Advancing Deep Energy Retrofits in Alberta

Market Incentives, Training & Skills Development, and Opportunities

2026

Date: October 30, 2026

Presented to: Southern Alberta Institute of Technology (SAIT) & Alberta Ecotrust Foundation (AEF)

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RFS ENERGY ASK

RFS Energy brings people together to propel energy and climate research and planning into action. With over 50 years of combined experience working with non-profits, think tanks, communities, utilities and government agencies across Canada, our team draws from deep on-the-ground implementation experience to translate complex challenges into practical decisions.

ASK* provides creative/lean project leadership services to achieve carbon neutral, net zero/positive energy, and regenerative buildings. ASK* draws on over 20 years of experience in net-zero design, building retrofits and community resilience projects across Alberta.

ACKNOWLEDGEMENTS

RFS Energy and ASK for a Better World wish to thank the Southern Alberta Institute of Technology (SAIT) and the Alberta Ecotrust Foundation (AEF) for their generous support. SAIT is a polytechnic institution in Calgary offering hands-on, industry-focused education and applied research. As a research partner on this project, SAIT is working to understand how post-secondary institutions can help close training and skills gaps in deep energy retrofits and support Alberta's building sector in reducing emissions.

AEF is a charity that leads and catalyzes climate action projects that improve the well-being of Alberta's communities. It works collaboratively with diverse partners to deliver, fund and enable innovative solutions to pressing environmental challenges in the province. Alberta Ecotrust is a founding member of the Low Carbon Cities Canada network, a national initiative accelerating equitable climate solutions in cities. Through the AEF Retrofit Accelerator, Alberta Ecotrust funded this research to assess how Alberta can support the uptake of deep energy retrofits in commercial buildings, by mapping the province's market incentives and training landscape and identifying leading practices from other Canadian jurisdictions.

We acknowledge that this work takes place in Moh'kinsstis, where the Bow and Elbow Rivers meet, now known as the city of Calgary. This is the traditional territory of the Niitsitapi (Blackfoot) and the people of Treaty 7, including the Siksika, Piikani, Kainai, Tsuut'ina and the Îyârhe Nakoda of Bearspaw, Chiniki and Goodstoney, and is also home to the Métis Nation of Alberta, Region 3.

EXECUTIVE SUMMARY

Scope & Approach

Advancing deep energy retrofits (DERs) across Alberta's commercial building sector means closing gaps in financing, workforce development, and institutional coordination, which is the focus of a two-phase research initiative conducted by RFS Energy Consulting & Research Inc. (RFS Energy) and ASK for a Better World (ASK), in partnership with the Southern Alberta Institute of Technology (SAIT) and with support from the Alberta Ecotrust Foundation (AEF) through the AEF Retrofit Accelerator. The research maps Alberta's incentive and training landscape (Phase I), benchmarks it against British Columbia, Ontario, and Nova Scotia (Phase II), and concludes with a gaps analysis and recommendations for advancing commercial DER activity in the province.

The findings arrive at a pivotal moment. Since 2025, the federal government has eliminated the consumer carbon price, and Alberta Infrastructure has removed LEED certification requirements for provincial infrastructure buildings, weakening two of the few demand signals that existed for high-performance buildings. At the same time, record rainfall and repeated flooding this summer, concentrated in Edmonton and central Alberta, caused at least $350 million in insured losses from Alberta-only events[1]. Repair work at this scale can compete with retrofit projects for skilled trades already in short supply. With affordability, housing, and fiscal pressures competing for government attention, the case for durable, non-regulatory pathways to DER adoption is more urgent, not less.

Key Findings

Alberta's Incentive & Training Landscape

Our findings identified 55 market incentives available to Alberta between 2014 and early 2025, with just under half (26) still active as of October 2026. Among all the incentives identified, there were no true incentive programs in Alberta that were dedicated to supporting comprehensive DERs. Government-funded programs made up most incentives, around 80% (i.e., 44), of all identified programs. Financial transparency was identified as a key challenge, with nearly 35% of all programs not reporting maximum possible award values, and almost 60% lacking public-facing details on fund disbursement. Among incentives that did provide distribution details and were open to commercial applicants, over 85% relied on post-project fund distribution. This structure creates a significant barrier for commercial building owners who may not have the capital required to front project costs. Commercial buildings were eligible for only a third of identified incentives, a share that has stayed flat even as overall program availability peaked in 2023 and has since declined. Most consequentially, **Alberta has no regulated demand-side management (DSM) obligation** for its utilities, the mechanism that, in BC and Ontario, generates hundreds of millions of dollars a year in efficiency investment independent of government funding cycles or political will.

[1] Insurance Bureau of Canada (IBC). "Summer Storms across Alberta, Saskatchewan and Manitoba Cause More than $1.8 Billion in Insured Losses." September 22, 2026. https://www.ibc.ca/news-insights/news/summer-storms-across-alberta-saskatchewan-and-manitoba-cause-more-than-1-8-billion-in-insured-losses Figure is the sum of four Alberta-only events; excludes Alberta's share of multi-province events.

Looking at the training and skills landscape, Alberta offers scattered sustainability-related courses but lacks a unified, comprehensive programming key to DER projects. The suspension of key programs offered by NAIT and NorQuest College (e.g., Alternative Energy Technology and Energy Advisor programs) has widened gaps in DER education. Various schools offer programs within architecture, engineering, and construction that provide a general level of education on design, construction, building systems, and sustainability. None seem to offer any specialization or focus on DERs, nor do they cover key topics for DERs such as hazardous materials abatement, demolition and waste diversion, building code requirements, building appraisals, insurance implications and project logistics. Compounding the skills gap are persistent workforce capacity constraints, with many industry professionals reporting limited ability to pursue upskilling due to long work hours and high project demands. Together, these factors indicate a need for more accessible, coordinated, and profession-specific training pathways that reflect the realities of Alberta's design and construction workforce.

The training landscape has recently narrowed further: post-secondary institutions have faced tightening of foreign student enrollment, in addition to higher education funding stagnation. These losses compound a national shortage of skilled trade workers of roughly 20,000 workers a year, made worse in the sustainability niche by the specialized knowledge DER work demands. That shortage is not evenly shared: women make up 15.4% of the total construction workforce in Alberta[2] and only 7% of its tradespeople[3]. Indigenous workers continue to face systemic barriers rooted in workplace culture rather than access to funding alone. This distinction matters because financial incentives for apprenticeship on their own will not close this gap. National providers such as Canada Green Building Council (CaGBC) and Canadian Institute for Energy Training (CIET) offer relevant coursework, but Alberta lacks the direct institutional linkage between training supply and market demand seen in leading jurisdictions.

Jurisdictional Scan of Leading Canadian Provinces

Research indicated that other leading regions in Canada have been advancing DERs through coordinated incentive programs, capacity building initiatives, and performance-based mechanisms. In BC, we see utility and provincial programs layered with regional incentives, complemented by custom retrofit incentives and specialized training offerings. Similarly, Ontario demonstrates utility delivered programming, with additional performance and recommissioning programs for DERs, as well as municipal and non-profit initiatives that can address capital cost needs for multi-residential buildings. Nova Scotia is briefly explored as well, as it has notable DER supports through Efficiency Nova Scotia incentives, ReCover's technical and financial guidance, and an overall emphasis on collaboration and skill development to advance DERs.

British Columbia and Ontario show what a coordinated DER ecosystem can look like. BC Hydro and FortisBC together invested over $232 million in DSM programming in fiscal 2024, including at least $58 million directed at commercial and industrial customers, and BCIT's micro-credentials, which are co-funded by BC Hydro, keep training supply matched to the demand those incentives create. Ontario's Independent Electricity System

[2] Alberta Construction Association. "ACA June Construction Industry Statistics Package." June 19, 2026. https://albertaconstruction.org/2026/06/19/aca-june-construction-industry-statistics-package/

[3] BuildForce Canada. "Employment Demands Increase in Alberta to 2034, with Growth Greatest in the Non-Residential Sector." 2025. https://www.buildforce.ca/en/press-release/employment-demands-increase-in-alberta-to-2034-with-growth-greatest-in-the-non-residential-sector/

Operator (IESO) devoted more than $420 million over four years to commercial and institutional efficiency programs. Nova Scotia's setting combines utility-based performance incentives through Efficiency Nova Scotia with initiatives that provide technical and financial guidance for retrofits, such as the ReCover Initiative and Building to Net-Zero exchange. Alberta has some comparable mechanisms but lacks the scale and coordinated direction that support these more developed environments for DERs.

