR LIBRARY →](#)

Regulation Basics

Get an overview of local building code updates and the Building Energy Performance Standards.

→

Find a Vendor

Learn how to get the right people for the job, including information about service procurement best practices.

→

Find Financing

Search this directory to identify incentives and financing options to support your project.

→

Improve Operations

Learn what building operations and business options reduce costs and increase net operating income.

→

Source: Building Innovation Hub - <https://buildinginnovationhub.org/>

Building Innovation Hub: Support Types and Resources Examples

**Building industry
playbook**
Get action steps for building industry professionals.

PRIORITY ACTION PLAYBOOK →

Benchmarking
Learn how to accurately benchmark and understand your building's performance.

→

Health meets energy
Make your building healthier, safer, and more efficient.

→

Electrification
Learn what you need to know about making the switch.

→

BEPS and new construction
Learn how to set performance targets that meet new regulations.

→

Source: Building Innovation Hub - <https://buildinginnovationhub.org/resource/get-started/>

BLOX HUB

Mandate: The Nordic hub for sustainable urbanization. Founded on the belief, that the challenges of global urbanization and climate change require partnerships and new ways of collaboration.

Summary: Blox HUB does not actually consider themselves to be a Centre of Excellence or Building Information Exchange however it is a Hub that many other exchanges have looked to and learned from in the development of their own exchanges. The key difference between Blox HUB and other exchanges reviewed is that their scope includes everything related to sustainable urbanization and not just buildings. Additionally, Blox HUB's central focus is on collaboration as it supports innovation and results in economic opportunities for its members and stakeholders. This focus on collaboration places a lot of emphasis on their physical space which is used by companies for office space, to host industry events, and a general informal gathering space to encourage organic collisions.

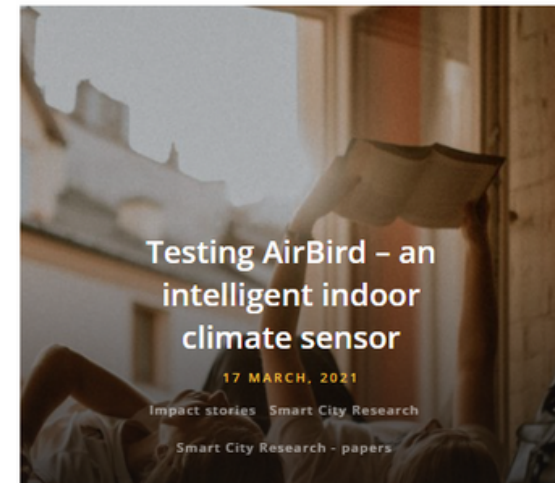
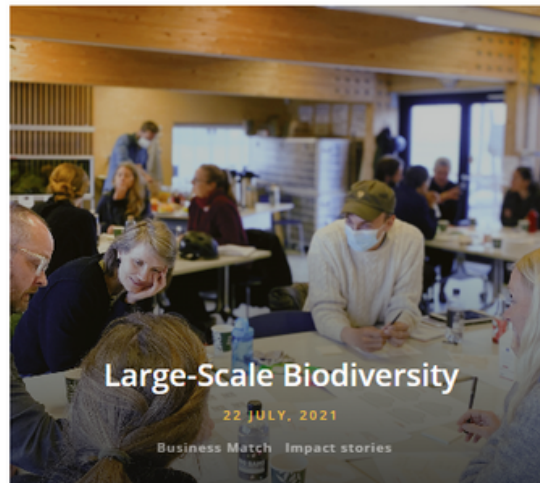
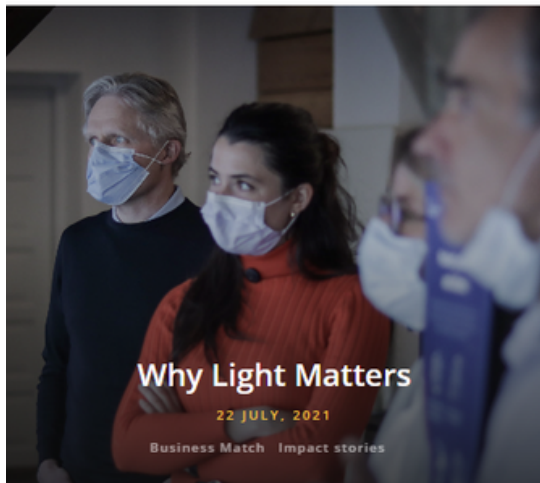
While most other exchanges were developed in response to regulation, Blox HUB was instead responding to the demand for sustainable cities and the opportunities that innovation could offer. This is reflected in the types of companies they attract which includes a greater number of innovation and technology companies. Blox HUB's funding model is also very unique since they received a 10-year endowment from a Philanthropic Real Estate organization that has allowed them to operate fully independently from government. Government (largely municipal) is however still involved in their activities just not as a funder.

A key evolution that Blox HUB has made is to narrow their efforts and activities from everything net zero related to only three to four specific "pain points" which will be their focus for a number of years before reassessing and shifting focus. Blox HUB actively works internationally through their Global Partner Match and Business Match programs which are multi-day tailored workshops to address a presented challenge.

BLOX Hub Details

Location	Copenhagen, Denmark			
Founding Year	2016			
Organizational Structure	<ul style="list-style-type: none"> • NFP governed by a board of directors • Large staff (26) • Physical space is a key tenet – includes member lounge, office space, meeting space, lab space 			
Funding	• Self-driven revenue	Office/co-working space rental (operates at break even), membership fees (400 members)		
	• Sponsors/Funders	Main funding is a 10-year grant from a philanthropic org		
	• Grant Funding	Program specific		
Government Involvement	<ul style="list-style-type: none"> • Very limited, their involvement does not drive focus of operations but rather BloxHub can be a service provider to government (specifically municipal) 			
Stakeholders	• Design/Engineering	• Construction	• Energy consulting	• Data/software/tech
	• Real Estate	• Investment	• Education/Research	• Manufacturing
Key Programs and Services	<ul style="list-style-type: none"> • Matchmaking (locally and globally) • Global delegations • Science Forums (knowledge sharing between researchers and practitioners) • AEC hackathon • Database on funding programs 			

BLOX Hub: Examples of Program Impact Stories



Source: BLOX Hub - <https://bloxhub.org/impact-stories//>

ADDITIONAL EXCHANGE EXAMPLES

The following are additional exchange examples that have similar beginnings to those presented in detail above however they also have unique features that are beneficial to highlight for consideration.

Table 5: Exchange Examples

Organisation and Location	Mission and Purpose	Unique Features
BE-ST Scotland (Built Environment-Smart Transformation)	Accelerate the built environment’s transition to zero carbon emissions this by providing connections, infrastructure and the culture needed to solve the building industry’s most pressing challenges.	Innovation Factory - that can be used for prototyping, commercialisation and hands-on training. The factory also includes meeting and event space. Learning Hub – Have developed over 30 courses that are available at no cost to participants (through partnerships with 14 different universities and colleges).
High Performance Building Alliance, Ireland	A Centre of Excellence dedicated to reducing the effects of climate change by improving the built environment.	This centre is most closely tied to government (municipal) and is the only one in the scan that was also funded by a regional education board. The HPBA was designated a UN Centre of Excellence in November 2021 however appears to have had limited activity since that time which speaks to the complexity of developing a centre of excellence based on collaboration.
Emirates GBC Net Zero Centre of Excellence, United Arab Emirates	A think tank and accelerator to advance net zero carbon buildings by providing a platform to learn and share knowledge, support future building regulations, and offer tools and resources.	The centre is hosted by the Emirates Green Building Council (GBC) which is part of the World Green Building Council. As a GBC there is a focus on building certification through the Zero carbon certification program. The single sponsor for this program is a large developer Majid Al Futtaim.

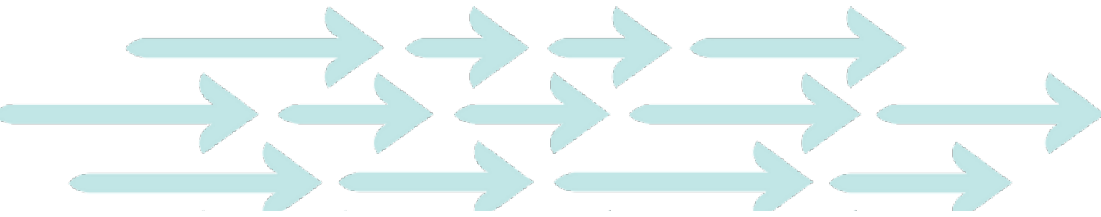
Table 6: Direct Comparison of Exchanges

ORGANIZATION	Physical Convening Space	Regional, National, or international Focus	Hosted or Independent	Is Privately Funded (companies)	Is Government Funded	Is revenue generating	Networking and Events	Training and Courses (I=Internal, E=external)	Research + Development
BE-EX	✓	N	I	✓	✓	✓	✓	✓ I+E	x
ZEB-EX	x	R	H	✓	✓	x	✓	✓ E	✓
BLOX HUB	✓	I	I	✓	x	✓	✓	x	x
BUILDING INNOVATION HUB	x	R	H	✓	✓	✓	✓	x	x
HPBA, Ireland	x	N	H	x	✓	x	✓	n/a	n/a
BE-ST, Scotland	✓	I	I	✓	✓	✓	✓	✓ I	✓
Emirates GBC	✓	N	H	✓	x	x	x	x	x

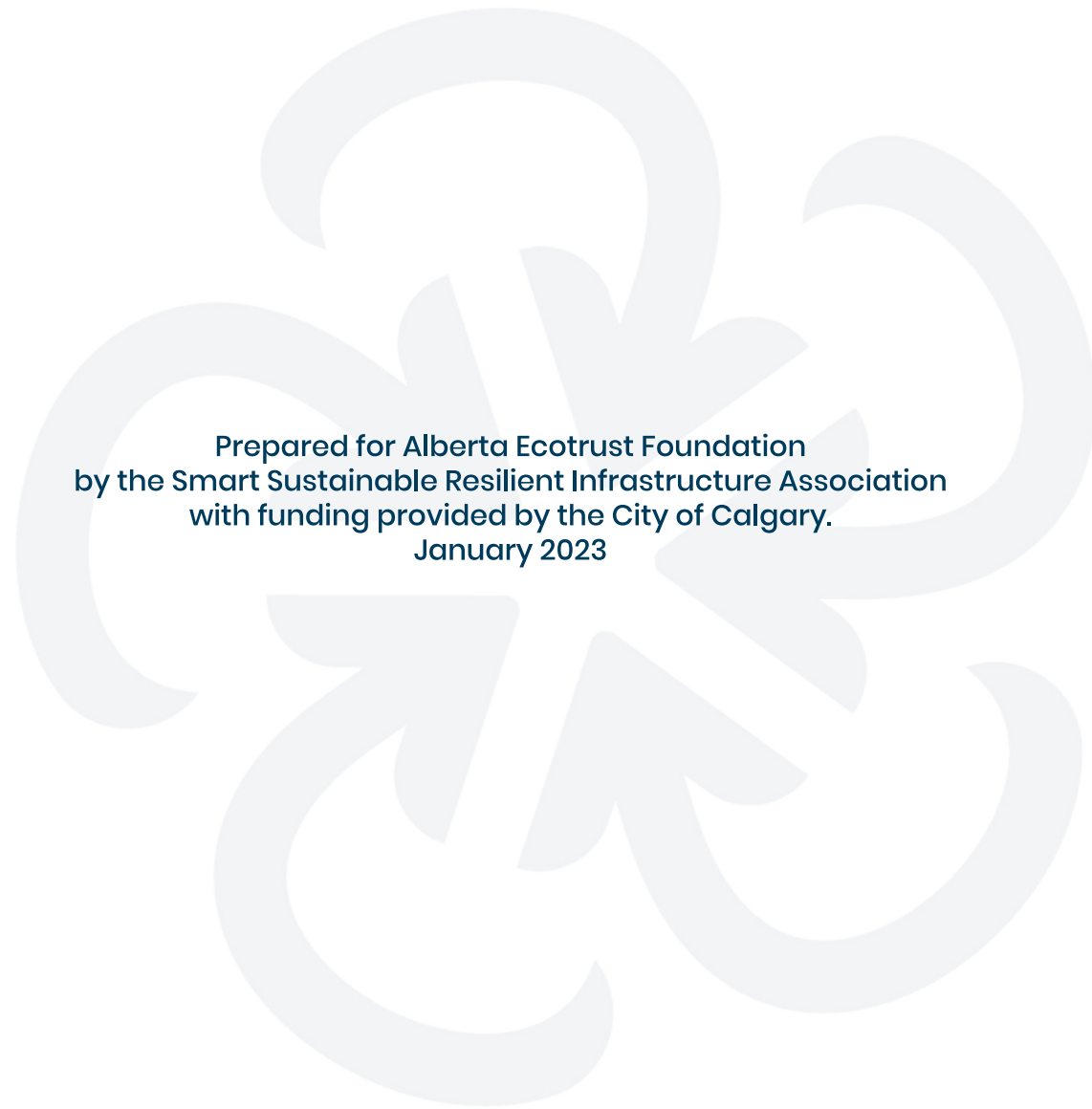
Appendix C:

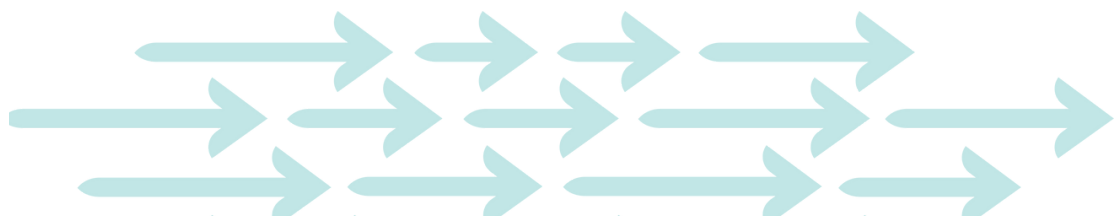
Climate Policy Summary

Preparing for a
Building Information Exchange



Prepared for Alberta Ecotrust Foundation
by the Smart Sustainable Resilient Infrastructure Association
with funding provided by the City of Calgary.
January 2023

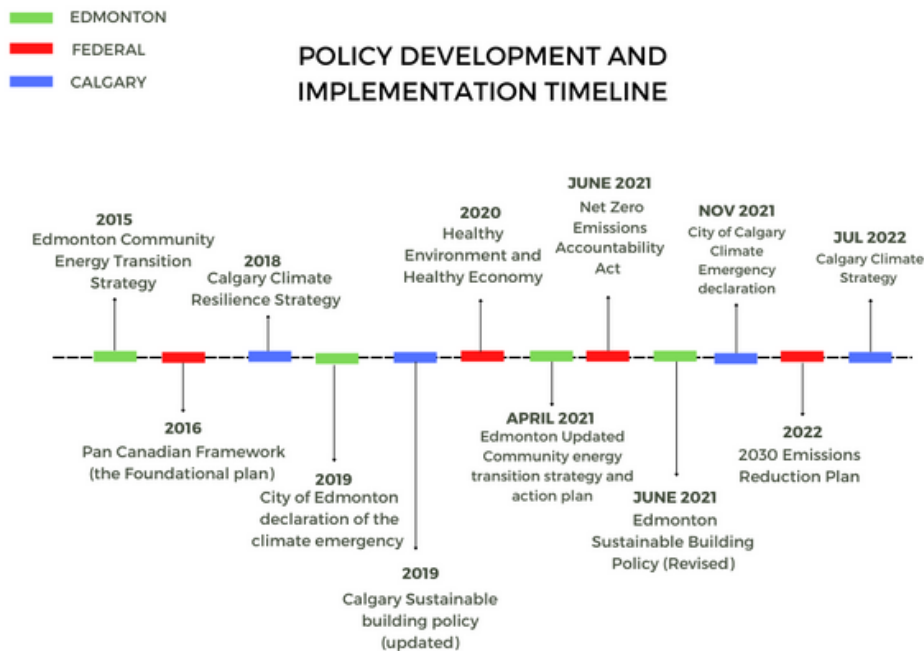




BACKGROUND

Alberta Ecotrust Foundation (AEF) is a Low Carbon Cities Canada (LC3) centre. As part of its recent strategic planning sessions, the direction has been set for AEF to take a lead role in incubating a Building Information Exchange in Edmonton and Calgary, and potentially province wide. This will require partner assembly, business planning, fundraising, community/stakeholder engagement, development and/or aggregation of program offerings, and general administration of the centre. It is very important to co-create the vision for the exchange with stakeholders and develop a shared approach that is optimized for the local jurisdiction. Understanding the why, the who, the how, and the when is critical. This Policy Summary has been developed in support of future engagement and discussion with stakeholders in the creation of the exchange, specifically providing initial context for the “why” such an initiative is needed. The policy summary will highlight climate and building related policy direction and resulting actions that the City of Calgary, the City of Edmonton, the Province of Alberta, and the Government of Canada have outlined in various policy documents or legislative activity.

Image 1 – Policy Development and Implementation Timeline





SCOPE

As seen in the timeline above, government policy activities related to current climate plans and policies date back to 2015 and beyond, however this summary will focus on those policies adopted in the last two years. While many sectors of the economy impact climate change, due to the purpose of this policy summary, its' content is restricted to policy activities and actions related to buildings. It is important to note that both mitigation and adaptation policies were considered in this summary as it is most effective that these strategies are tackled in unison when it comes to buildings.

While it is understood that additional policy documents related to climate change and policy action do exist in the selected municipal and federal governments, only those that were considered as current, and having focus on buildings or impact the building industry, have been reviewed and summarized in this document.

The Province of Alberta does not currently have a dedicated climate plan or strategy as their last plan was rescinded in 2019. In the absence of a comprehensive plan to review and include in this summary, a few key areas of legislation and funding focus areas have been highlighted in the Policy Overview.

POLICY OVERVIEW

Over 2200 jurisdictions around the globe representing a population over 1 billion people have declared climate emergencies. The Government of Canada and the cities of Edmonton and Calgary have joined countless other countries and cities as well as 3,000 businesses and financial institutions who have set Net Zero by 2050 targets to reduce their emissions in line with climate science. While the end goal of net zero emissions is the same, the trajectory to get there is reflective of the scope of influence each level of government has and the unique economies in each city.

Buildings play a significant role in the climate policies that have been developed to meet these targets due to their contribution to total greenhouse gas emissions (GHG). Canada wide, buildings account for 17% of the nation's GHG emissions, the third largest contributor behind the Oil and Gas, and Transportation sectors. In Edmonton and Calgary, Commercial and Residential buildings alone emit 38% and 57% of the respective communities GHG emissions. These percentages are only reflective of emissions related to energy use in buildings and are therefore even higher when construction materials and processes are considered.

DEFINING NET-ZERO EMISSIONS

Net-zero emissions occurs when the economy emits no greenhouse gas emissions or offsets its emissions. The emissions balance will be achieved by reducing the majority of emissions through low-carbon technology and energy systems and removing any remaining emissions through nature-based or technological solutions.

¹ All data from the CUSP energy explorer tool available at energypoverty.ca

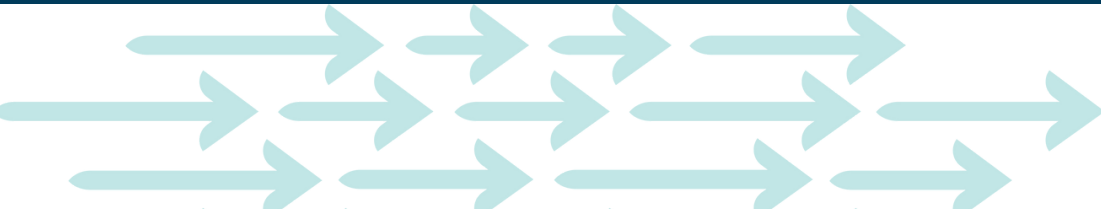
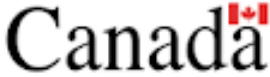




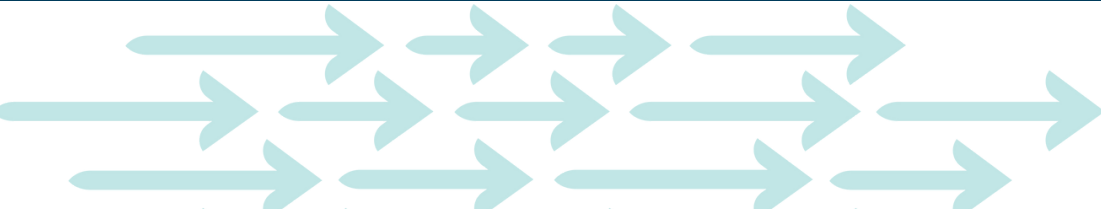
Image 2 - Net-Zero Emissions Targets

	YEAR 2030	YEAR 2050
	40-45% below 2005	Net-Zero Emissions
	50% below 2005 (35% by 2025) Reduce energy consumption by 35%/person	Net-Zero Emissions, per person (Emissions neutral corporately by 2040)
	60% below 2005	Net-Zero Emissions

COMMON THEMES

The complete comparison of policy actions for the government of Canada, Alberta, Edmonton and Calgary has been included in Appendix A. The following are the common themes in the policy documents for each entity:

1. Economic Development - All levels of government viewed their climate actions from a lens of economic potential and global leadership. This is a shift from the past narrative that the economy could not grow without increasing emissions or that emissions reduction would hurt the economy. Specific references to the economic potential from each plan include the following:



- Canada's 2030 Emissions Reduction Plan

BloombergNEF tallied global investment in the low-carbon energy transition at US\$755 billion in 2021, up 27% from \$595 billion in 2020.

As countries and businesses race toward net-zero, it is critical that Canada lead, rather than risk being left behind. To create good jobs, grow a strong economy, and build a bright, healthy future for everyone, enhanced domestic climate action is needed today.

- Edmonton Community Energy Transition Strategy and Action Plan

Globally, it is expected that tens of trillions of dollars will be invested in the transition. Edmonton businesses and industry could market, support and sell its energy transition expertise to this growing global demand.

- Calgary Climate Plan

Calgary has always been a leader in the development and provision of energy to the world and our expertise in traditional oil and gas sectors makes us uniquely positioned to provide leadership in the energy transition. In Alberta, it is estimated that a transition to a low carbon economy will create over 160,000 jobs in clean technology and generate over \$60 billion dollars in Gross Domestic Product (GDP) by 2050.

2. Investment Requirements - With the economic opportunities noted, all policies reviewed also recognized a high level of investment would be required to meet the climate targets. Calgary indicated that \$3 billion a year until 2050 would be required for all sectors of the economy while Edmonton estimates that \$180 million is required each year to address only the Emissions Neutral Building Pathway. All plans indicated that public and private investments would be required to meet climate targets.

3. Collaboration and Cooperation - In response to significant investment requirements and the need to expedite action, the need for collaboration and coordination with other levels of government and private stakeholders was emphasized in all policies reviewed.

- Federally, the plan references a "Centre of Excellence" in support of a decarbonized and climate resilient construction sector.
- The cities have created (or are in the process of developing) citizen panels and industry advisory groups in support of their climate plans, however, more directly related to the building industry, have also included action items related to collaboration with stakeholders to support information sharing and training.
 - Edmonton Community Energy Transition Strategy and Action Plan – Action 2.3

Establish an Emission Neutral Building Knowledge Exchange collaborative platform/hub that includes working with collaborators, such as post-secondary institutes, on training.

- Calgary Climate Strategy A2.1 and B2.1

Facilitate and support an information sharing, capacity-building and skills training centre to accelerate zero emissions new buildings and retrofits for commercial and residential buildings, in collaboration with stakeholders (e.g. industry, industry associations, businesses, skills training and employment organizations and other labour and non-profit organizations).



4. Just and Equitable – focus on quality of life of the citizens

- The Government of Canada has proposed legislation that would enable a just transition for workers and communities that will be impacted by a shift to a low-carbon economy.
- The Edmonton and Calgary plans both include equity and inclusiveness in the guiding principles of their plans, with the Edmonton plan including specific actions related to the development of frameworks or working groups to identify how future actions will ensure a just and equitable transition.

5. Indigenous Knowledge – Consideration for indigenous knowledge related to climate mitigation and adaptation and integration of indigenous perspectives in mitigation efforts is a foundational principle in all plans. Consideration for indigenous knowledge is directly built into the Canadian Net-Zero Emissions Accountability Act.

6. Urgency – There is an immediate imperative to act to limit the impacts of climate change and the associated economic, environmental, and social risk.

- Calgary indicates that the cost of impacts from severe climate events will be \$2.6 billion annually by 2050. This is supported by the fact that insured catastrophic losses have increased by \$1.5 billion annually (compared to the period between 1983 and 2008).
- The approach of the Edmonton plan includes an “Acceleration Approach”, recognizing the need to accelerate and scale the actions being taken to not only start to generate significant greenhouse gas emissions reductions but to also deliver economic prosperity.
- The Government of Canada references the findings of the Intergovernmental Panel on Climate Change (IPCC) and the irreversible impacts of climate change on ecosystems and humans. With Canada warming at twice the global average, there is an increasing likelihood of death from extreme heat in Canadian cities, up over 10% from 2%#.

LEGISLATED ACTION

Climate plans and policies outline the actions the governments propose to take to meet the climate targets they have set. Their legislated or regulated activities, however, further bind them and can ensure climate impacts are considered in all decision making and that new leadership follows through on climate targets including ongoing measurement to assess how the actions being taken are impacting GHG emissions. Those pieces of legislation or regulation include:

- Canadian Net Zero Emissions Accountability Act – requires the setting of 5-year national emission reduction targets and the development of science-based plans to achieve the targets. The Act and targets set are intended to promote transparency and accountability while ensuring Canada is meeting its international climate mitigation commitments.
- City of Edmonton and City of Calgary have joined over 2200 other jurisdictions to declare a climate emergency. These declarations resulted in the updating of their climate plans and emission reduction targets as well as other actions to ensure their corporate activities align with their emission reduction goals. While these declarations are unregulated commitments, they do carry international reputational significance.
- Edmonton and Calgary both have City Charters which expands their powers and authority related to GHG emissions reductions and adaptation. Both City Charters require the cities to adopt climate mitigation plans and review and update those plans every 5 years. The City Charters also give the cities the ability to implement more stringent requirements for building energy efficiency.
- The federal government has released the 2020 National Model Codes which for the first time includes energy performance tiers. It is also anticipated that the Government of Canada will publish a net-zero emissions building code and retrofit code by the end of 2024. The Province of Alberta has implemented timely code adoption which means national codes are adopted automatically 12 months after publication therefore it can be inferred that Alberta will have a net zero emissions building code by 2026–2027. The Edmonton and Calgary plan indicate they will apply increasingly rigorous building codes in alignment with federal and provincial governments.

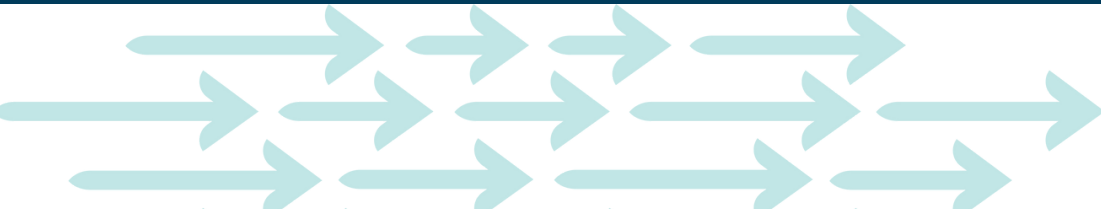
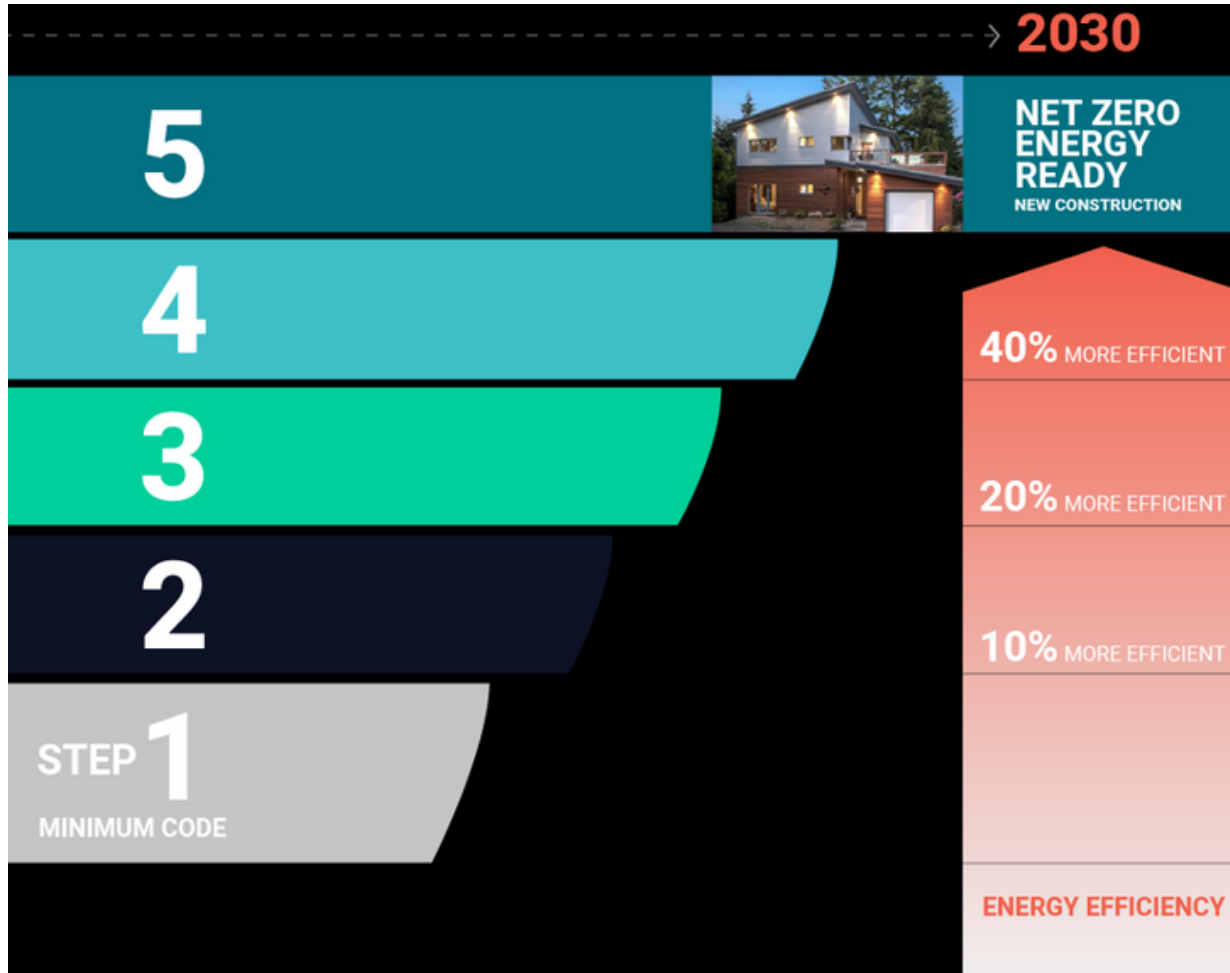
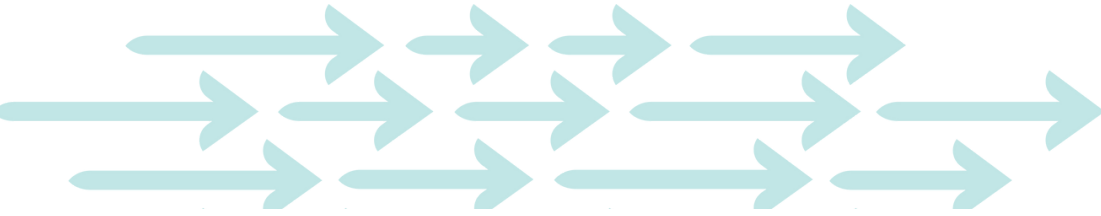


Image 3 - Tiered Model Energy Codes



Source: Efficiency Canada - 2020 Model Building Codes - <https://www.energycanada.org/building-codes-2020/>



POLICY ACTIONS

The detailed policy actions have been summarised for each government entity based on what has been shared publicly. Actions are divided into regulatory, incentives, capacity building and innovation, specifically noting actions that are in progress, in development, or that are planned (based on mentions in the most recent climate plans for each).