Recommendations

This report groups its recommendations into three interconnected areas that SAIT and its partners can draw on for advocacy, as different entry points that actors can pursue in parallel, rather than a prescribed sequence:

1. **Strengthen market demand signals:** consistent and dedicated incentives act as a lever for building market demand, signaling to contractors and the workforce that there is sustained work. Local energy efficiency advocacy groups in Alberta could advocate for more dedicated commercial DER pathways, drawing on tiered utility programs such as BC Hydro's business incentives and the IESO's Retrofit Program, which offer prescriptive incentives for smaller projects and custom incentives for larger, more complex ones. Advocacy could also target upfront and performance-based financing, stronger program transparency, and ultimately a regulated utility DSM role.

2. **Build workforce and institutional capacity:**
   - Create a commercial DER credential. Alberta post-secondary institutions, such as Lakeland College, NAIT, NorQuest College, Red Deer Polytechnic, and SAIT, could jointly develop a commercial DER-specific credential or micro-credential pathway, with each delivering the components that fit its existing programs.
   - Use trades programs that are already funded. Post-secondary institutions could embed sustainable design and retrofit content into existing trades programs, which are better funded and less vulnerable to cuts than new standalone programs.
   - Bundle existing national coursework as a near-term bridge. While new programming is developed, training providers could bundle national coursework from CaGBC and CIET into recommended learning pathways for different DER roles, shared through the Emission Neutral Building Information Exchange (ENBIX).
   - Address who gets into the trades, not just how many. Training institutions could partner with Indigenous-led organizations and inclusion-focused non-profits on strategies beyond financial incentives, addressing the systemic barriers that keep women, Indigenous workers, and other equity-seeking groups underrepresented.

3. **Connect the ecosystem:** AEF could continue to strengthen and formalize partnerships among post-secondary institutions, program administrators, utilities, and industry, through mechanisms such as memoranda of understanding, co-funding agreements for training, and credit-recognition arrangements with national providers, so that training supply and market demand reinforce each other.

Collectively, the evidence points to a single underlying diagnosis: Alberta is not simply short on funding programs or training seats—it lacks the enabling conditions, dedicated incentives, accessible financing, a utility DSM role, and coordinated workforce development that let a commercial DER market mature on its own. SAIT and the AEF Retrofit Accelerator are well positioned to use this research as the evidentiary foundation for the policy and institutional conversations needed to build those conditions, even in a political environment where regulatory mandates are receding.

TABLE OF CONTENTS

1. Introduction **8**

Background & Context 8

Building Emissions Reductions Through DERs 8

Importance of Deep Energy Retrofits 9

A Short History of Deep Energy Retrofits 10

Alberta's Emissions & The Built Environment 11

Commercial Buildings & DER Advancement in Alberta 11

New High-Performance Construction 12

Research Goals & Objectives 15

2. Research Approach **18**

Phase I: Alberta-focused Market & Training Analysis *18*

Step I: Review Planning 18

Step II: Criteria Definition 20

Step III: Application 20

Step IV: Recording Results 20

Phase II: Jurisdictional Scan 21

3. Results and Key Findings **23**

Overview of Results 23

Phase I Findings: Incentives in Alberta 23

Challenges and Barriers in TSD for Deep Energy Retrofits 26

Accessibility of Programs 26

Heat Map of Training and Skills Development in Alberta 28

Phase II Findings: Jurisdictional Scan 30

Overview of British Columbia (BC) 30

Overview of Ontario 35

Other National & International Training Programs 38

Overview of Nova Scotia 40

4. Gaps Analysis **41**

5. Recommendations **46**

6. Conclusion **52**

7. Appendices **54**

Appendix I. Phase I Search Terms 54

Appendix II. Phase I Inclusion and Exclusion Criteria 55

Appendix III. Typology of Commercial Buildings 56

Appendix IV. A Short History of Deep Energy Retrofits 57

Appendix V. Jurisdictional Scan Findings (Summarized Version) 58

References 61

INTRODUCTION

Background & Context

In 2019, atmospheric carbon dioxide (CO2) concentrations were higher than at any point in the last 2 million years, while other major greenhouse gases (GHGs), such as methane and nitrous oxide, reached levels not seen in at least 800,000 years.[4] These unprecedented increases are unquestionably the result of human activities dating back to the Industrial Revolution, including fossil fuel combustion, industrial processes, and deforestation. As a result, the trajectory of Earth's climate has been fundamentally altered, with the planet's global surface temperature increasing by about 1.1°C above pre-industrial (1850–1900) levels.

Despite representing only 0.5% of the global population, Canada is one of the largest GHG emitters in the world, having produced 685 Mt CO2 equivalent in 2024, making up 1.4% of global emissions that year. As a signatory to the Paris Agreement, Canada has committed to reducing its emissions by 40–45% below 2005 levels by 2030, with the long-term objective of achieving net-zero emissions by 2050. These commitments have been reinforced through national policy instruments, including the Pan-Canadian Framework on Clean Growth and Climate Change (2016)[5] and its successor, A Healthy Environment and a Healthy Economy (2020)[6]. Buildings in Canada are a significant source of GHG emissions, contributing ~18% of the national total[7]. More than 96% of buildings' emissions arise from space heating, cooling, lighting, and appliance use, while further emissions are embodied in construction materials used in buildings. The impact of buildings on emissions is further compounded by their long lifespan. While a longer lifespan spreads the carbon footprint of embodied emissions over more years, reducing associated annual emissions, it also means that inefficient structures continue to lock in high energy consumption for decades. Given that at least 70% of the buildings that will exist in 2050 have already been constructed, improving energy efficiency in existing buildings is essential for achieving national climate targets and reducing the sector's environmental impact.

Building Emissions Reductions Through DERs

Deep energy retrofits (DERs) are a comprehensive approach to upgrading existing buildings to significantly reduce energy consumption and emissions. Unlike conventional retrofits, which often focus on isolated improvements such as replacing windows or upgrading insulation, DERs take a whole-building approach: an analysis of the building envelope, mechanical and electrical systems, and controls identifies opportunities across multiple systems, which are then addressed together to achieve energy savings of 50% or

[4] Intergovernmental Panel on Climate Change (IPCC). "Summary for Policymakers." In Climate Change 2021: The Physical Science Basis. Cambridge University Press, 2021. https://www.ipcc.ch/report/ar6/wg1/chapter/summary-for-policymakers/

[5] Environment and Climate Change Canada. "Pan-Canadian Framework on Clean Growth and Climate Change: Canada's Plan to Address Climate Change and Grow the Economy." December 2016. https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html

[6] Environment and Climate Change Canada. "A Healthy Environment and a Healthy Economy: Canada's Strengthened Climate Plan to Create Jobs and Support People, Communities and the Planet." December 2020. https://publications.gc.ca/site/eng/9.894532/publication.html

[7] Natural Resources Canada (NRCan). "The Canada Green Buildings Strategy: Transforming Canada's Buildings Sector for a Net-Zero and Resilient Future." Government of Canada, January 21, 2026. https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/canada-green-buildings-strategy-transforming-canada-s-buildings-sector-net-zero-resilient-future

more.[8][9] These upgrades typically include envelope improvements (e.g., air sealing), mechanical system upgrades (e.g., heat pumps), and on-site renewable energy generation. In North America, DERs started gaining attention in the early 2000s and are now recognized as one of the most effective strategies for achieving Canada's net-zero emissions target by 2050. However, challenges such as high upfront costs, long payback periods, and a shortage of skilled labour remain barriers to widespread adoption.

Importance of Deep Energy Retrofits

DERs are central to meeting Canada's climate targets and decarbonizing existing buildings, and their benefits extend well beyond energy savings:

- **Lower Emissions and Energy Costs:** Addressing multiple systems together delivers deeper and longer-lasting reductions in emissions and energy costs than single-measure upgrades.
- **Improved Occupant Comfort and Health:** Occupants benefit from more consistent indoor temperatures, fewer drafts, and better indoor air quality.
- **Greater Resilience:** Upgraded envelopes and building systems help buildings better withstand extreme weather events.
- **Job Creation:** DER projects create and sustain jobs in design and construction, supporting local economic growth.
- **Financial Value:** Lower operating costs, combined with improved comfort, can increase property value and occupant productivity.
- **Reduced Embodied Carbon:** A building's structure accounts for a large share of its embodied carbon and construction cost. Most existing structures can meet today's code requirements, so retrofitting avoids the emissions and cost of rebuilding. The most sustainable building is one that is already built.

Alberta has a surplus of office space and many aging commercial buildings. Retrofitting these buildings would reduce emissions and embodied carbon, support Canada's climate targets, and make older buildings more marketable and attractive to tenants.