GOVERNMENT OF CANADA

The Government of Canada has developed several policy documents over the past 8 years starting with the Pan Canadian Framework, with each successive plan building off the previous. The building related highlights from the most recently published plan, the 2030 Emissions Reduction Plan, have been categorized and outlined below.

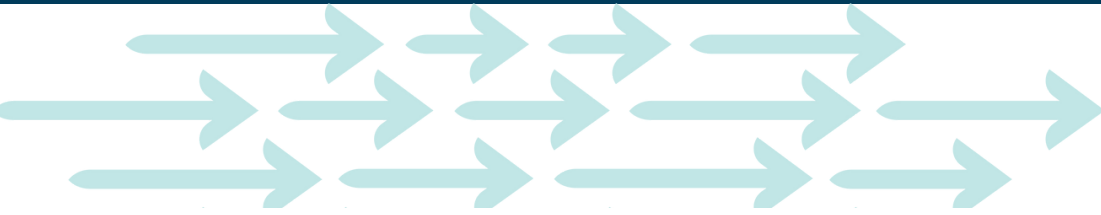



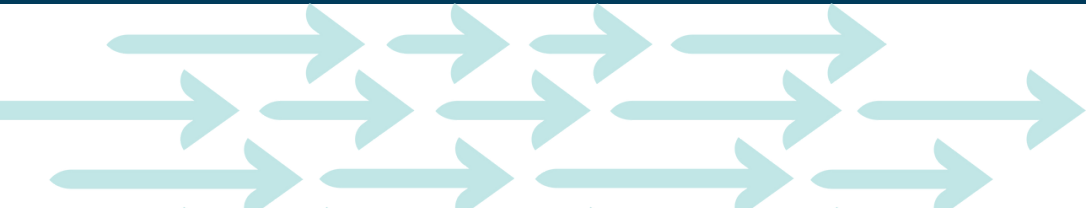
Table 1 – Short and Medium Term Policy Actions

	Regulatory	Incentives	Capacity Building	Innovation
In Progress	Increasingly stringent building code	Grants and Loans for Retrofits (residential and commercial)		
		Greener Neighborhood Pilot (accelerate)		
		Low-interest financing (large new construction projects)		
		Heat pump incentives		
Planned/Mentioned	Time of sale home labelling	Net Zero Building Code Acceleration fund for provinces and municipalities	Deep retrofit accelerator	Climate Adaptation Home Rating Program



	Regulatory	Incentives	Capacity Building	Innovation
	Transition off fossil fuels		Clean Jobs Training Centre	Innovation Hub for low carbon materials
Planned/Mentioned	New buildings to be Net Zero Carbon Ready by 2027		Training funding for Union Training and Innovation Program	
	Mandated Carbon disclosure			

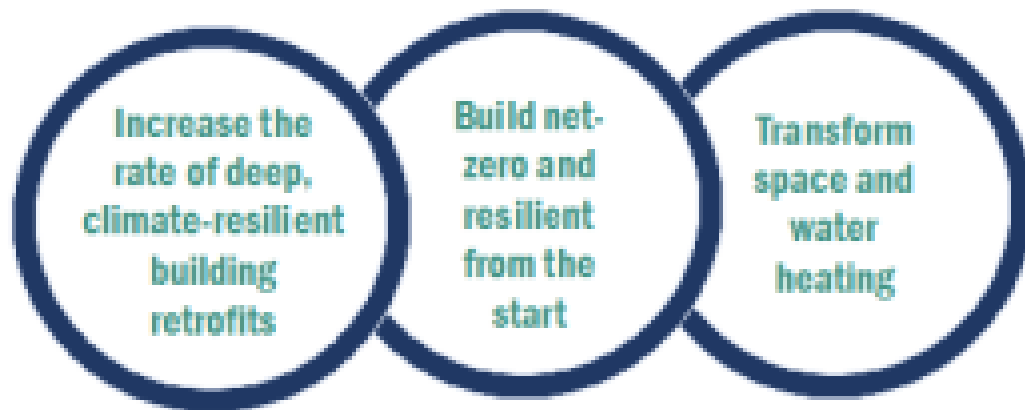
- Regulation – The federal government is responsible for the development of Model Building Codes which will be continuously updated to address operational carbon emissions for new and existing buildings (2025), life-cycle emissions (2030), and advance integration of climate resilience. The federal government has also been exploring mandatory building benchmarking and disclosure since the PanCanadian Framework was developed.
- Incentives and Financing – The federal government is providing financial support to Canadians in the form of incentives and loans to complete home retrofits. These programs utilize the EnerGuide Home Energy Labelling program and therefore lays the groundwork for future home labelling policies. There are also grant and loan programs for commercial building retrofits with the largest focus on financing for large commercial retrofit projects or an aggregation of projects (Canada Infrastructure Bank providing \$2 Billion in financing). Planned initiatives will include support for the transition off fossil fuel heating systems and a fund to support provinces to accelerate Net Zero Building Code adoption.
- Capacity Building – The focus of the federal government for capacity building is on deep energy retrofits and the accelerated adoption of net zero emission building codes. As part of the commitment to a just and equitable transition, funding has been committed for a Sustainable Jobs Training Centre and Sustainable Jobs Secretariat.
- Innovation – The development of a Low Carbon Building Materials Innovation Hub was noted in the 2022 budget and 2030 Emissions reduction plan. The focus of this hub would be research, building code reform, and demonstration activities to promote the use of lower carbon construction materials (e.g., wood, steel, cement, etc.) in the built environment



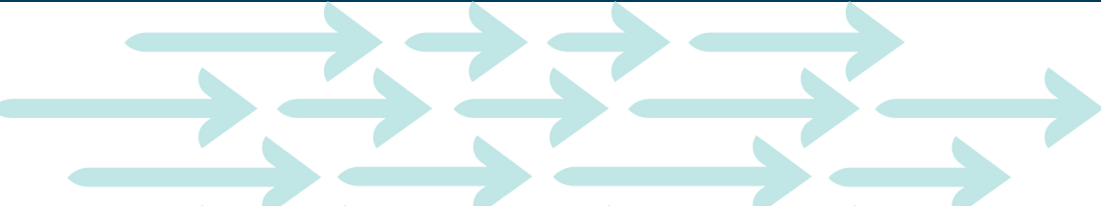
Due to the significance of the buildings sector in the overall GHG emission inventory, the Government of Canada is in the process of developing the Canada Green Buildings Strategy. This strategy is still in development and currently in the engagement phase and scheduled for release in the spring of 2023. Items of note in the strategy discussion paper were included in the above table in the “Planned/Mentioned” section.

Image 4 – The Canada Green Building Strategy - Objectives

STRATEGY OBJECTIVES



The Strategy will provide an umbrella for all GoC policy and program activities that impact the building sector to ensure strategic deployment of all investments toward its objectives. The Strategy must also mobilize action from partners (government and non-government) toward 2050.



PROVINCE OF ALBERTA

The Province of Alberta does not currently have a comprehensive strategy related to climate change and the reduction of GHG emissions. The most significant emissions reduction initiative in Alberta is the Technology Innovation and Emissions Reduction Regulation (TIER) which is a provincial GHG emission pricing and emissions trading system for large final emitters (LFE's). The funds collected from LFE's through this regulation is largely allocated to large industrial emission reduction projects, however \$30 million in funding was allocated to commercial building retrofits through the Emissions Reduction Alberta (ERA) Energy Savings for Business program. Additional provincial activities that support GHG emission reductions related to buildings are highlighted below.

- Regulation
 - The Province of Alberta is the government authority that is responsible for adopting buildings codes into regulation. It is anticipated the National Model Codes will be adopted by Alberta in early 2023 with a runway of 1-year before they come into force. It is still unknown how the performance tiers will be implemented in the Alberta edition of the Building Code.
- Incentives or Financing
 - ERA Energy Savings for Business – \$55 million in funding for commercial energy efficiency retrofits (current program end date is September 30, 2023 and funding is nearly 90% allocated)
- Capacity Building
 - The Alberta Construction Association received funding from the province to deliver a Work-Integrated-Learning program that subsidizes wages of new workers by 50%. This avenue could be utilized to increase the workforce needed to prepare for the future demand and skills requirements.
- Innovation
 - Through Alberta Innovates, the province supports research and innovation programs which can develop and grow the clean technology sector in Alberta. This includes financial support and expertise related to biofibre products and green construction alternatives for buildings.

CITY OF EDMONTON

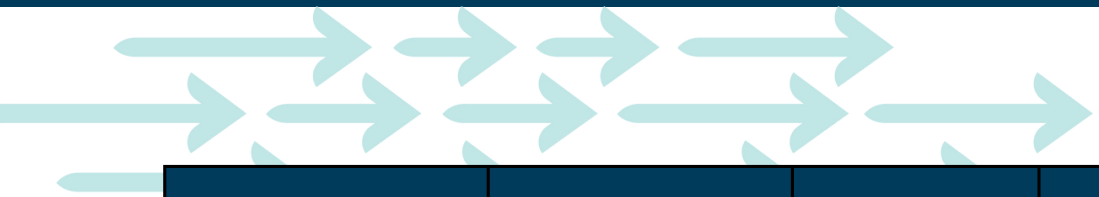
The key policies of note from the City of Edmonton that target GHG emissions and directly impact the building industry are the Climate Resilient Policy C627 and the Community Energy Transition Strategy and Action Plan (CETS). Policy C627 drives city planning, development and business decisions related to city owned assets whereas the CETS is the GHG reduction strategy for the whole community. To maintain consistency and clarity, Table 2 focuses solely on the CETS followed by important highlights from Policy C627.

The Emissions Neutral Buildings Pathway of the CETS includes actions for new and existing buildings and capacity building with the overall outcome of "highly energy efficient, healthy homes and buildings, powered by renewable energy". As can be seen in the table below, in the short term the City of Edmonton is focused on using incentives or voluntary measures to drive building performance at the community level.

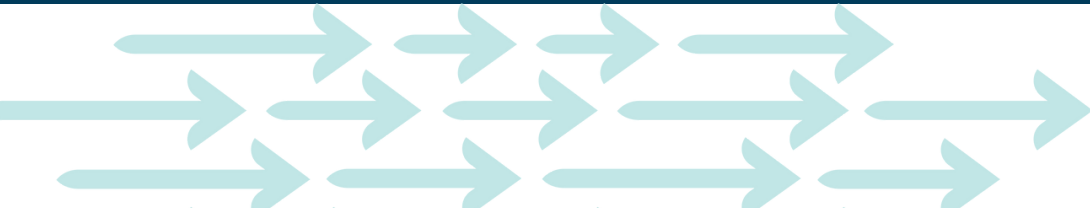


Table 2 – Short and Medium Term Policy Actions

	Regulatory	Incentives	Capacity Building	Innovation
In Progress		Financial incentives for retrofits (residential and commercial)	Industry advisory group	
		Incentivize energy labelling and disclosure (residential and commercial)	Webinar series on industry best practices	
		Clean Energy Improvement Program for residential and commercial retrofits (pilot)	Consumer and tenant education	
		Incentives specific to affordable housing		
In Development		Performance based incentives (financial and non-financial) to build better than code	Cost sharing database	District Heating and cooling strategy



	Regulatory	Incentives	Capacity Building	Innovation
Planned/Mentioned Short Term	Align with Federal and Provincial codes		BUILDING KNOWLEDGE EXCHANGE	
	Apply GHG mitigation elements to urban renewal projects and redevelopment		Market wide access to building energy consumption data	
	Integrate climate resilience into development permitting and approval processes			
Medium Term	Mandatory benchmarking, disclosure and labelling			Support and promote local green building expertise, innovation, technologies and products
	Reporting of embodied carbon emissions in new construction			

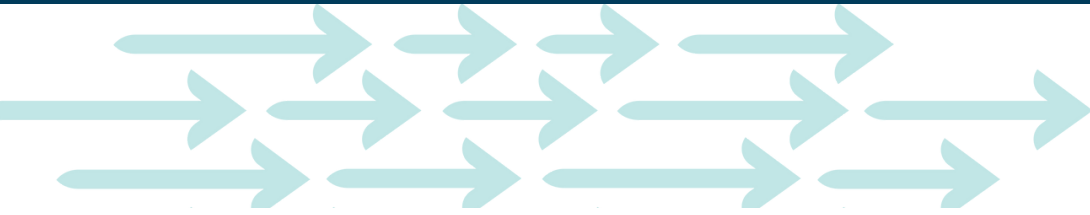


- Regulatory – the regulatory focus for the City of Edmonton is to align with Federal and Provincial governments on the implementation of increasingly stringent building codes. Since code adoption is the responsibility of the province, this is still showing as a planned activity.
- Incentives or Financing – In the short-term, the City of Edmonton is focused on using incentives or voluntary measures to drive building performance at the community level. These include retrofit incentives for residential and commercial buildings, energy labelling and disclosure, and performance-based incentives for new residential and commercial construction.
- Capacity Building – The City of Edmonton is actively engaging with industry on the development of planned incentive activities and to support industry-led capacity building through an Emission Neutral Building Knowledge Exchange.
- Innovation – The City of Edmonton references fostering innovation throughout their plan, specifically in support of local entrepreneurs and businesses. The main project however was the development of a district heating and cooling strategy.

Policy C627 (for City owned buildings)

- New buildings are to be designed Emissions Neutral (An Emissions Neutral building is a building that is highly energy efficient and: a) uses only Renewable Energy for its operations on an annualized average basis (this may include either on or offsite generated Renewable Energy), OR b) produces and supplies onsite Renewable Energy in an amount sufficient to offset the annual greenhouse gas emissions associated with the energy consumed for its operations.)
- The emissions neutral building must also consume 20% less energy compared to the National Energy Code for Buildings (NECB) 2017 reference building on an annual basis before accounting for Renewable Energy; and have a Thermal Energy Demand Intensity (TEDI) less than 50 kilowatt hours per square meter for office Buildings, or less than 80 kilowatt hours per square meter (ekWh/m²) for all non-office building archetypes.
- All New Construction shall require Embodied Carbon assessments and must consider using the material with the lowest Embodied Carbon for an otherwise equivalent material. This review and consideration must be documented alongside the Embodied Carbon assessment.
- Developing a plan to retrofit existing buildings to emission neutral standard
- Continual improvement for climate resilience

Of note, the City of Edmonton developed a carbon budget in which it completes a GHG impact assessment of each budget request to provide decision-makers with a holistic view of the GHG impacts in the capital operating and utility budgets. This approach means that decision making related to all city funded capital projects will include consideration for the carbon impact of those projects.



CITY OF CALGARY

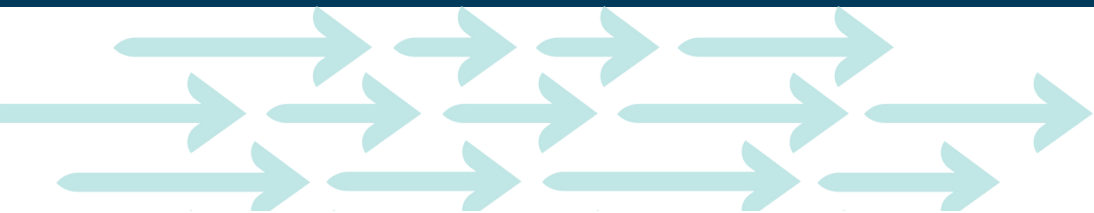
Overall the Calgary Climate Strategy is “pathway” based, similar to the Edmonton strategy, which allows for a phased approach that typically starts with voluntary measures prior to moving to the introduction of regulatory measures. This is intended to encourage capacity building in the industry while also identifying and addressing barriers to large scale implementation.

The main pathways reviewed and summarized in table 3 were related to new and existing buildings reaching a net zero standard. The Calgary plan also includes a separate pathway to address energy poverty which has a retrofit component that is expected to align with the actions outlined in other pathways. There were also relevant actions included in the summary from the Net Zero Communities theme as they impact community development or the buildings within those communities.

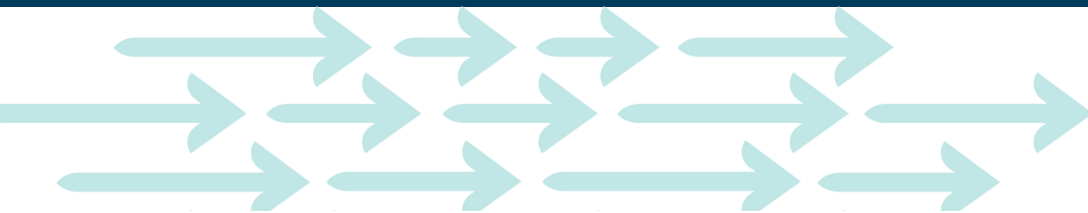
The Sustainable Building Policy which guides the construction of city owned buildings was not included in this summary review as it is expected to be updated to align with the Climate Strategy.

Table 3 – City of Calgary Short and Medium Term Policy Actions

	Regulatory	Incentives	Capacity Building	Innovation
In Progress		Clean Energy Improvement Program for residential retrofits		
In Development		Non-financial incentives for deep energy retrofits (residential and commercial)	BUILDING KNOWLEDGE EXCHANGE	
	Mandatory energy labelling, benchmarking and disclosure (residential and commercial)			

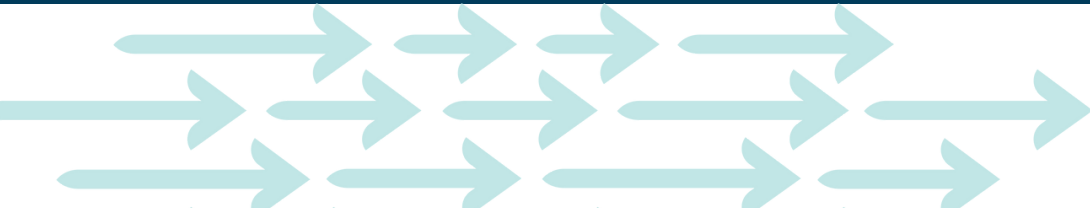


	Regulatory	Incentives	Capacity Building	Innovation
In Development	EV ready standard for new residential buildings			
	Commercial buildings meet specific EV-readiness requirements			
Planned/Mentioned(Short-term)	Align with Federal and Provincial codes	Clean Energy Improvement Program for commercial retrofits	Work with utilities to support electrification	Strategy to increase implementation of Solar PV for all building types
	Municipal Development Plans and Local Area Plans to align with climate mitigation strategies	Non financial incentives to build better than code		
		Incentives specific to affordable housing		
Planned or Mentioned (Medium-Term)	Net Zero Building standard for new construction	Net Zero retrofit incentive for greater downtown		Strategy for increased use of low carbon building materials (new and retrofit)



	Regulatory	Incentives	Capacity Building	Innovation
Planned or Mentioned (Medium-Term)	Emissions performance standard for retrofits	Retrofit Incentive for adaptive reuse of buildings		
	Net Zero Emissions and Climate Resilient Design Guidelines for new and established communities	retrofit incentives for tenants		
		Financial retrofit incentives (residential and commercial)		
		Financing program to leverage public and private financing		
		Financial incentives to build better than code		

- Regulation – The City of Calgary is specifically driving regulation for energy labelling, benchmarking and disclosure for new and existing buildings in all building sectors. Similarly to the City of Edmonton, Calgary will align with provincial code however are developing Electric Vehicle requirements for new residential and commercial buildings.
- Incentives or Financing – The City of Calgary’s short term incentives actions are non-financial incentives moving to financial incentives as the plan progresses.
- Capacity Building – Again, Calgary is aligned with Edmonton for Capacity Building and will focus on industry needs by facilitating an “information sharing, capacity-building and skills training centre”



DEFINITIONS

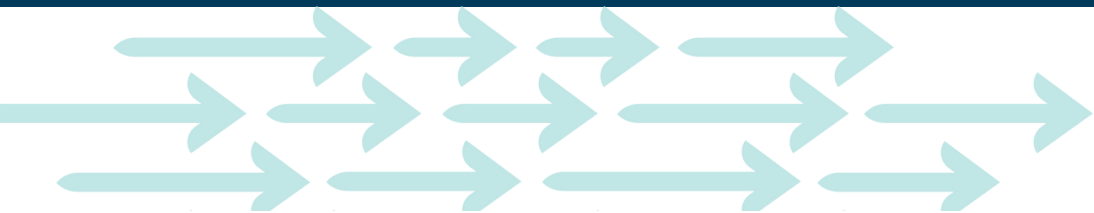
Zero-carbon building: The Canadian Green Building Council (CaGBC) defines a zero-carbon building as one that is highly energy-efficient and minimizes greenhouse gas emissions from building materials and operations. Until all emissions can be eliminated, high-quality carbon offsets can be used as a counterbalance.

Zero-carbon ready: The International Energy Agency (IEA) defines a zero-carbon ready building as one that is highly energy efficient and uses either renewable energy directly or uses an energy supply that will be fully decarbonized by 2050, such as electricity or district heat. A zero-carbon ready building is expected to become a zero-carbon building by Defining Net-Zero Emissions

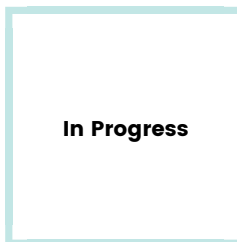
Net-zero emissions: The government of Canada defines Net-Zero Emissions as the point when the economy emits no greenhouse gas emissions or offsets its emissions. The emissions balance will be achieved by reducing the majority of emissions through low-carbon technology and energy systems and removing any remaining emissions through nature-based or technological solutions.

Emissions Neutral Buildings: The City of Edmonton uses the term Emissions Neutral Buildings as buildings that are highly energy efficient and powered by renewable energy.

Net Zero Homes and Building: The City of Calgary uses the term Net Zero Homes and Buildings as buildings that are highly energy efficient buildings that produce or procure emissions-free renewable energy or high-quality carbon offsets to counterbalance annual carbon emissions from buildings materials and operations. 2050, without any further changes to the building or its equipment.

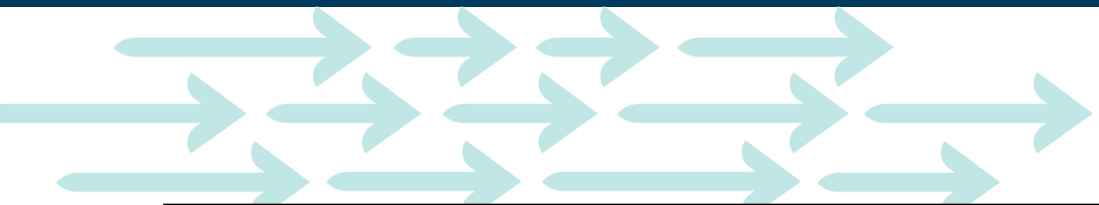


APPENDIX A



Federal, Provincial, Municipal Climate Policy Actions - Short Term (2023-24)

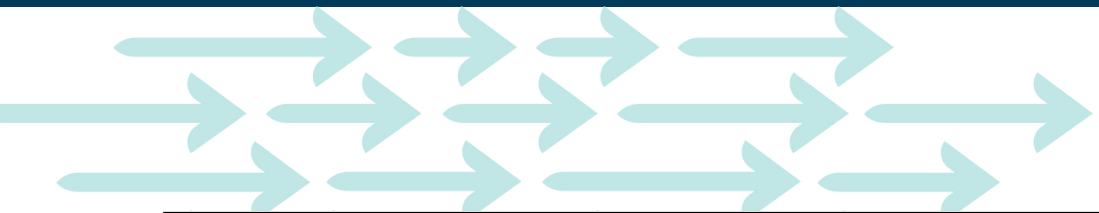
	Canada	Alberta	Calgary	Edmonton
Regulation	Increasingly stringent building code	National Model Code Adoption	Align with Federal and Provincial codes	Align with Federal and Provincial codes
	Time of sale home labelling		Mandatory energy labelling, benchmarking and disclosure (residential and commercial)	Apply GHG mitigation elements to urban renewal projects and redevelopment
	Transition off fossil fuels		EV ready standard for new residential buildings	
			Commercial buildings meet specific EV-readiness requirements	
			Municipal Development Plans and Local Area Plans to align with climate mitigation strategies	



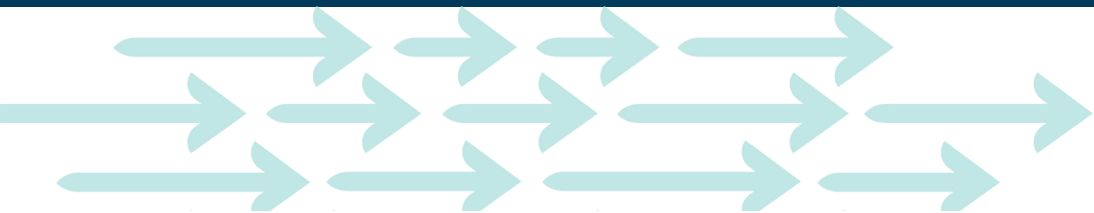
In Progress

In Development

	Canada	Alberta	Calgary	Edmonton
Incentives	Grants and Loans for Retrofits (residential and commercial)	Commercial energy efficiency upgrades	Non-financial incentives for deep energy retrofits (residential and commercial)	Financial incentives for retrofits (residential and commercial)
	Greener Neighborhood Pilot (accelerate)		Clean Energy Improvement Program for residential retrofits	Incentivize energy labelling and disclosure (residential and commercial)
	Low-interest financing (large projects)		Clean Energy Improvement Program for commercial retrofits	Clean Energy Improvement Program for residential and commercial retrofits (pilot)
	Heat pump incentives		Non financial incentives to build better than code	Incentives specific to affordable housing
	Net Zero Building Code Acceleration fund for provinces and municipalities			Performance based incentives (financial and non-financial) to build better than code



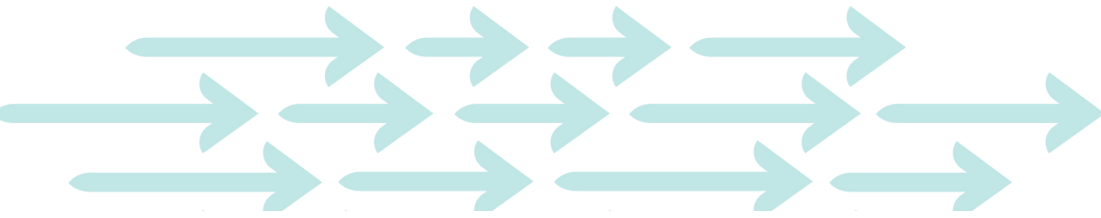
	Canada	Alberta	Calgary	Edmonton
Capacity Building	Deep retrofit accelerator		BUILDING KNOWLEDGE EXCHANGE	Industry advisory group
	Clean Jobs Training Centre			Webinar series on industry best practices
	Training funding for Unition Training and Innovation Program			Consumer and tenant education
				Cost sharing database
				BUILDING KNOWLEDGE EXCHANGE
				Market wide access to energy consumption data for all buildings



	Canada	Alberta	Calgary	Edmonton
Innovation	Low Carbon Building Materials Innovation Hub	Research and innovation programs for biofibre and green construction alternatives	Strategy to increase implementation of Solar PV for all building types	District Heating and cooling strategy

Municipal Climate Policy Actions - Medium to Long-Term (2025 and beyond)

	Calgary	Edmonton
Regulation	Net Zero Building standard for new construction	Increasingly stringent building codes
	Emissions performance standard for retrofits	mandatory benchmarking, disclosure and labelling
	Net Zero Emissions and Climate Resilient Design Guidelines for new and established communities	



	Calgary	Edmonton
Incentives	Net Zero retrofit incentive for greater downtown	Increasingly stringent building codes
	Retrofit Incentive for adaptive reuse of buildings	mandatory benchmarking, disclosure and labelling
	retrofit incentives for tenants	
	Financial retrofit incentives (residential and commercial)	
	Financing program to leverage public and private financing	
	Financial incentives to build better than code	
Capacity Building	Capacity Building	Capacity Building
Innovation	Strategy for increased use of low carbon building materials (new and retrofit)	Support and promote local green building expertise, innovation, technologies and products

Appendix D:

Shaping the Exchange

Industry Needs and Gaps Analysis



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ABOUT SHAPING THE EXCHANGE

The “Shaping the Exchange” was a stakeholder engagement process intended to guide the collaborative visioning of a Building Information Exchange (BIX), inform the business planning for the incubation and launch of the exchange and ultimately catalyze the design and delivery of the program offerings for the next three years. This was a multi-stage approach to engage, excite and mobilize a group of leaders in an effort to co-create a Building Information Exchange that supports the Calgary Building Industry through the transformational change required to achieve net zero carbon and resilient buildings.