[8] Natural Resources Canada (NRCan). "Deep Retrofit Accelerator Initiative Application Guide." Government of Canada, February 16, 2026. https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/application-guide-second-call-applications

[9] Rocky Mountain Institute (RMI). "The Retrofit Depot." 2025. https://rmi.org/our-work/buildings/deep-retrofit-tools-resources/deep-retrofit-case-studies/

A Short History of Deep Energy Retrofits*

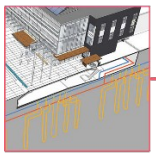


2008
Toronto Tower Renewal PILOT launched

September 2010
Royal Architectural Institute of Canada (RAIC) Committee seeks submissions that are decarbonizing (meeting 2030 Challenge)



2011
Empire State Building retrofit



June 2011
RAIC features 2030 Challenge projects



2013
Willis Tower Retrofit (formerly Sears Tower, Chicago)

August 2014
International Union of Architects adopted the 2050 Imperative



July 2014
First issue of Reimagine Magazine launched by Manasc Isaac Architects



2015
Halifax Seaport Market / Pier 21 Retrofit



2017
MacKimmie Tower, University of Calgary Deep Energy Retrofit (with double skin)

June 2019
AIA Urgent & Sustained Action on Climate Change



May 2025
World Green Building Council: determining Near-Zero Emission and Resilient Buildings (NZERBs)

2006
Architecture 2030 launched by Ed Mazria

2009
LEED Existing Buildings certification launched



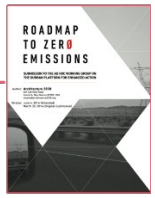
2010
First Canadian Plan (Toronto) begins retrofit- due to failing exterior stone cladding



2011
Avenue on Portage, Winnipeg (office to residential retrofit)



2012
Servus Credit Union - completed a Deep Energy Retrofit in Edmonton, Alberta



2014 June
Roadmap to Zero published by Architecture 2030 & submitted to the United Nations Framework Convention on Climate Change (UNFCCC) 2015 agreement



2014
Five Manhattan West Retrofit - by REX for Brookfield



2015
Toronto Tower Renewal HI-RIS Financing (low interest loan) program



2016
National Arts Centre Retrofit launched, Ottawa



2018
CaGBC releases Roadmap for Retrofits in Canada

2024
Alberta Ecotrust launches the Retrofit Accelerator program



2025
UN Report on Changing Building Codes

**See Appendix IV for additional information and links*

Alberta's Emissions & The Built Environment

Alberta is Canada's highest-emitting province, accounting for 38% of national GHG emissions in 2024 with about 12% of the national population[10]. Most of these emissions come from oil and gas production and other heavy industry, including the large volumes of natural gas used to extract and process bitumen. Industrial emissions are so large that buildings make up a relatively small share of the provincial total: about 8% in 2024, compared with 12% nationally[11]. National and provincial inventories also count electricity used in buildings under the electricity sector, which lowers the buildings share further.

At the municipal level, where electricity use in buildings is included, buildings are among the largest sources of emissions: more than a third of community emissions in Edmonton[12] and about two-thirds in Calgary[13]. As elsewhere in Canada, most building emissions in Alberta come from space heating, cooling, and appliance use, with natural gas as the dominant energy source.

With Alberta's Emissions Reduction and Energy Development Plan aspiring for the province to reach net-zero emissions by 2050, there is an urgent need to ensure that existing buildings are retrofitted to reduce carbon emissions. To meet these net zero emission goals, experts at the Pembina Institute suggest the province needs to retrofit approximately 63,500 homes, 4-6% of its housing stock, each year.[14] However, the current retrofit rates in Canada are below 1% for low-rise residential buildings, and 1.4% of commercial buildings each year, the majority of which are shallow retrofits which do not achieve the 50% energy reduction or 80-100% emissions reduction targets of DERs.

Commercial Buildings & DER Advancement in Alberta

While residential buildings play a critical role in emissions reductions, further attention to the commercial building sector represents a significant opportunity for advancing DERs in Alberta. Commercial buildings, including office towers, shopping centres, industrial facilities, and institutional buildings, are responsible for a substantial portion of urban emissions. In Edmonton, for instance, nearly half of the city's building-related emissions originate from large institutional, commercial, and industrial (ICI) buildings, making them a logical target for decarbonization efforts. Given the scale of these structures, even marginal (and strategic) efficiency improvements can lead to significant reductions in energy consumption and GHG emissions.

A major challenge in retrofitting commercial buildings is the perception of high upfront cost and long payback periods associated with DERs. Shallow retrofits targeting individual measures can deliver 20-25% energy savings with paybacks under 10 years[15], while DERs usually take longer, particularly when only utility savings are counted. In

[10] Environment and Climate Change Canada. "Greenhouse Gas Sources and Sinks in Canada: 2026, Executive Summary." National Inventory Report 1990–2024. 2026.
[11] Government of Alberta. "Alberta's Greenhouse Gas Emissions Reduction Performance." Accessed October 23, 2026. https://www.alberta.ca/albertas-greenhouse-gas-emissions-reduction-performance
[12] City of Edmonton. "Climate Strategies Annual Implementation Update 2024 Report." November 2024. https://www.edmonton.ca/sites/default/files/public-files/ClimateStrategies-AnnualImplementationUpdate2024-Report.pdf
[13] City of Calgary. "Calgary's Climate Change Program." Accessed October 23, 2026. https://www.calgary.ca/environment/policies/climate-change-program.html
[14] Pembina Institute. "New Retrofit Program Set to Accelerate Sustainable Buildings in Alberta." September 24, 2024. https://www.pembina.org/media-release/new-retrofit-program-set-accelerate-sustainable-buildings-alberta
[15] The Atmospheric Fund (TAF). "Improved Business Case Evaluation and Financing Options for Deep Retrofits." 2020. https://taf.ca/custom/uploads/2020/09/TAF-Business-Case-Deep-retrofits_2020.pdf

CaGBC's modelling of 50 large-building archetypes, 45 showed discounted paybacks of more than 15 years[16]. However, DERs can be structured to pay back within 20 years. The City of Toronto's NRCan-funded Deep Retrofit Challenge required participating projects to cut GHG emissions and energy costs by at least 50% with a payback of 20 years or better[17], and the retrofit of 33 Bloor Street East in Toronto is expected to cut emissions by 56% with a payback of just over five years[18]. Early data also suggests DERs may cost less than often assumed: preliminary results from the Purpose Retrofit Accelerator indicate building transition plans could reduce GHG emissions by around 40% by 2030 at an average incremental cost of about $10 per square foot[19].

Payback alone also understates the business case. CaGBC's industry consultations found that many owners assess retrofits on utility savings payback alone, without accounting for the risks of not decarbonizing, such as future regulation, rising utility and insurance costs, and growing tenant and investor demand for low-carbon buildings[20]. Commercial building owners often face complex financial considerations, including lease structures that separate energy costs from property investments, making it difficult to justify capital-intensive retrofits. This split incentive problem, where building owners bear the costs of efficiency upgrades while tenants benefit from reduced energy bills, can act as a barrier to widespread adoption of DERs in the sector. Financial incentives play a crucial role in addressing these challenges. Programs such as grants, tax credits, low-interest loans, and performance-based rebates can make DERs more attractive to commercial building owners by offsetting high initial costs and reducing financial risk. Developing targeted incentive structures for commercial property owners can help drive investment in DERs and accelerate Alberta's transition toward a more sustainable built environment.

New High-Performance Construction

New high-performance construction requires many of the same skill sets as DERs. High-performance construction is synonymous with "zero carbon building" and "net zero energy building." In fact, many of the same strategies of energy conservation measures, integrated building systems and building technologies are used in these new builds. We can extend much of the survey of training and skills development programs to how building professionals learn about design to high-performance building standards which result in zero carbon or net zero buildings.

Architectural and engineering education is a post-secondary degree program that gives professionals a general grounding in how all types of buildings come together, with both residential and commercial typical design and construction techniques. For technologists at trade or polytechnic schools, there is far more particular skills development in how buildings are detailed and focus placed on the tools and processes (i.e., Building Information Modelling, or BIM that enable the design and construction of buildings.) Both trade schools and professional programs have courses on sustainable

[16] Canada Green Building Council (CaGBC). "Decarbonizing Canada's Large Buildings: Summary Report." December 2021. https://portal.cagbc.org/cagbcdocs/advocacy/2021_CaGBC_Decarbonization-Retrofit-Costing-Study_2DEC21_EN.pdf

[17] ReNew Canada. "The Transition to Net-Zero Includes Building Retrofits." 2024. https://www.renewcanada.net/the-transition-to-net-zero-includes-building-retrofits/

[18] SustainableBiz Canada. "Deep Retrofits Should Hit $10 per Sq. Ft. to Hit Net-Zero Goal: Report." March 2026. https://sustainablebiz.ca/deep-retrofits-should-hit-10-per-sq-ft-for-net-zero-by-2050-report

[19] Canada Green Building Council (CaGBC). "Can $10 per Square Foot Result in 40% Carbon Savings?" March 11, 2026. https://www.cagbc.org/news-resources/cagbc-news/can-10-result-in-40-carbon-savings/

[20] Canada Green Building Council (CaGBC). "Rapidly Scaling Canada's Deep Retrofit Market: Stakeholder Insights into Barriers and Opportunities." February 2025. https://www.retrofitsnow.ca/wp-content/uploads/2025/02/CAGBC_Rapidly_Scaling_Canadas_Deep_Retrofit_Market.pdf

design, and students who wish to specialize in aspects of high-performance buildings are likely to find courses that focus on building energy performance, renewable energy, building automation and commissioning.

For architects, engineers, and technologists, it is only when they are employed with architecture and engineering firms where specific on-the-job training can provide them with the process and realities of creating high-performance buildings and that give them exposure to the inter-related nature of architectural practice. In fact, the majority of architectural and engineering firms only design to client requirements that likely stipulate meeting the minimum building code requirements. Many firms still only operate in silos, where architects design a concept, then hand it off to structural engineers to develop the skeleton to hold it up, followed by mechanical engineers to add heating, ventilation, cooling, and plumbing systems, then finally to electrical engineers to provide power, security, information technology. Very few design practices take an integrated workshop approach that brings all the engineering consultants together to co-design a building. In fact, there are many more people that need to be engaged when designing a high-performance building. End-users, building maintenance and operations personnel, and even the constructors would provide value on how to achieve more cost-effective and sustainable buildings.

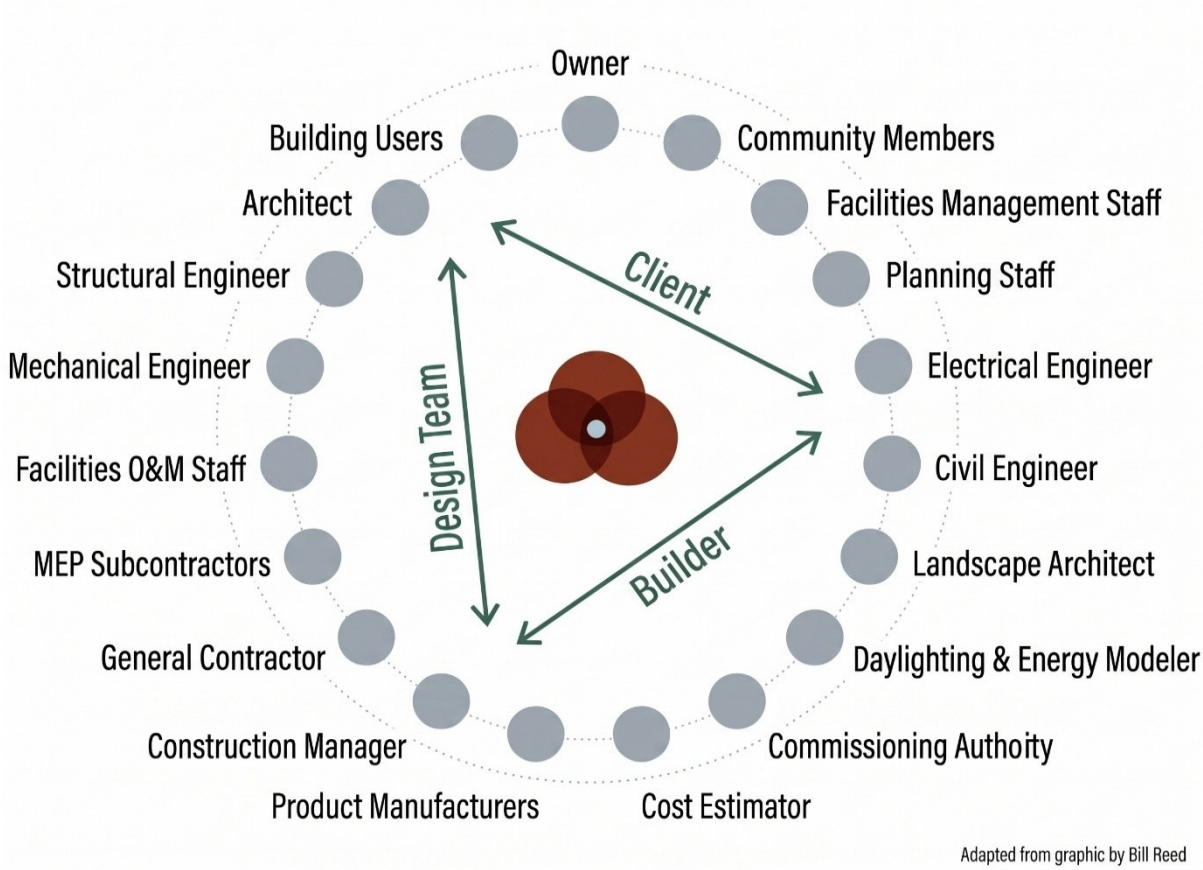


Figure 1: Creating high-performance new construction is a deeply collaborative, team effort. Source: U.S. Green Building Council, LEED Reference Guide for Green Building Design and Construction (2009).

For the last 20 years, Leadership in Energy and Environmental Design (LEED) certification has driven market transformation and the creation of "green buildings." It has also seen municipal, provincial, and federal organizations mandate certification and therefore, higher performing buildings. Unfortunately, policy and government mandates have shifted recently, and many of these organizations have removed certification requirements. For example, in 2025, Alberta Infrastructure removed LEED certification requirements for provincial infrastructure projects.[21] It is only recently with the rise of Canada Green Building Council's "Zero Carbon Building standard" and some grants that have required this standard that re-focused the industry in considering embodied as well as operational carbon emissions in buildings. Yet, the recent elimination of the consumer carbon tax has made some of the financial case of zero carbon buildings more challenging, as the cost of energy and carbon is interlinked. In Alberta, the cost of natural gas is several times less than that of electricity per unit of energy, and this large difference hinders the case for electrification and decarbonization. In regions where electricity is generated by hydro, nuclear and other zero-carbon emissions, the business case for electrification appears to be stronger.

[21] Canada Green Building Council (CaGBC). "Letter to the Honourable Martin Long, Minister of Infrastructure." December 19, 2025. https://www.cagbc.org/wp-content/uploads/2026/01/CAGBC-AdvocacyLetter-Alberta-Minister-of-Infrastructure-2025.pdf

Research Goals & Objectives

The goal of the research has been to assess how Alberta can support the uptake of DERs in commercial spaces. This has included examining how financial incentives and training and skills development programs have evolved within Alberta since 2014. Expanded analysis includes looking at the leading practices from other jurisdictions, such as British Columbia, Ontario and Nova Scotia, which have implemented a range of provincial, regional and utility-led programs.

This data collection of this research has been conducted in two phases, with the first focused on Alberta's previous and existing supports for DERs, with the following phase expanding scope to a provincial comparison to identify best practices applicable to Alberta as the DER market continues to evolve.

Market Incentive Analysis:

(1) Created a database of financial incentives for DERs accessible to commercial building owners in Alberta, encompassing all activities related to improving the energy efficiency and GHG emissions of the building stock.
(2) Assessed similarities and differences between the characteristics of available incentives and examine changes over time.
(3) Explored possible impacts of incentive programs on the DER market in Alberta, as well as the possible impacts of external factors (e.g., political power, international events, etc.) on the incentives available.

Training and Skills Development Analysis:

(1) Analyzed training and skills development programs available to Albertans that have the potential to accelerate DERs.
(2) Identified opportunities for Alberta post-secondary institutions to fill the training gap through new programs and/or certifications.
(3) Identified skills not covered by current programs, and barriers such as cost, location, and admission requirements that limit access to training.

Jurisdictional Scan

(1) Examined the financial incentives, training programs and capacity building initiatives in British Columbia, Ontario, and Nova Scotia relevant to commercial or large buildings
(2) Identified program structures, delivery models and funding mechanisms that have improved DER progress in these jurisdictions
(3) Identified best practices and potential pathways Alberta could adopt to enable DER progress and uptake

This data has been collected and analyzed to provide insight into the enabling factors required to scale up DER efforts across Alberta's commercial building space.