This initiative was led by Alberta Ecotrust, the Smart Sustainable Resilient Infrastructure Association (SSRIA), and the Calgary Construction Association, funded by the City of Calgary. This engagement began to identify industry needs, challenges, and any market or regulatory gaps that exist with respect to net-zero emissions buildings. The engagement assisted interested parties in evaluating various models for the implementation of the Exchange in Calgary.

ABBREVIATIONS

The following are frequent abbreviations that are used throughout the report.

BIX – Building Information Exchange

DSM – Demand Side Management

HP – high performance buildings

NZE – Net Zero Energy

NZEm – Net Zero Emissions

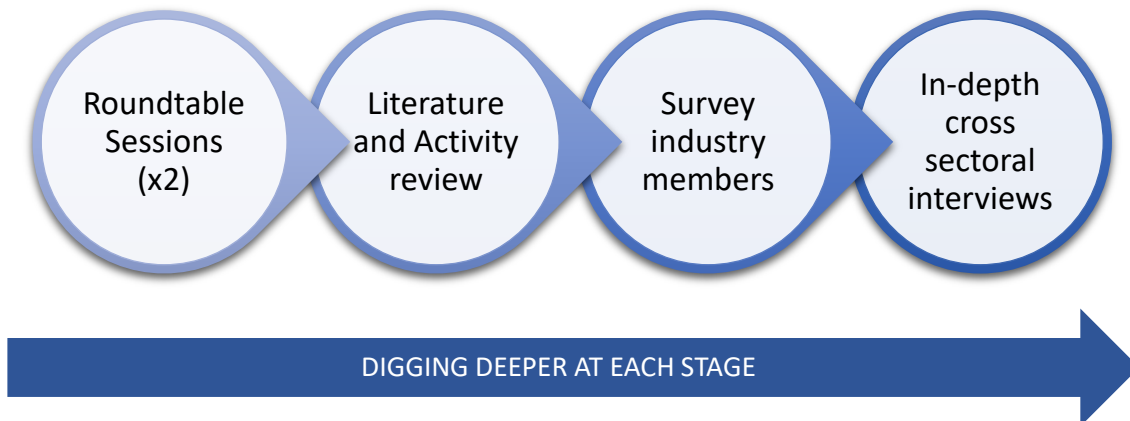
Residential SF – Single family

Residential MF – Multi-family

RESEARCH PURPOSE

In close consultation with members of industry, multi-stage research was conducted to identify and clearly understand the barriers and needs of industry members relating to designing and building net zero emissions buildings. Throughout the process the participating industry members were clear that the BIX should not overlap with existing initiatives in market but rather collaborate with and amplify existing work. To this end the research also examined what various industry groups were already doing. Overall, the research provides a better understanding of the needs and gaps that exist to move the building industry towards net zero emissions targets and the immediate needs to be addressed to start to close the gap. This information will be incorporated into the development of a business plan for a BIX in Alberta, including recommendations on immediate activities that can be deployed in support of industry capacity building.

RESEARCH METHOD



As shown in the graphic, each stage of the “Shaping the Exchange” needs assessment and gap analysis informed the next allowing for more in-depth probing as the research progressed. The first Roundtable discussion started to identify barriers and needs and how a BIX could address those. This initial discussion with industry members also identified that many members were unclear about what a BIX was and what the value would be in Alberta. This uncertainty was addressed with the 2nd Roundtable which was designed as an in-depth discovery session with Canada’s first building exchange. A literature review of relevant studies and reports regarding net zero buildings was completed to further identify barriers, areas for immediate focus, and the areas where industry should be leading with solutions or supporting the development of solutions by others like government. While key themes and messages from the literature review were used to develop the surveys and interviews in stage 3 and 4, it has also been integrated in the following report with the full summary in Appendix A. The surveys were applied to reach a larger audience and to better quantify the initial information that was being captured. This stage also started to explore activities that a BIX could deliver, and which would best meet the needs of the industry members. Finally, a selection of industry members, that represented a cross section of the building industry fields (architects, developers, etc.) and sectors (commercial, residential, etc.) were interviewed. The interview questions were developed to build off the information already collected up to that point and were an opportunity to collect more in-depth analysis about topics identified. The interviews were done in confidentiality therefore only the summary of those interviews is being shared within this report. The questions were targeted to each representative based on their sector or field of expertise, but the general themes of questions were the following:

- Qualifying questions
- Technical
- Financial
- Regulatory
- Knowledge and Workforce
- Industry collaboration
- Education and Training

PARTICIPANTS

The data collected at each stage was collected confidentially and is not to be attributed to a specific person or company. Through each phase however, apart from the surveys, the various sectors that respondents represent were identified which allowed for identification of barriers or gaps that were specific to only one sector.

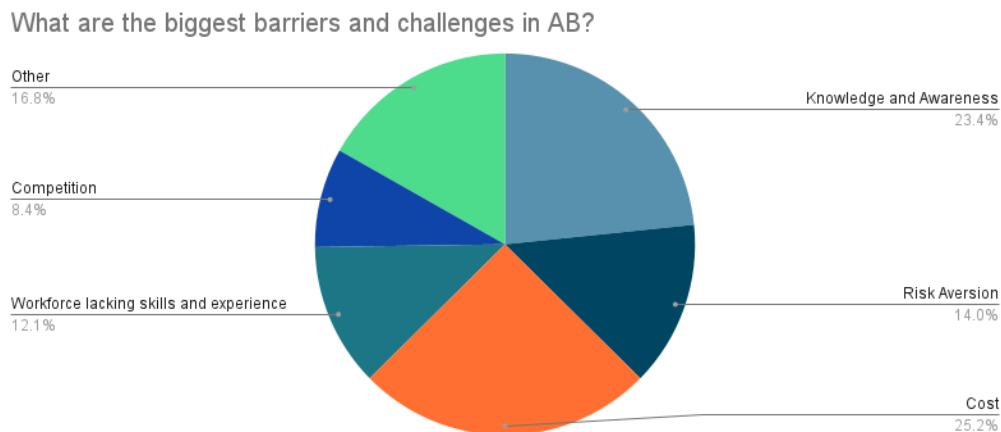
The sectors included in the research were the following:

- Architecture
- Builders (residential)
- Construction (commercial)
- Consulting
- Developers
- Education and Research
- Engineering
- Government
- Non-Profit
- Utilities (not included in interviews)

Many of the above fields were represented by industry associations as well as companies within those fields.

FINDINGS

The initial survey results were used to develop the in-depth interviews. Within those surveys participants were able to select multiple barriers. An average of 4.5 barriers were selected with a total of 15 barriers identified which demonstrates this is a multi-faceted issue that will require multiple approaches to address the needs and fill the gaps. The top barriers noted in the survey are illustrated in the graph below. Complete survey results and analysis is included in Appendix B.



The table below is a more detailed summary of the barriers and needs identified through the “Shaping the Exchange” process, notably the in-depth interviews. These barriers generally reflect the entire

building industry and building typologies. Where there were barriers specific to a sector or field of expertise, these have been detailed in the Specific Barriers and Needs section. The barriers largely could all be categorized as market, financial, technical, or knowledge. Risk was also a recurring theme but tied into each of the other barrier themes so has instead been highlighted in the detail section of the table below.

Theme	Barrier	Detail
Market	Regulatory regime	Limited regulatory drivers. Signals of regulatory change to come is not sufficient to drive change because it is not well understood or in many cases not believed
	Limited market demand	Demand is insufficient for many to make a business case to actively build the technical and knowledge capacity related to NZEm. Residential SF demand is met by custom builders that operate in a small niche market. Commercial demand is largely focused in the institutional sector and driven by government or large corporations with sustainability mandates. In the absence of direct market demand, there is a very high risk for companies to include NZEm approaches in their projects.
	Insufficient incentives	No DSM in Alberta, Federal and provincial incentive programs insufficient or incent standard home and building upgrades as opposed to NZEm upgrades
	Hyper Inflation	Many members of the industry are in survival mode and therefore cannot take on any added scope that puts their already diminishing returns at risk .
Financial	Split incentives	This was common across the commercial and residential MF sectors where the builder is not going to be managing or paying for the building operations.
	Higher cost than standard builds	It was noted in numerous discussions that the high cost may only be perception and that higher costs of added materials and expertise could be balanced out elsewhere in a project. However again in the absence of demand, there are limited opportunities for industry members to define a cost-effective approach. High cost was attributed to the need for more material, more expertise, lack of experience (which may lead to marked up pricing to mitigate risk). In the construction and residential builder fields, there are very well-established processes for which costs are well known so the risk is very high to stray from this.
	High cost of training	Cost is equally a barrier when it comes to training for existing professionals to gain knowledge and skills that would support transitioning to NZEm buildings (including better understanding the economics). In the absence of demand, there is no driver for companies to pay for training that does not return immediate value.
	Procurement models and capital budgets	Particularly for large owners, the procurement models used for designing and building their projects and the budgeting process for those projects restrict the ability for industry leaders to apply their NZEm knowledge and be innovative on projects. There are also often disincentives to innovate in the delivery of these projects (Eg: a project manager is incented on meeting time and budget so they don't stray from what they know which could put budgets and schedules at risk).
	Valuation	It is difficult to value higher performing and more resilient buildings.

Theme	Barrier	Detail
Knowledge	Air barriers and insulation	Air barriers and insulation are a critical component of a NZE and NZEm building and an area that can immediately start to be upgraded in standard projects. Every field needs to understand the importance of a tight building envelope, but trades particularly need more skill and knowledge of this area.
	Electrification and Utility model	The implications of electrifications in AB may not be well understood by all or marred by “myths” and misunderstanding.
	Limited opportunity to learn from real projects (particularly local projects)	Post-occupancy monitoring is rarely completed by those design teams therefore it is not possible to learn from success or identify and learn from failures. Learning from real projects, specifically local projects, would address the perceived risks and costs of NZEm buildings.
	Limited knowledge of cost related to NZEm and the economics of NZEm buildings	All interviewees believed it costs more to build NZEm and generally understood why the costs were higher but did not have a clear understanding of what those costs are. In addition, an understanding of the overall economics of NZEm buildings in Alberta is not well understood by industry members or by consumers (which ultimately impacts demand). This is further impacted by lack of access to overall utility data or benchmarking of energy use in buildings
	Lack of understanding of regulation and policy that will impact the building industry	All levels of government have net zero targets and related policies to achieve those targets which should provide the necessary market signals regarding upcoming change. However, this is not well understood by the market or disregarded (“I will believe it when I see it”).
	Limited hands-on experience in the workforce	There are programs and courses that are educating students on NZEm concepts however employers are also looking for hands on experience. This was particularly noted for energy modelling.
	Reluctance to share	The reluctance to share information with other industry members impacts the spread of knowledge but also the effectiveness of the BIX. Some industries were more readily open to share (architecture and engineering) and there are models of informal sharing in other fields which are built on trust.
	Remote and rural knowledge for maintenance	Maintenance knowledge for new or outside of the norm mechanical and energy systems is both a barrier and concern for remote and rural parts of Alberta.
Theme	Barrier	Detail
Technical	Regulatory issues for new products and materials	Applying innovation to buildings, particularly in the form of new products or building materials are sometimes hindered by permitting processes.
	Proof of concept risk or liability	For widespread adoption, industry needs proof of concept in a local context for new building technology, products or processes. Due to the risk and liability associated to being an early adopter, very few are willing to play this role
	Lack of quality control	High performance construction requires start to finish quality control, particularly with higher performing envelopes. The way trades are siloed increases the risk that the air barrier is compromised particularly when there is an overall lack of knowledge of the importance of air barriers in NZE construction.

SPECIFIC BARRIERS AND NEEDS

Split Incentives

Amongst developers, there are some companies who “build to sell”, many of which come from out of country therefore have no motivators to build to a higher standard (considering the lack of demand for this type of building) and are not engaged locally to be part of capacity building initiatives. This problem is further aggravated by the propensity for brokers to sell office space based on lowest rent without consideration for added operating costs in a space.

Knowledge of Costs

In the residential SF sector, particularly with retrofits, the nature of the supply chain and supplier relationships makes understanding the average cost of projects very difficult. In addition to that, costs are currently fluctuating month to month. With more builders building NZE homes, the costs are becoming better known and these have been captured by the CHBA nationally for various climate zones.

The cost related to designing NZEm buildings is better understood, and it is dependent on the approach being taken (ie: passive vs active). It is the technology or approaches that are unknown to a designer that increase cost.

Legalities

Designers of buildings need to understand if they have a legal or ethical responsibility to notify clients of their building designs being able to withstand more commonly occurring climate events. There have been lawsuits filed in the United States related to this concern.

Building Operator Knowledge

HP buildings can be more complex to operate and yet building users and operators have the most impact on a building's performance. Buildings can be designed to meet NZEm or HP targets however if improperly operated, they will not meet their designed potential.

Utility data

For commercial real estate developers that own and operate their buildings, they are unable to access unit specific utility data and therefore are unable to make decisions that could optimize their buildings.

Limited workforce

Developers noted lack of expertise related to life cycle assessment, cost analysis, NZE design, and lack of Energy Advisors which they rely on for a lot of their building performance detail.

For the engineering sector, it was noted that there is a very shallow workforce but a growing need for this field of expertise in the building sector.

Risk

It was noted that designers take on the most significant risk when taking on NZEm projects in the commercial sector.

MOTIVATORS FOR ACTION

As noted in the barriers, overall demand for net zero emissions buildings was low but all stakeholders were still actively involved in net zero and high-performance projects or engaging in the topic. The motivators for them to act in the absence a regulatory requirement or large demand are the following:

- Corporate net zero targets or sustainability mandates (typically in large national or multi-national firms)
- To demonstrate leadership
- To get ahead of market demand
- Market differentiation

For the training and educational sector, they are working to be just ahead of industry transformation so that when students enter the workforce, they have the necessary knowledge to meet the industries needs. This sector is also largely motivated by demand for training, particularly for continuing education. There are courses and curriculum that can be deployed to existing professionals, but the institutions first need to have the data that there are people wanting to take those courses.

MOTIVATORS FOR PARTICIPATING IN A BIX

While it was noted that some industry members will not act on NZE or NZEm until there is sufficient demand or regulation in place, there is still significant interest in BIX and the opportunity to fill knowledge gaps and be part of an information sharing network (as contributors and receivers). Many of the research participants represented industry associations and did not see overlap with information they were already sharing or activities they were hosting related to NZEm. The one exception to this was in the residential SF sector where CHBA and BILD are active in sharing information about NZE.

The solutions or types of activities that appealed most to research participants were the following:

- Data on costs (upfront and operational)
- Detailed case studies
- Advocacy and dialog related to policy, building codes and process barriers created by government
- Highlighting the work of others (events and training) already present in this space
- Research on decarbonization solutions that are specific to the region
- Standardization of language and approach
- High performance training that is practical

Of the potential functions of a BIX, knowledge sharing was highlighted as the most valued function (through case studies, research on cost, and research on technical solutions particularly those items that are Calgary specific). Training and advocacy were the next highest priority areas. SAIT and NAIT have training already developed as do other institutions. These institutions also have additional intentions to develop more course materials for both student and continuing education audiences therefore the focus of the BIX for training should be to jointly identify the training gaps and support the institutions in identifying the audience and demand to move these training opportunities forward.