Table 1: Phase I Narrative on Market Incentives and Training and Skills Development Scope

Scope of Work	The scope of the Narrative on Market Incentives (NMI) and Training and Skills Development (TSD) was intended to provide a general characterization of the patterns and trends in market incentives which were available in Alberta for advancing commercial DERs between 2014 and early 2025, with incentive program statuses reviewed again in October 2026.
Exclusions & Limitations	When reviewing, or extracting information from this work it is important to acknowledge the following exclusions and limitations: ● The associated NMI and TSD Databases do not represent a comprehensive list of all relevant market incentives and training programs and courses relevant for commercial DERs. They can instead be used to assess general characteristics of these programs based on available data. ● Only programs which were active between 2014 to 2025 were included in the Databases. Incentive program statuses were updated in October 2026. ● Observations and analysis are based solely on open-source information which was made publicly available on relevant websites or news outlets at the time of data collection.
Terms & Definitions	**Deep Energy Retrofits (DERs)**: Comprehensive approach to upgrading existing buildings to reduce energy consumption by 50% or more, and/or reduce emissions by 80-100%. **Market Incentives**: Programs designed to positively influence the adoption or advancement of DERs. **Financial Incentives:** A category of market incentives with mechanisms to improve the financial viability of DERs, including rebates, grants, credits and loans. **Systematic Review:** A rigorous, structured method of conducting desktop research which ensures comprehensive, reliable, and replicable results. **Theoretical Saturation:** The point in the research process when gathering additional data ceases to provide new insights.

Table 2: Phase II Jurisdictional Scan Scope

Scope of Work	A targeted scan of market incentives and TSD programs in other Canadian jurisdictions to identify practical examples and best practices Alberta could learn or build from. Focus on programming for larger buildings, such as commercial, MUSH, multi-residential and institutional buildings that were active, with publicly available data, at the time of the scan (2025).
Jurisdiction Selection Rationale	All provinces and territories were reviewed at a preliminary level using national directories, including NRCan's Directory of Energy Efficiency Programs and the Retrofit Hub. BC, Ontario and Nova Scotia were then selected for a deeper review because each has an established mix of utility, provincial, and non-profit programming relevant to commercial DERs.
Exclusions & Limitations	When reviewing, or extracting information from this work it is important to acknowledge the following exclusions and limitations: ● The scan is not a comprehensive inventory of all programs in each jurisdiction. ● Nova Scotia is presented through selected examples rather than a full review. ● Investment data is drawn from utility DSM reports in BC and Ontario only. ● Program details reflect publicly available information as of 2025, and some programs have since changed (e.g., CleanBC Commercial Express has paused intake).
Terms & Definitions	**Jurisdictional Scan**: A targeted review of programs and policies in other provinces and territories, used to compare Alberta's landscape and identify practical examples and best practices it could learn from. **MUSH**: Municipalities, universities, schools and hospitals; public-sector buildings often served by dedicated incentive streams. **Prescriptive Programs:** Fixed or calculable incentive amounts for pre-approved equipment or measures, typically suited to smaller, simpler upgrades. **Custom Program / Incentives:** Programming tailored to larger or whole-building projects, with incentives based on each project's estimated savings, often alongside energy manager and assessment support.

RESEARCH APPROACH

Phase I: Alberta-focused Market & Training Analysis

This section outlines the strategies employed by RFS Energy and ASK team members to develop databases, and findings related to:

- Training and skills development (TSD) programs which promote professional development related to DERs in Alberta's commercial building space.
- Financial-based market incentives available to support DERs, and/or associated upgrades, for commercial buildings in Alberta.

In the upcoming subsections, we provide insight into the protocol designed to identify, and collect data from, relevant sources through a systematic search of open-source websites and publications. This methodology allowed RFS Energy and ASK to feel confident that our work had accurately characterized the breadth of current programs and permitted the team to begin identifying any gaps present. Further, the systematic nature of this review provides a high-quality and replicable investigative process, creating a reliable mechanism that can be tested by other researchers, and used as a tool to measure changes over time. In alignment with the recommendations of key researchers with published guidelines for systematic reviews[22][23][24], our review process was structured into four key steps, described in Table 3 below.

Table 3: Systematic Review Activities

Review Planning	Clarifying scope, selecting research questions, tools, and key terms.
Criteria Definition	Defining criteria to guide inclusion/exclusion of results.
Application	Applying review protocol into practice.
Recording Results	Documenting findings and summarizing results of the review.

Step I: Review Planning

Defining Research Scope

To clarify the scope of our work for the Narrative on Market Incentives in Phase I, our team first proposed definitions of key terms which would be used to shape the subsequent research activities. These can be found in Table 1 within Research Goals and Objectives.

[22] Tranfield, D., D. Denyer, and P. Smart. "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review." British Journal of Management 14, no. 3 (2003).
[23] Fink, A. Conducting Research Literature Reviews: From the Internet to Paper. 5th ed. SAGE Publications, 2019.
[24] Stechemesser, K., and E. Guenther. "Carbon Accounting: A Systematic Literature Review." Journal of Cleaner Production 36 (2012).

Various categories of financial incentives were recognized by our team, including but not limited to grants, loans, rebates, and credits. A classification scheme, presented in Figure 2, was used to classify identified incentives within these different categories.

Selection of Research Questions

Establishing research questions at the outset of a systematic review is essential as it provides a clear focus and direction for the study, ensuring relevance and coherence of search results. It helps define the criteria for what sources are considered "important". A well-formulated question makes it easier to synthesize findings and draw meaningful conclusions. For this review in Phase I, there were two guiding research questions:

- What training and skill development programs have been offered in Alberta between 2014 and present which are related to deep energy retrofit activities in the commercial building design and construction industry?
- What financial-based market incentives have been made available in Alberta between 2014 and present to support the implementation of DERs for commercial buildings?

Identification of Relevant Search Platforms

Selecting the proper search platforms is crucial for a systematic literature review to ensure comprehensive, high-quality, and relevant results. Different databases and search engines specialize in various disciplines, publication types, and indexing methods, which can impact the scope and credibility of retrieved sources. Using appropriate platforms helps minimize bias, reduces the risk of overlooking key studies, and enhances reproducibility. Additionally, advanced search functions and filters improve efficiency by refining results, ensuring alignment with the research objectives. Table 4 below outlines the platforms which were used in attempts to answer the above research questions.

Table 4: Search Platforms Accessed During the Review Process

Search Engines	Academic Databases	Industry Websites	Social Media
Google Search Engine Microsoft Bing	Google Scholar Web of Science	Construction Associations Trade Schools Government Portals	LinkedIn Twitter (X) Bluesky

Search Terms & Key Words

Team members undertaking this review created extensive possible key word combinations using terms directly related to either TSD programs, or financial-based market incentives, for commercial DERs in Alberta. A comprehensive list of all key words can be found in Appendix I. The most relevant resulting keyword combinations were entered into the above-mentioned search tools, with the appropriate Boolean operators (or other site-specific features) applied to refine search results.

Step II: Criteria Definition

Inclusion and exclusion criteria are predefined rules that outline the specific characteristics a source must have to be included in or excluded from the final TSD program database. These criteria help ensure the review remains focused on addressing the research question, systematically identifying the most relevant findings. Clearly defining these criteria reduces bias, ensures consistency, and enhances the validity and reliability of the review. A complete set of inclusion and exclusion criteria for both the Phase I: Alberta-focused Market & Training Analysis is provided in Appendix II.

Step III: Application

Systematic Search Protocol

In executing searches for the various combinations of key search terms listed in Appendix I, our team discovered a level of redundancy in the results, with numerous combinations bringing in a large number of the same results. It was therefore determined that, in order to maximize efficiency, the review would rely on a select number of the most relevant combination of select terms which allow the team to reach theoretical saturation (i.e., the point in the research process when gathering additional data ceases to provide new insights). The optimal terms, and the resulting search strategies, were then run through the above-mentioned search platforms.

While it is important for this systematic search to remain unbiased, rigorous, and organized, RFS Energy and ASK understand the importance of ensuring a complete and comprehensive database can be created from its findings. Therefore, team members were encouraged to thoroughly review each identified source for mention of other programs, organizations, or resources which may provide additional relevant information, and follow these leads accordingly.

Step IV: Recording Results

Following the execution of each search, all results were downloaded and stored in labelled folders using the citation management software, Zotero. Team members from RFS Energy and ASK then evaluated each search result against the inclusion/exclusion criteria, to create a final list of relevant sources. Further information on data extraction and categorization can be found in the Market Incentives and TSD Program Databases. The strategies for data collection and organization were advised by direct feedback provided by collaborators at the Southern Alberta Institute of Technology.

Phase II: Jurisdictional Scan

To explore how Alberta can better support DERs, we conducted a targeted scan of incentives and training and skills development (TSD) programs in other Canadian jurisdictions. This scan pulled insights from the regions of British Columbia (BC), Ontario and examples from Nova Scotia as these regions have developed a range of utility-led, provincial government, non-profit led, and regional programs that can support energy upgrades in commercial building spaces. The work was guided by these core research questions:

- What incentives or TSD programs are available to other jurisdictions for commercial, MUSH, multi-residential and/or institutional spaces pursuing DER projects?
- What levels of investment are being seen in these regions by major utilities regarding incentives for commercial, MUSH, multi-residential and/or institutional sectors?