The idea of advocacy as a role for BIX will need to be further explored. Although it was identified as a gap, with no significant advocacy for NZEm in Alberta, there were differing views as to whether this was an appropriate role for BIX to fill. An immediate role for BIX would be to share information about

government regulation and policies that impact the building industry, foster dialog related to regulatory barriers to reaching NZEm, and showcase successful NZEm approaches. Industry associations and individual companies can then use this information in their current advocacy efforts.

CURRENT MARKET ACTIVITIES

The following organisations were mentioned by the participants as sources for information and training related to NZEm:

- BILD (understanding code and other regulatory impacts)
- CHBA (comprehensive NZE training programs or new and retrofit residential construction)
- Industry conferences (GreenBuild, BuildX, etc)
- Passive House Canada (Training)
- ASHRAE
- CaGBC
- ZEBx

This is not presented as an exhaustive list but rather the start of a list of other organizations whose activities should be explored and mapped to limit overlap and identify opportunities for collaboration. In many cases these and all industry and professional associations are active with their specific member groups, but BIX was identified as an opportunity to have all these members gather outside of their silos to learn from each other. Additionally, there are opportunities to infuse NZEm knowledge and information into existing activities of the above groups.

RECOMMENDATIONS

Knowledge and Awareness Needs

This was the area that was highlighted as the greatest need through the Shaping the Exchange research. The key knowledge topics to immediately focus on were the following:

- Economics – There was significant emphasis that a basic understanding of cost was needed and that includes the initial or first cost of NZEm buildings as well as the operating costs. This was noted as a need in all sectors and building types, and among those with both high and moderate NZEm knowledge. Economics related knowledge should be focused on all building types and stakeholders including owners. This can be in the form of case studies that share details on cost or information about life cycle analysis (LCA) and the value of applying this to projects. Additionally, many industry members are engaged in developing detailed LCAs and cost analyses for their project clients (including evaluating multiple scenarios to support owner decision making) so an opportunity would be to explore if these clients would be willing to share this valuable information for industry wide learning.
 - Consider engaging Quantity Surveyors in BIX as an important knowledge source related to building construction costs
- Regulation and Policy (including federal and provincial budgets) – Understanding regulation and policy was noted as a significant gap, with few sectors or professions having a source to synthesize, analyse and share this information. The value in sharing this knowledge is to

highlight these items as valid market signals which should be considered in strategic planning and business decision making related to capacity building for the future.

- Technical information – In the interviews, participants were asked if the technology, products, and processes exist to get to NZEm. Those with a high NZEm knowledge level all agreed that there are not technical barriers to building NZEm however this knowledge is not widespread throughout industry. In fact, some participants weren't even sure where to go for NZEm expertise. Technical information should be directly related to real projects that have been delivered in Alberta or in a similar climate (although there is less confidence in information from outside of Alberta). This information can be shared through webinars, case studies, or tours. In the jurisdictional scan, one activity that was shown to be an effective way to share technical information were junkets that had the added advantage of integrating members with high and low NZEm knowledge so they could learn from each other.

The sharing of knowledge is dependent on industry members willingness to share both successes and failures. Many participants indicated a willingness to share although there were some sectors that were less willing to share due to the potential competitive impact. In those sectors, largely the residential SF and MF sector among both developers and builders, information is shared in small informal circles that have been built on relationships and trust. The same relationship building and most importantly trust building will need to be developed for BIX. Developing conflict of interest, and confidentiality policies for the operational structures will be important. Starting with topics that are less competitive in nature and participants who are more open to sharing can help demonstrate the value of information sharing and building relationships within the community.

Training

- Additional research is required to better understand all the training offerings that are applicable to this area and how BIX can support the delivery of that training.
 - The biggest opportunity is identifying the audience demand for training programs so that those that specialise in developing training can ensure they are making those offerings available.
 - Air barriers were noted as a high priority area for training that could immediately and cost effectively impact the energy use of our buildings in both new and retrofit construction.
 - Training related to Life Cycle Assessment and cost analysis would further address the significant need and gap found related to economics of NZEm buildings.
 - General building science understanding for those professions and trades who typically are only involved in one component of the building construction.
 - Explore what BOMA or others are offering related to training for building operators as operations was noted as having a high impact on HP buildings.

Research

- Review procurement models from large owners and identify the barriers these create to innovation and delivering higher performance buildings. This research can be completed with industry members who are involved in those procurement processes as they have direct experience and clearly understand the barriers.
- Research legal implications related to buildings and climate resilience to determine if this is an immediate or potential future concern in Canada that industry should be informed about.

Planning

- Pilots and demonstrations were noted as important sources of information to build confidence and reduce the perceived risks associated with NZEm buildings. Explore existing pilots and demonstrations that are taking place in Alberta and Canada and how the information from those can be utilized in knowledge sharing activities.
- Work with utility stakeholders to understand the impact of electrification and opportunities related to data sharing.

APPENDIX A - LITERATURE REVIEW

1. SSRIA Zero Carbon Building Report, D. Sudeyko, T. Nabholz, M. Ross, A. Kodyra, January 2020.

Summary

The report serves as a market assessment and implementation forecast of both new, and existing buildings to aid in stimulating and encouraging future low-carbon focused projects and a carbon healthy market in Alberta. The report includes a review of eight building typologies to understand how zero carbon buildings can be achieved. The researchers also identified key barriers to adoption and completed an impact gap analysis to determine which areas should be the primary focus due to their immediate impact potential.

Noted barriers and gaps

- Future costs are not considered by decision makers
- Low awareness among consumers and designers
- Building performance gap
- Split incentives
- Invisible nature of energy makes it a difficult “sell”
- Buildings codes only set minimum standards with no market incentive to exceed the minimum
- Limited political leadership for improved buildings in Alberta
- Energy costs incent natural gas use over electricity use
- Alberta climate makes use of “new” heating technology even riskier
- Alberta’s electric grid emissions intensity
- Wide range of solar potential across Alberta which means the strategy to decarbonize in Medicine Hat won’t necessarily work, or will cost significantly more, in Fort McMurray

Noted areas of high impact (specific to areas SSRIA could influence)

- Advocacy to take action based on research, leverage advocacy efforts of other organizations.
- Education across sectors and disciplines
 - For residential focus on resiliency
 - For mid-rise multifamily focus on GHG reductions
 - For hi rise multifamily focus on resiliency, ghg reductions
 - For commercial and warehouses focus on ghg reductions
- Incentivizing actions (of operators, owners, and occupants) that reduce operational GHG emissions
- Policy research and recommendations for large buildings as there is little to no policy currently in place with a large impact potential

Zero Carbon Techniques to Focus On

- Building Massing

- Envelope design and Air Tightness (including insulation and thermal bridging)
- Window to Wall Ratio and Distribution

Zero carbon Technologies to Focus On

- CHP (Combined heat and power) and Micro CHP
- GeoExchange
- Heat pumps
- Low Temperature Heating Distribution systems
- Solar PV
- Solar Thermal
- Heat/Energy Recovery Ventilation
- Wind energy

2. [Reducing Greenhouse Gas Emissions in Housing: An Industry Approach](#), BILD Alberta, June 2021.

Summary

This report was developed in response to BILD members who felt the building code development process favoured Eastern Canada and BC and did not address Alberta barriers. While the report is focused on an approach to tiered building code adoption in Alberta, it does identify barriers to high, particularly that residential builders need support with the transition to the targets being set at the federal level. This report is specific to barriers encountered in residential new and existing construction.

Noted barriers and issues

- Alberta residential industry has concerns with federal climate plans and emission reduction, most notably that electrification and zero carbon targets pose problems for the largely natural gas heated homes in Alberta.
- Heavily regulated environment makes it frustrating to innovate. Additionally, the market and competition play a large role in how quickly innovation is introduced
 - Innovation is led by small, custom builders who deal with forward thinking clients. Larger companies watch the innovation happening in this smaller companies and will start to apply it when they feel risk is low.
 - Large companies are however better suited to demonstration projects since they have better purchasing power
- Builders and developers are looking for more information on Net Zero construction, particularly outside of Edmonton and Calgary
- There are no technical barriers to building Net Zero Energy in Alberta today. Barriers are related to risk and affordability
 - Lot orientation and servicing

- Affordability (eg: \$50,000 to \$60,000 more than code built) with adding PV the costliest addition for a net zero home. Residential housing market is significantly more cost sensitive, particularly to first cost, than commercial buildings.
- Economic downturns impact the ability of a builder to add any costs
- Builders believe incentives, labeling, public awareness campaigns and new affordable materials and equipment.
- Builders see value in communicating success but have traditionally lacked in this area
- The carbon intensity of the grid is a major barrier to reach zero carbon
- There is resistance to adopting new wall construction techniques/materials due to durability, buildability, limited lot sizes, and market acceptance.
- Air tightness, basement insulation, windows, and HRVs are areas for continued efficiency improvement
- Downswings in the economy, such as in 2020, saw builders revert to more traditional envelope construction and ventilation to manage costs.
- This is a very competitive industry that is not as open to sharing experiences which would expedite innovation.
- Increased complexity of codes will require energy advisors to be involved in construction
 - Although no guarantee that energy has a good understanding of house as a system
- The shift to electrification also increases operating costs for owners
- Real estate, appraisal and financing industries do not currently value energy efficiency upgrades in a home
- There is limited demand for residential energy retrofitting in Alberta
- National retrofit code could be a significant learning curve for local renovators, need to stay on top of this

3. [Tiered Energy Code Roadmap, BILD Alberta August 2022](#)

Summary

This report provides a review of the 2020 National Building and Energy Codes and their potential impact on the home builder market in Alberta. The report provides recommendations to the Government of Alberta in consideration of an adoption path for the new code.

Noted barriers to implementation of tiered codes

- Available energy advisors for air tightness testing, particularly outside of Alberta's major centres and for multi-unit buildings
- The need for more insulation and energy-efficient windows will increase cost
- Unknown if existing electricity infrastructure can support the broad move to electrification as required in tier 4
- Home heating challenges
- Builder education on performance path (as many still use prescriptive path)
- Homeowners need to be educated on new home systems (ie, turning off HRV)

- Building officials will require training on the performance compliance path, particularly outside of large centres.
- Training needed on building airtight homes efficiently and cost-effectively – This is to support bringing the cost down
- Sub-division design – how to get all homes oriented for optimized solar heat gain and solar exposure
- HVAC technician knowledge about heat pumps and alternative heating systems is limited.
- Designing for solar panels may result in significant architectural changes for some builders to ensure adequate roof space

Role of BILD

- Incubates industry action
- Work with CHBA national to bring forward industry concerns to Federal Government
- Establish Residential Construction Climate Advisory Council with Provincial government (include energy advisors, builders, developers, muni and prov govt)
- Work collaboratively with municipalities on provincial advocacy re: climate change
- **BILD noted in the report the need for a residential industry carbon neutrality accelerator program that would plan, initiate, and report on various pro-active GHG initiatives**
- Information and training

4. [Sustainable Housing: Understanding the Barriers to Adopting Net Zero Energy Homes in Ontario, Canada](#), Ranjita Singh, Philip Walsh, Christina Mazza, 2019.

Summary

This academic study examined barriers from a home buyers' perspective, specifically in the Ontario market. However, since they are largely behavioural in nature, these barriers may also be applicable outside the borders of Ontario. The findings of the study were that the primary reason for adoption of Net Zero Energy Homes was the quality of construction and design and that cost, and lack of knowledge were in fact not significant barriers. The sample size for the survey that the findings were based on was small and may have been skewed to those who were already interested in net zero energy homes however the study included some interesting behavioral data and information which is summarized below.

- Residential construction and its supply chain is strongly influenced by builders and their decision making. Their choice of design can have significant impact on energy consumption. These design choices are based on the perception of what home buyers will be attracted to.
- According to the Rogers diffusion of innovation model, attributes required for consumers to adopt innovation include providing an advantage over existing products, meeting consumers' needs and values, associated complexity, ability to test or observe.
- Consumers have concerns about the risks of livability in a net zero energy home (ie: will I be too cold?) and if they will be able to operate and maintain a home with unknown technology.

- Purchases are based on immediate visible costs and not on longer term considerations like energy costs or environmental harm.
- For home builders there is simply too much uncertainty around demand to pro-actively pursue Net Zero builds.

5. [Paving the Road to 2030 and Beyond: Market transformation road map for energy efficient equipment in the building sector](#), NRCan, August 2018

Summary

A report to identify barriers to market adoption of higher efficiency technologies needed to meet the aspirational goals required to meet commitments in the Pan-Canadian Framework on Clean Growth and Climate Change. Additionally, the report provides a roadmap for market transformation of key equipment that was noted as providing the most significant opportunities in the residential sector: windows, space heating, and water heating.

Noted barriers

- Availability of technology, including stage of commercialization
- Insufficient product choice
- Contractors, building owners, designers, and engineers are unfamiliar with benefits of the technology and lacking expertise or not convinced of merits
- High cost deters market demand
- Deemed too risky because there are unknowns about operations or durability

Areas noted for industry lead or support

- Develop construction market pull for high efficiency windows, high efficiency space heating tech, and high efficiency water heating systems
 - NRCan LEEP Program which provides info sessions and demonstrations. This is a model that could be replicated locally
- Education, training, and marketing outreach to support adoption of high efficiency windows (led by industry orgs)
- Facilitate installer training and certification window programs (led by manufacturer orgs, contractors and installers)
- Wide scale demonstrations of CCHP's, gas heat pumps (which can also be demonstrated in commercial buildings)
- Support the development and distribution tools for Canadian sizing and selection
- Heat pump training and contractor certification working with manufacturer orgs
- Improve building designer and contractor awareness and training for advanced water heating systems (residential and commercial)

There were also several R&D initiatives listed and Code and Standards initiatives which were not considered as areas BIX would lead on however it should be considered how BIX will work with partners who work in these areas for a truly collaborative approach. If any of these initiatives are adopted by BIX, the full report should be reviewed for further detail on successfully implementing these initiatives.

6. [Lessons from the Net Zero Challenge, BOMA Canada, 2022](#)

Summary

This report summarizes key lessons learned as part of the BOMA Net Zero Challenge which took place over three years. The lessons highlight barriers that needed to be overcome and an understanding of the opportunities to support commercial building owners and operators.