To answer these questions, we reviewed incentives and training programs identified through key national and provincial directories, including the Natural Resources Canada (NRCan) Directory of Energy Efficiency Programs in Canada[25], the NRCan Retrofit Hub[26], and regional directories, such as the Province of British Columbia's Better Buildings Program Incentives for Commercial Renovations search tool[27].

Eligible programs were those explicitly targeting commercial, MUSH, multi-residential, and/or institutional buildings. Data collection and management followed the same structure as the Alberta scan, using the Market Incentives and TSD Program Databases to record program characteristics. For each incentive, we captured the program type, eligibility criteria, funding mechanism, status, maximum award value, and distribution method, drawing from program webpages, incentive manuals, and utility documentation where publicly available.

To understand the level of investment going into DERs, we also reviewed energy efficiency industry reports (e.g., Efficiency Canada's 2024 Canadian Energy Efficiency Scorecard[28]) and utility annual demand-side management (DSM) reports of major utilities operating in the regions of BC and Ontario, such as BC Hydro[29], FortisBC[30], and the Independent Electricity System Operator (IESO)[31]. These utilities were highlighted as they are the primary drivers of commercial-sector incentive delivery in these provinces, and their DSM portfolios provide most of the available program funding. This data was reviewed to

[25] Natural Resources Canada (NRCan). "Directory of Energy Efficiency Programs in Canada." https://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/policy_e/programs.cfm

[26] Natural Resources Canada (NRCan). "Retrofit Hub." https://natural-resources.canada.ca/energy-efficiency/building-energy-efficiency/retrofit-hub/retrofit-hub-funding-incentives

[27] Province of British Columbia. "Better Buildings BC: Find Programs and Incentives" (formerly the Incentives for Commercial Renovations search tool). https://betterbuildingsbc.ca/find-incentives/rebates-and-grants/

[28] Efficiency Canada. 2024 Canadian Energy Efficiency Scorecard: Provinces and Territories. Carleton University, November 2024. https://scorecard.efficiencycanada.org/wp-content/uploads/2024/12/2024-Scorecard-Report.pdf

[29] BC Hydro. "Report on Demand-Side Management Activities for Fiscal 2024." July 15, 2024. https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/reports/2024-07-15-bchydro-dsm-f24-annual-report.pdf

[30] FortisBC Energy Inc. (FEI). "Natural Gas Demand Side Management Program: 2024 Annual Report." Accessed October 23, 2026. https://www.fortisbc.com/about-us/corporate-information/regulatory-affairs/our-gas-utility/gas-bcuc-submissions/fortisbc-energy-inc.-gas-submissions/C-DS-EM/annual-dsm-reports

[31] Independent Electricity System Operator (IESO). "Energy Efficiency in Ontario: 2023 Conservation and Demand Management Results." October 2024. https://www.ieso.ca/Sector-Participants/Energy-Efficiency/2021-2024-Conservation-and-Demand-Management-Framework

help contextualize the incentive programs identified in the scan while also indicating where provinces have created enabling conditions that can support DER uptake.

This scan provided a high-level view of how leading Canadian jurisdictions structure their DER-related incentives and training supports, the scale of investment, and how well they address common barriers to DERs, such as upfront costs, internal capacity, and energy performance. The goal was to highlight practical examples and best practices that Alberta could learn from or build on as its own retrofit market develops.

RESULTS AND KEY FINDINGS

Overview of Results

Phase I of this research looked at the financial incentives and training and skills development programs available in Alberta between 2014 and early 2025. The findings revealed an environment that is limited in supports available for comprehensive DERs, a lack of program information for those incentives available, and a decline in commercial building incentive availability.

As a part of Phase II, a focused jurisdictional scan was conducted to assess regions with stronger ecosystems for retrofit projects through policy alignment, utility collaboration and investment. Ontario offers the closest comparison to Alberta's electricity market. Unlike British Columbia and Nova Scotia, where a single utility generates and delivers most electricity, Alberta and Ontario both have wholesale electricity markets run by an independent system operator. Despite this similar structure, Ontario requires energy efficiency programs to be delivered through its electricity system operator and natural gas utility, while Alberta has no such requirement. Understanding how these jurisdiction's structure and resource their retrofit markets will help in identifying gaps and opportunities within Alberta.

Phase I Findings: Incentives in Alberta

Between 2014 and early 2025, the research team identified 55 unique market incentives available to Albertans as potential supports for DERs or related activities. As of October 2026, the status of these incentives looks like:

- **47% (26)** remain active programs
- **28** programs have been closed or paused
- **1** program has no publicly available updates
- **1** program recently launched in 2025 (Canada Greener Homes Affordability Program) although it has not formally been implemented in Alberta

There has been limited evidence of these incentives being designed to specifically support comprehensive, whole building DERs, especially in the commercial building sector. Instead, most of these programs support incremental efficiency measures or energy related projects, such as lighting, HVAC or water usage technologies, renewable energy projects, or general home repairs instead of retrofit focused pathways.

Incentive Types & Funding Levels: Who Is Offering What?

When looking at the makeup of types of incentives during this study period, the sources were looked at in who was administering and the levels (federal, provincial, municipal, private, non-profit, or jointly) of funding were at, we identified:

- **80% (44 incentives)** were funded by government entities.

- **Municipally funded programs (14)** primarily offered rebate or grant style incentives.
- **Provincially funded programs (15)** that have existed during this period showed a mix of incentive types, including rebates, grants, loans, and even direct installs (e.g., Energy Efficiency Alberta Residential Direct Install program).
- **Federally funded programs (15)** tended to lean more heavily on loan style programs, with a few grant programs deployed since 2014.
- Only **35% (19)** of the incentives identified explicitly stated they were applicable to **commercial buildings**, compared with **62%** for **residential buildings.**
- While the average maximum values were higher for larger buildings (~$492,000 for commercial; ~$393,000 for institutional; ~$249,000 for residential), these amounts were relatively modest for the needs of whole-building DER projects.
- Once outliers were removed (incentives above $2.5 million), the average maximum award value was **approximately $329,000** to successful applicants.

The remainder of incentives are funded by private organizations, nonprofits, or multi-partner collaborations.

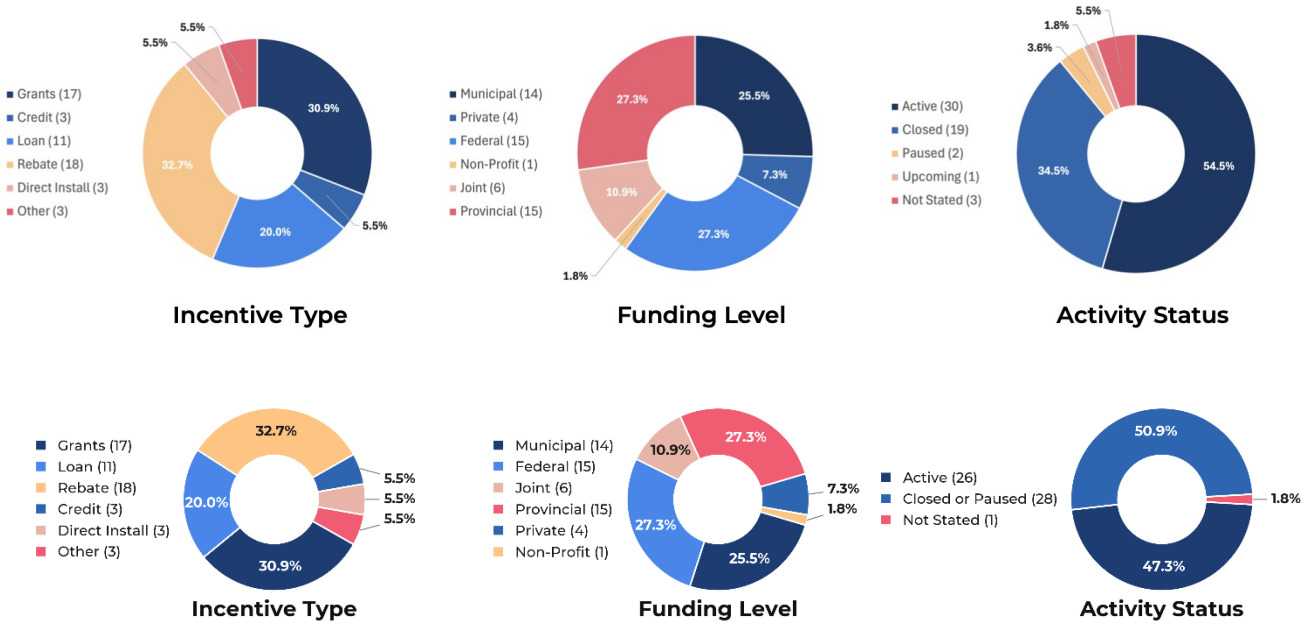


Figure 2: Descriptive Statistics for Understanding Market Incentive Data

Trends in DER Incentives Over Time

Between 2014 and 2023, the number of incentive programs available to Albertans grew steadily, before declining as several provincial and federal programs closed. While program availability peaked in 2023, the overall landscape remains limited in scale and scope, particularly for commercial buildings and comprehensive DER projects.

- Programs available to Albertans grew from 9 in 2014 to a peak of 43 in 2023 (roughly 19% per year), then **declined to 32 by 2026, a drop of about 26%.** Several of these closed or paused during the year, leaving 26 programs open to applicants as of October 2026.
- Programs open to commercial buildings followed the same pattern, growing from 3 to 15 by 2023 before falling to 11 in 2026. **Commercial-eligible programs** have consistently made up only about **one-third of available incentives.**

- **Municipal incentives tend to remain active longer in Alberta,** but they are small in the Canada-wide picture. Of the 14 municipal-led programs active between 2014 and 2025, the average maximum award to a successful applicant was less than $70,000. Provincial incentives are more than 10× higher, but still **modest compared to federal programs**, which can provide up to $5.9 million per project.
- Federal funding plays the biggest role in what's available to Alberta, with the **Government of Canada administering nearly 45%** of all DER incentive programs launched post-2021.

Limitations & Challenges

- Lack of data on maximum funding available - 16 of the identified incentives did not list maximum amounts able to be distributed, while an additional 3 did not include this information as they represented direct installation programs as opposed to financial incentives.
- Outliers in average maximum value calculations – of the available maximum values we found, there was a range from $50 (City of Red Deer's Smart Thermostat Program) up to $25 million (Government of Canada's Green and Inclusive Community Building Program). This required us to set outer thresholds on the incentive value data to flag and remove any value higher than $2.5 million to get a more realistic average.

Challenges and Barriers in TSD for Deep Energy Retrofits

There are many skills required to complete a successful deep energy retrofit, people will require an understanding of the following;

- Building science,
- Building envelope detailing, including glazing and curtain wall technology,
- Energy modelling,
- Building systems and their interrelationships (structural, mechanical, electrical, architectural),
- National Building Code and Energy Code of Canada requirements,
- Local building bylaws / permit requirements,
- Construction logistics and sequencing,
- Embodied carbon/energy & operational carbon/energy,
- Building controls/building management systems,
- Building electrification strategies,
- Heat pumps, including geo-exchange systems,
- Solar photovoltaics and grid-tied connections,
- Off-grid systems and battery technologies,
- Electrical transformers,
- Insurance requirements for climate risk mitigation and
- Financial analysis and understanding of developer proformas.

Accessibility of Programs

After surveying courses and programs for DERs, it is fair to say that there are few barriers to accessing courses due to physical location. As the list of training and skills development programs show, almost all topics /subject matter are available through online course providers. Even post-secondary institutions have online learning options.

When considering the actual physical jurisdiction of training providers, the nation-wide mapping of these courses show definite hot beds in Vancouver, Toronto, Montreal, Ottawa, Edmonton and Calgary. There are some small centre / rural opportunities like Lakeland College in Vermilion, Alberta and Red Deer Polytechnic, but most institutions and providers are in the large cities. This is particularly true when considering Universities that have engineering and architecture schools that have courses particular to DERs.

Some courses in universities will only be offered in engineering or architecture degree programs, and the same can be said for trade schools or polytechnics offering these courses within their diploma programs for architecture or engineering technology. Barriers to accessing these courses will be the admissions requirements and tuition for these programs.

In terms of the cost of courses, there is a wide range from many introductory courses that are free, to multi-day or term-long courses that are just under two thousand dollars. Some courses may be eligible for the Canada-Alberta Job Grant, which can cover up to two-thirds of eligible training costs, to a maximum of $10,000 per trainee.maintenance; to

maintain a professional engineer or registered architect license, for instance.[32] Many employers will provide learning and development budgets for their staff to use for "professional development" as well as credential

There is approximately 75/25% split between residential and commercial related courses. There are far more complexities and topics in commercial buildings such as building management systems, complex controls and commissioning to understand and therefore there are specialized courses developed to address these topics.

[32] Government of Alberta. "Canada-Alberta Job Grant." Accessed November 6, 2026. https://www.alberta.ca/canada-alberta-job-grant.aspx

Heat Map of Training and Skills Development in Alberta

This subsection presents a heat map of Alberta illustrating where DER-related training was offered between 2014 and 2025, along with discussion on the key market segments and interest-holders it serves. The heat map and its underlying data have been shared with project partners, including the Alberta Ecotrust Foundation (AEF) and the ENBIX team, to lead ongoing updates and hosting it publicly on ENBIX's resources page for Alberta training providers and post-secondaries: https://enbix.ca/document/training-and-skills-development-interactive-heat-map/. The interactive heat map highlights the following data for viewers:

Where is Deep Energy Retrofit Training and Skills Development happening?

Training is concentrated in the province's large centres, like Edmonton, Calgary, Red Deer, and Medicine Hat, with Northern Alberta and Fort McMurray notably underserved. Outside Alberta, Vancouver and Toronto are significant hubs producing TSD programming that is accessible to Alberta learners.

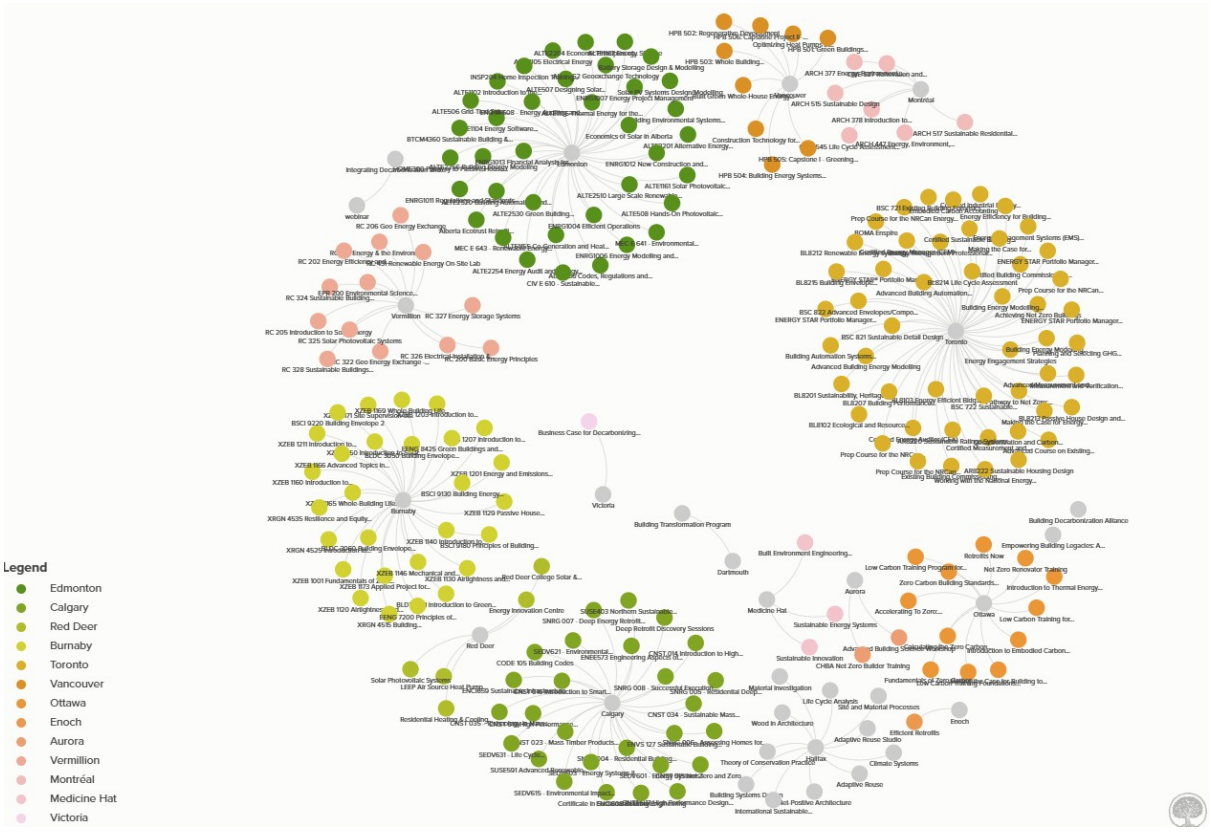


Figure 3: TSD Heat Map (on Kumu) of Programming Organized by Location

Key Demographics:

- *Students in post-secondary institutions (particularly studying architecture, engineering, sustainability).*
- *Professionals/ consultants in the architectural/ engineering industry.*
- *Professional trades people (mostly electricians and HVAC / controls).*
- *General public has access to many introductory courses or short webinars.*

Market Segments:

- Residential programs far outnumber commercial building programs.
- Architectural and engineering schools have a broad sustainability focus, but no specialization in Deep Energy Retrofits.