- Retrofits occur over long periods of time, in phases, to reduce energy use and emissions
- New buildings take an approach of incorporating low energy goals into the design and manage performance through optimization and further upgrades
- Tenant and operator training is an ongoing challenge to address
- Commissioning and recommissioning of high efficiency equipment is very important
- Energy monitoring and reporting does yield results
- Regular evaluation of new, more efficient equipment to identify when replacement is ideal (don't just wait to end of life)

7. [Decarbonizing Canada's Large Buildings: Summary Report, CaGBC, 2021.](#)

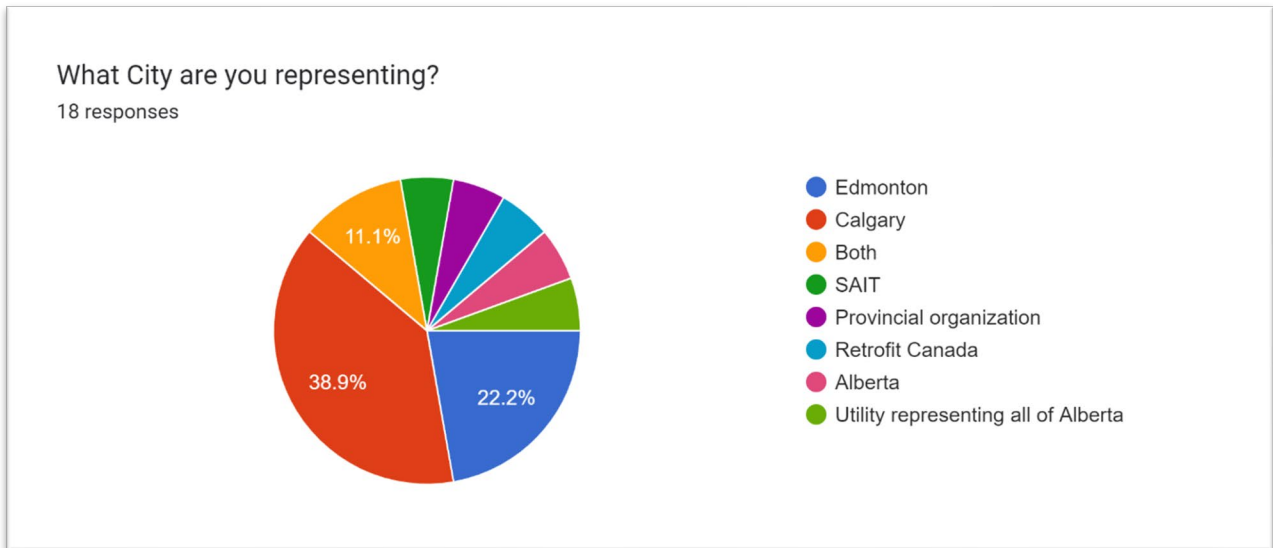
Summary

This report is focused on the retrofits in the commercial building sector and is a summary of the key findings from Decarbonizing Canada's Large Buildings Technical Report. The report looks at the decarbonization opportunities across a large number of archetypes. The report does list a few barriers to large scale deep energy retrofits in the commercial sector however most importantly

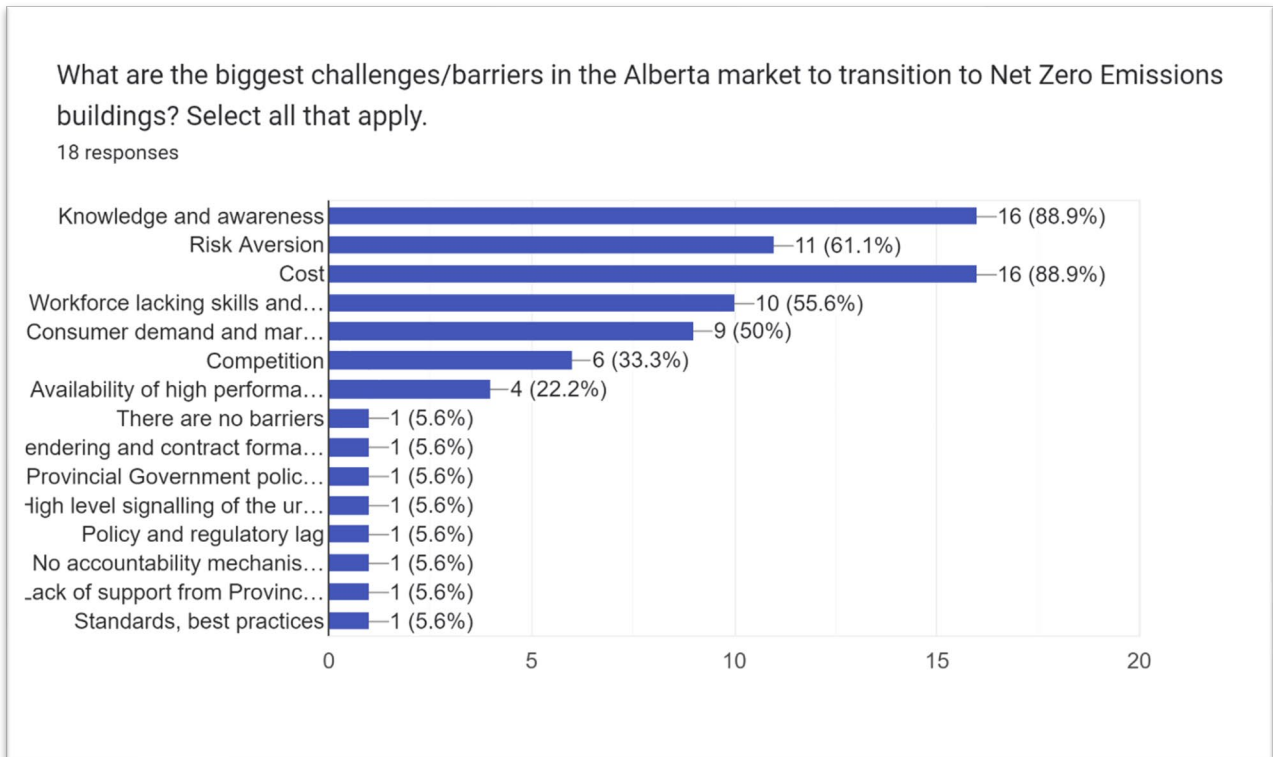
Noted barriers

- Large capital costs with long payback periods which is further burdened with split incentives on cost savings and limited attractive financing options
- Lack of energy and carbon awareness
- Split incentives for cost savings
- Low confidence in project performance results (promised savings from design models are not coming to fruition)

APPENDIX B- Survey Results and Analysis



Based on the other responses, this question was misunderstood. The intent was to understand which location people represented or operated in. When applying the “other” responses to the appropriate location the breakdown was as follows: 44% Calgary only, 33% AB wide, and 22% Edmonton only.



On average participants selected an average of 4.5 barriers in this response. The survey included 8 optional barriers and an additional 7 barriers were added by respondents as part of the “other” option although 5 of those were all related to the lag of regulation and policies (28%)

Additional details and clarifications provided for the challenges and barriers in Alberta to transition to Net Zero Emissions Buildings.

There are no barriers - there are perceived barriers, most significantly risk and cost, that can be addressed with education and awareness.

high performance buildings are held back by economic factors and enabling poor performance

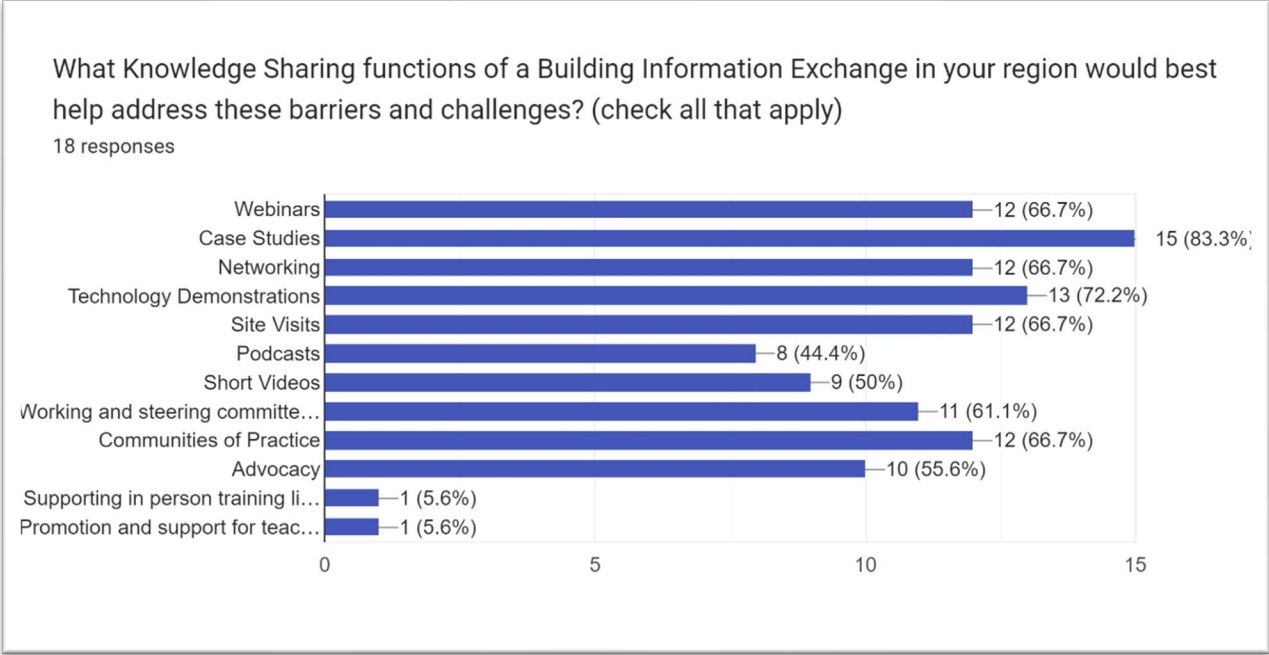
A mix of solutions will be needed. The gas grid is also decarbonizing. There is a general lack of understanding of low-carbon gaseous pathway opportunities such as RNG, hydrogen and hybrid heating solutions. Hydrogen requires the value chain to develop. Opportunities are being hindered slowing down industry due to policy and regulatory lag - e.g. how to deal with incremental costs in the utility system, lack of demand side management unlike elsewhere, etc. Electrification has a role but is not a silver bullet solution and faces capacity, cost and carbon challenges (the 3 C's).

All about knowledge, awareness and attitude as this drives all the other responses here - Too many people think they know why this will not work and are not used to multi stakeholder collaboration as an approach to overcome traditional obstacles

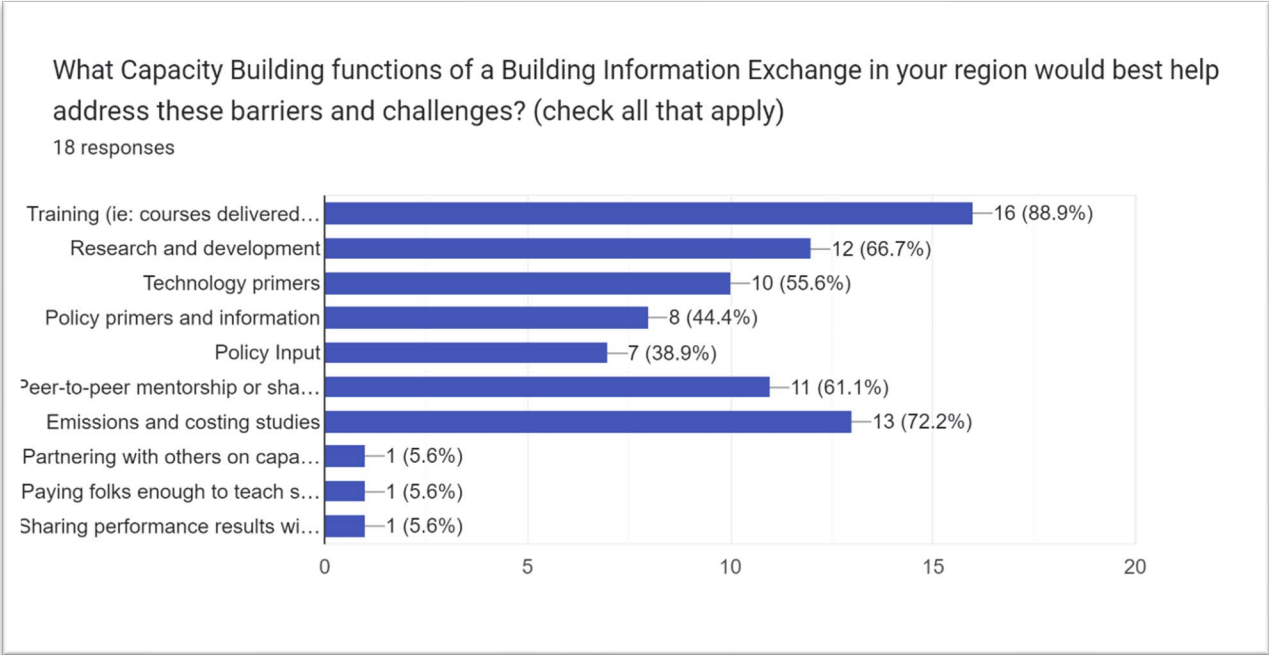
There are very few, if any, Provincial initiatives to construct low carbon, climate resilience buildings. Very few, if any, utility initiatives for lower carbon, climate resilient buildings.

People are risk averse about new technology and its applicability in cold climates. Also concerned about cost and affordability

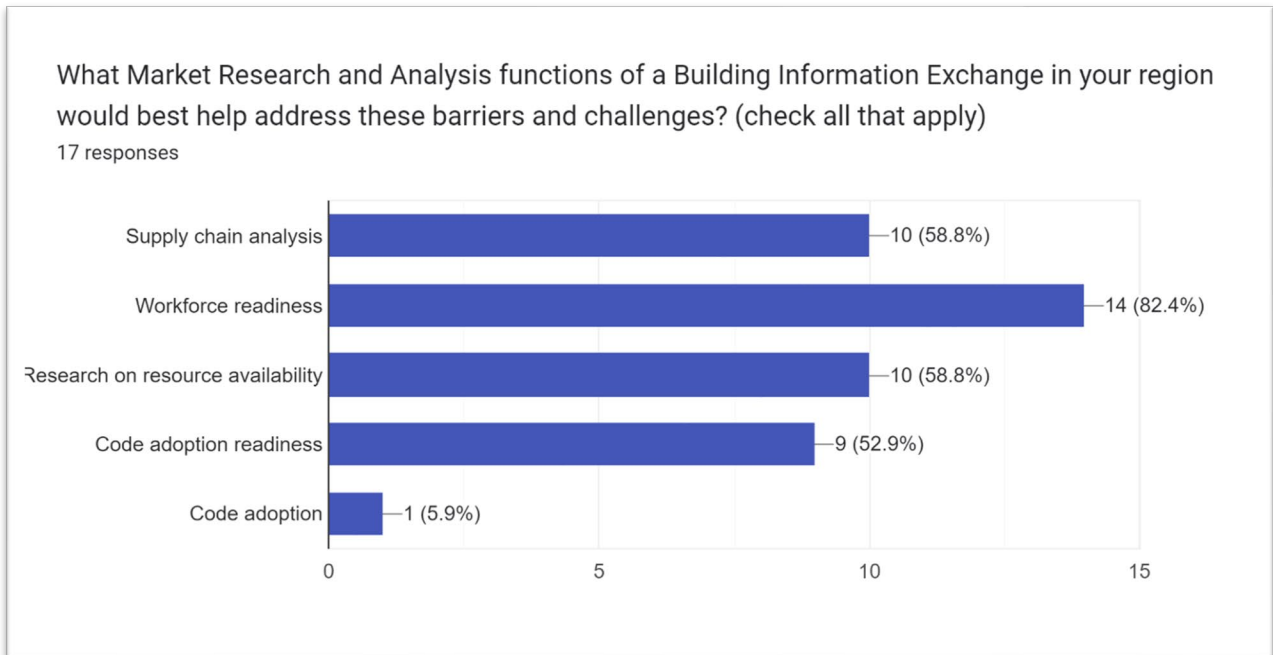
The majority of the comments were not related to technical or even supply issues but rather market factors and a regulatory regime that provides no incentive to make an effort to build Net Zero Emissions Buildings. Alberta's utility system is part of the disincentive to act since it has its own issues in decarbonizing.



There were 10 initial knowledge sharing functions in the question and 2 additional options were included which were both related to supporting the training and knowledge sharing efforts of other groups. On average, respondents selected 7 options.



There were 7 initial Capacity Building options in the question and 3 additional options were included. On average 4.7 options were selected by respondents.



There were 4 options in the question and one additional option was added. On average 2.5 options were selected.

Of the “functions” questions, respondents on average selected more Knowledge Sharing functions than any others. The top three items across all categories based on responses were Training, Case Studies, and Workforce readiness (research and analysis).

Of the Building Information Exchange functions (Knowledge Sharing, Capacity Building, Market Research and Analysis) selected above, please list the top 3 most valuable ways a Building Information Exchange can address your needs.

Case studies, training, policy input

Provide information on the supplies and training needed to build in alberta. Help advocate to the Provincial govt that we can do this. Provide detailed case studies

researching alternatives and costing policy and advocacy for change barrier identification (cost, skills, economic, etc.)

Information sharing that helps demonstrate cost effective ways to reach high efficiency goals and the ROI from the investments. Identifying barriers to high efficiency buildings and working with others to address barriers.

Working committees to knowledge share and remove barriers, Training and workforce readiness...

Hard to prioritize. It all needs to happen at once.

Case studies. Working & steering committees. Policy input.

Giving us the resources to hire teachers at a rate that will be competitive with what they could earn using their knowledge as niche consultants

Cross stakeholder modelling - mutual data collection - results sharing

- 1) Become the hub (credible) place for the building industry to find decarbonizing info 2) Provide easily searchable data that can be downloaded 3) Focus research on identified 'Calgary' issues. Link to generic info from other BIE's

Training, (supply chain analysis, research on resource availability) - I see the last two as similar), costing studies - aim for net zero costs

Produce case studies that identify archetypal "costs to performance", and include the proforma justifications for choosing to build to a higher performance

Garner regional support and participation across Alberta, advocating to the Province for support with market transformation

Build grass-roots demand for higher performance, climate resilient buildings through education and awareness campaigns

Build community capacity; help create and normalize cost-effective low-carbon solutions

Trusted information source of truth, maybe even a research center funded by industry leading innovation & piloting new technologies

The responses to this list were not directly taken from the lists provided earlier in the survey. So they have been categorized as best as possible. All of these are priority items to stakeholders but should be further categorized as BIX "leading", or "supporting" activities of others. There was a total of 15 relevant responses.

Priority Functions	# of mentions	Key words/themes
Case Studies	6	demonstrate cost effectiveness, share results,
Research (non-cost)	3	supplies, training needs, alternatives, barriers to high performance, supply chain, focus on Calgary issues while linking to

		generic issues from others, resource availability
Research on cost	3	pro forma justifications
working committees	2	
Resources to hire teachers	1	
cross stakeholder modeling	1	
Info Hub	2	trusted and credible
training	3	
build community capacity	1	
Advocacy	3	Provincial
data collection and sharing	2	
Get province wide participation	1	
create and normalize cost effective solutions	1	
research centre funded by industry	1	pilot tech and lead on innovation
policy input	2	
Education and awareness campaigns	1	focused on building demand.

40% of respondents believe case studies are a priority outcome, with some noting these need to include information on cost effectiveness. Research was also mentioned 10 40% of responses with half indicating research should be related to cost and the other half on non-cost related items which included quite a large range of items. One note on research was that it should be focused on Calgary specific issues and more generic issues could be information that is pulled from other exchanges. Training was the next highest priority area with 20% of respondents indicating this function in their responses. Advocacy was also mentioned by 20% of respondents which contradicts some advice below regarding avoiding this function.

Are there any functions listed that should NOT be part of a Building Information Exchange in your region and why?

Research unless in partnership with research institutions/post secondary partners

they all seem reasonable

Collaboration is needed where others are already working in an area,

Advocacy for DSM and Energy efficiency integration through utilities could help expedite the need for capacity building of skilled tradespeople and assist in the expedited release of building code upgrades to support.

I don't know

I'm a bit on the fence here - policy/regulatory lag is a current barrier. However, there are potential pitfalls that could bog the work of the exchange down if it becomes overly focused on advocacy

and policy issues. Also, what is meant by "advocacy" and "policy" needs further definition. If "advocacy" is addressing municipal red tape or process issues/gaps, that is appropriate. There may also be a role for policy input and advocacy with the Province, Utility Commission, federal government etc., but that could also take away focus from other areas and bog the exchange down - especially as there may be a range of diverse opinions. However, speaking with a common voice on issues where there is broad consensus could add value and remove barriers (e.g. electrification of passenger vehicles in MURB buildings).

Writing codes – certification

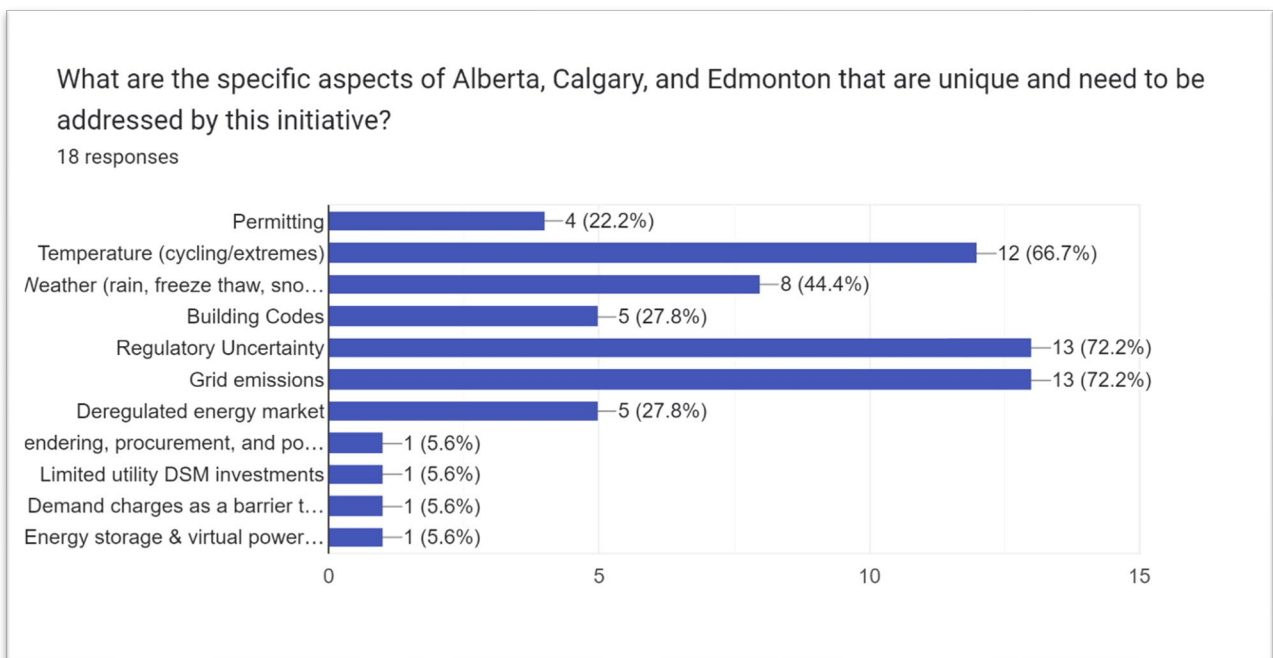
See #3 above

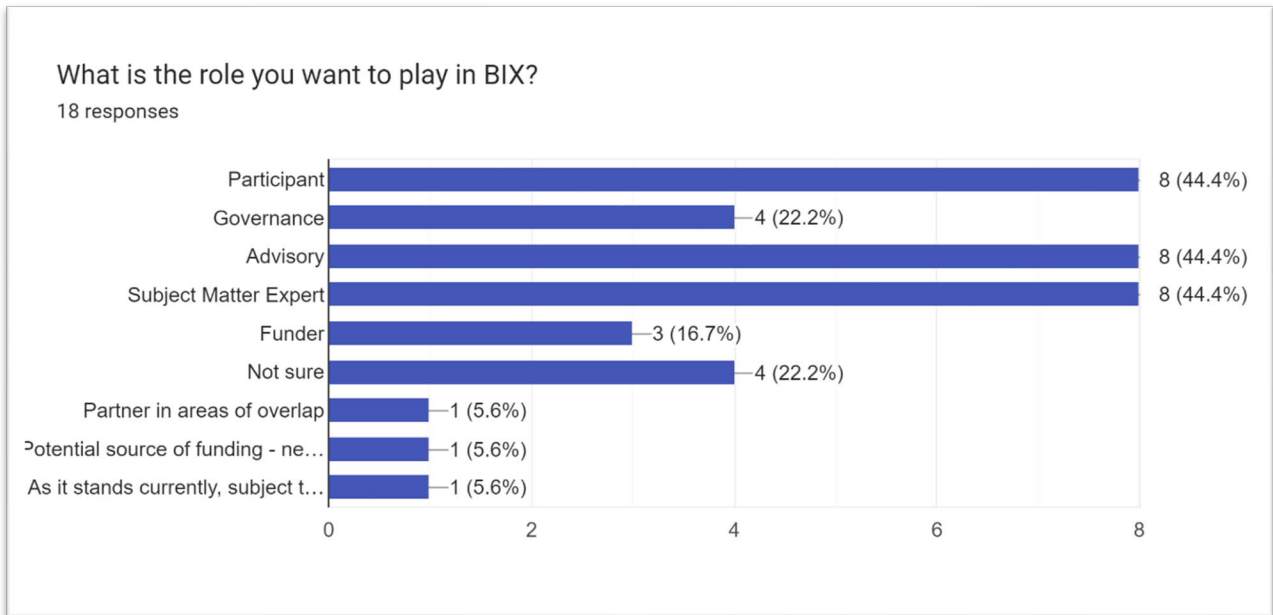
Policy and implementation alignment

Functions should be limited to the consensus "most important", and expanded upon only once goals have been achieved and capacity to grow functionality is evident.

advocacy will be difficult

Clear message not to overlap with work being done by others but to highlight that work and collaborate with those organisations. There were also a few cautions about policy and codes development (which should be avoided) and advocacy as it could be difficult or “bog down” the exchange. If there are areas of broad consensus where speaking with a common voice would remove barriers at the provincial or municipal level, this is seen as valuable.





On average, respondents selected 2 roles from the listed options with the most popular combination being Participant and Subject Matter Expert. This indicates that the stakeholders that were involved in this meeting do view themselves as experts in at least some topics but still looking to participate and continue learning or just being part of this community. With a relatively high number of respondents selecting the advisory role, this is an indication that the right stakeholders are currently involved. However there is still 22% of respondents who are unsure about their role and therefore possibly still unclear about the purpose of the BIX.

Who else needs to be involved in the Building Information Exchange, and in what roles (based on list in question above)?

Utilities as advisory, SME

Large industrial organizations

Builders

I think I would deprioritize this for now. Start small and with the willing - build from there.

Realtors - they share misinformation with home buyers all the time (eg. many mistakenly think natural gas stoves are environmentally friendly)

I think we are good for now - this will evolve with progress

Can't answer until our BIE terms of reference is completed
suppliers,

Provincial representative, AUC

I would think you would want other incumbent utilities on the team (depending on the community). ZEBX in Vancouver did have BC Hydro.

Name ideas or words to be included in the Name

ZebXAB

I like BIX it makes it more approachable to people who are anti green building
 I like BIX or NETBIX Net zero building information exchange
 Let's license ZEBEX- a great name Zebex Alberta?
 I would suggest including language that incorporates low-carbon or net zero.
 It should probably say something about green. It is not clear to me yet how BIX will differ from others who are providing green building knowledge, and serving as green building hubs, so I can't really comment further.
 Building Performance Exchange BPEX - We are already talking about more than just emissions - quality, cost, pro forma, stakeholder, occupants, communities etc all need performance - if there is not better performance across the board this becomes progressively harder - more than just emissions reduction even though this is the big goal
 Needs to be more specific - E.G Building decarbonization information exchange (BDIE)
 tough question - how about "Alberta Building Energy Exchange (ABEX)"
 I like this name!
 It would be good if you could reference a Center of Excellence or Innovation Hub in the name.

Include	Don't include
Low carbon or zero carbon	Green
Green	
Performance (it is more than emissions)	
decarbonization	
Centre of excellence	
Innovation Hub	

There is overall consensus that the name needs to be specific to its purpose and therefore include zero carbon/zero emissions/decarbonization. There was a comment indicating that what we are talking about exceeds only emissions reduction so the focus should be on performance. Based on the policy summary prepared, the local, national and international focus is on emissions reduction therefore there is added value to align with this focus which also then aligns the organisation with potential funders (no one is focused on funding improved building performance).

Appendix E:

Shaping the Exchange

Participants





Shaping The Exchange Participants

This list is of interested parties that attended sessions “Shaping the Exchange” between November 2022 and June 2023.

Overall, there were **51 individual participants** that took part in at least one of the meetings. These individuals represented **28 organizations** in a variety of sectors: owners & developers, constructors/builders, building science, utilities, and government & not-for-profits.

Sector	Organization	Participated? A, 1, 2, 3, L*
Owners and Developers	Commercial Real Estate Development Association (NAIOP)	A, 1, 3
	Building Owners and Managers Association Calgary (BOMA)	A, 2
	Minto Communities	A, 1, 2, 3
	Triovest	A, 1, 2
	Melcor	A, 2, L, 3
	Oxford Properties	L
	Royop	A, 2
	Quadreal	A, 2
	Rohit Group	2
	Ronmor Holdings	3
Constructors / Builders	Calgary Construction Association (CCA)	A, 1, 2, L, 3
	Building Industry and Land Development Association – Calgary Region (BILD)	A, 1, 2, 3
Building Science	Consulting Engineers of Alberta (CEA)	A, 1, 2, 3
	SAIT	A, 1, 2, 3
	EnergSpec Energy Consulting	2
	Williams Engineering	2
	Stantec	2
Utilities	ENMAX	1, 2, 3
	ATCO	1, 2, 3
	Fortis	1, 3
Govt and NGOs	City of Calgary (Council)	A, 3
	City of Calgary (Administration)	A, 1, 2, 3
	Smart Sustainable Resilient Infrastructure Association	A, 1, 2, 3
	Alberta Ecotrust	A, 1, 2, 3
	City of Edmonton	2
	Solar Alberta	2
	Retrofit Canada	2
	Alberta Energy Efficiency Alliance (AEEA)	2

In addition to the roundtables, a diverse number of industry members were interviewed one-on-one; their personal information is confidential.

***Legend**

A	First Meeting	November 29, 2022	Calgary Construction Association Offices	Calgary only
1	Roundtable #1	February 14, 2023	Calgary Construction Association Offices	Calgary only
2	Roundtable #2	March 22, 2023	Online	Calgary and Edmonton
L	Luncheon	May 16, 2023	Calgary Construction Association Offices	Calgary only
3	Roundtable #3	June 1, 2023	Calgary Construction Association Offices	Calgary only