Market & Industry Skills gaps:

- Demolition & waste diversion, circular economy
- Hazardous materials abatement
- Environmental impact assessments (outside environmental engineering programs and specific testing protocols within trades programs)
- Assessed value/ appraisal
- Qualitative co-benefits: comfort increase from retrofit, air quality, daylight, health
- Insurance benefits
- Pro forma & financials

Who can access training/ where?

- The vast majority of courses and training is still found in post-secondary institutions that offer diploma or degree programs.
- Third-party providers (like CIET) create 1- or 2-day certificate programs or short webinars.
- Almost all programs provided by national bodies like CaGBC, Canadian Construction Association are available online. In some cases, regional (in-person) workshops and courses are made available.

Strengths & Gaps Identified in What Institutions Offer

Most common training & skills program or subject matter include:

- Energy audits, analysis, management, and modelling
- Solar PV design and installation
- Building envelope design
- Understanding of carbon emissions in buildings
- General knowledge of zero carbon buildings
- Passive House Design
- Lifecycle Assessments
- General Sustainable Design practice / fundamentals
- Building Commissioning

Somewhat Common Skills:

- Geoexchange systems
- Embodied Carbon calculations
- Grid-connection
- Mechanical and electrical systems
- Building Rating Systems

TSD Gaps include:

- Structural design / upgrades
- Building controls
- National Building Code Alberta Edition specifics, particularly for retrofits/upgrades
- District energy connections / opportunities
- Energy storage (battery, grid-tied systems, etc.)
- Innovative materials (phase change, vacuum insulation, composites)
- Importance of air and vapour barriers, air tightness/building air-changes

Phase II Findings: Jurisdictional Scan of Leading Canadian Provinces

Across Canada, there is a strong contrast in supports available for Deep Energy Retrofits (DERs), with Alberta operating with a less developed ecosystem. Other provinces benefit from more coordinated and active involvements among utilities, provincial governments, and regional partners in enabling both incremental and deep retrofit activity through incentives, technical assistance, and capacity-building initiatives. As noted in the relevant *Beyond the Meter*[33] report from the Pembina Institute (2025), aligning DSM programs with building retrofit needs can unlock affordable, reliable energy for Albertans while also creating pathways toward deeper, long-term building upgrades.

This section examines the environments of three leading jurisdictions, including British Columbia, Ontario and some innovative examples from Nova Scotia, to highlight the types of financial supports, program structures, and enabling factors that are advancing DERs in commercial, MUSH, institutional, and multi-residential sectors. To get a clearer picture of BC and Ontario, we've referenced DSM investment data from major utilities in the regions to help contextualize the environments we're discussing. Drawing from these regional overviews, best practices have been highlighted from regions such as BC and Ontario to identify what these active regions are doing well to support larger, complex retrofit projects.

Additional to jurisdiction-specific programs, we've outlined a variety of national and international training and skills development initiatives relevant to DER capacity. These examples provide a glimpse of a broader context to understand the level of educational and professional development models that can complement financial incentives and support market readiness for DERs.

Overview of British Columbia (BC)

British Columbia has long been a leader in incentives, training, and skills development for energy efficiency and DERs, reflected in its high-performing buildings and advanced policy frameworks. It was the first province to advance an "Energy Step Code", and many municipal jurisdictions have pushed the envelope on energy performance. For example, City of Vancouver recognizes Passive House as a compliance pathway, and therefore local expertise has grown around this and other sustainable benchmarks. Notably in DER history, Vancouver Island saw the first office building project achieve LEED certification in Canada in the early 2000s. Efficiency Canada recognized this by ranking BC first nationally for energy efficiency in its 2024 Canadian Energy Efficiency Scorecard[34], highlighting the province as a source of best practices for other regions.

BC's supportive ecosystem for DERs is mainly **driven by collaboration and coordination between various actors**. Major utilities, like BC Hydro and FortisBC, can be seen working with provincial initiatives such as CleanBC, which aims to reduce GHG emissions and improve building energy performance. This collaborative programming example, funded by both the province and federal government, is delivered through

[33] Pembina Institute. "Beyond the Meter: Harnessing Demand-Side Management to Power Alberta's Energy Future." October 15, 2025. https://www.pembina.org/pub/beyond-meter

[34] Efficiency Canada. 2024 Canadian Energy Efficiency Scorecard: Provinces and Territories. Carleton University, November 2024. https://scorecard.efficiencycanada.org/wp-content/uploads/2024/12/2024-Scorecard-Report.pdf

utilities such as BC Hydro under the Custom and Custom-Lite Programs and Commercial Express Program. The Custom-Lite and Commercial Express programs specifically target smaller electrification opportunities within commercial and institutional buildings, providing support for energy studies and energy efficiency equipment that reduces GHG emissions.

The province has also offered the Clean Buildings Tax Credit, a temporary refundable income tax credit of 5% of qualifying expenditures for retrofits that improve the energy efficiency of eligible commercial and multi-unit residential buildings

BC Hydro

BC Hydro provides a **mix of prescriptive and custom incentives** that support different levels of commercial and industrial retrofits. The Business Energy-saving Incentives, target common measures such as lighting, refrigeration, and HVAC upgrades, while the Custom Project Incentives are more relevant to DERs, offering project-specific funding for large commercial and industrial facilities. Recent enhancements to these programs, including temporary bonus incentives, signal a growing push to support more ambitious projects. BC Hydro also invests in **capacity-building** through its Commercial Energy Manager program, which provides commercial organizations up to 75% salary coverage (to a maximum of $90,000/year) for on-site energy managers to help organizations pursue comprehensive efficiency strategies, an approach directly relevant to enabling DERs.

FortisBC

FortisBC complements BC Hydro's offerings with an emphasis on natural gas efficiency and electrification alternatives, with relevance to DER projects involving envelope, HVAC, and water heating upgrades. Both **prescriptive and custom incentives are available** through FortisBC programming, along with technical and assessment support across programs. The Custom Efficiency Program is a relevant model for DERs, as it provides significant financial support for studies and implementation, making it a flexible option for larger integrated upgrades. FortisBC also collaborates with BC Hydro on the Free Continuous Optimization Program (C-op), targeting low and no cost building system improvements that can pave the way for deeper retrofits. Additional prescriptive rebates (see below) - covering mechanical systems, water heating, envelope, and sector-specific needs - allow organizations to combine incremental upgrades into broader projects. Like BC Hydro, FortisBC also offers a Commercial Energy Management Program, dedicated to building internal capacity to plan and implement comprehensive retrofit strategies.

The *Performance Program for Existing Buildings* in particular supports DER-relevant activities through energy assessments, retrofit incentives, and access to Continuous Optimization and Strategic Energy Management opportunities delivered jointly with BC Hydro. The program has outperformed expectations, driven by regulatory changes, consultant engagement, and growing interest in advanced DSM projects[35].

[35] FortisBC Energy Inc. (FEI). "Natural Gas Demand Side Management Program: 2024 Annual Report." Accessed October 23, 2026. https://www.fortisbc.com/about-us/corporate-information/regulatory-affairs/our-gas-utility/gas-bcuc-submissions/fortisbc-energy-inc.-gas-submissions/C-DS-EM/annual-dsm-reports

Additionally, FortisBC's Innovative Technologies program, which accounted for $31 million of DSM expenditures in 2024, included Deep Energy Retrofit initiatives targeting reductions of 50% or more in natural gas use and associated GHG emissions. Activities included technology research, pilot demonstrations, and collaboration with industry stakeholders. According to FortisBC, the outcomes of this work are intended to inform future DSM program design, refine savings estimates, and address barriers to adoption.

In particular, FortisBC's prescriptive rebates support targeted upgrades that can either stand alone or contribute to deeper retrofit efforts. These include:

- Mechanical systems & control rebates for space heating, ventilation, and control upgrades (e.g., gas boiler rebates, HVAC controls rebates, radiant tube/unit heater rebates, gas absorption heat pump rebates, dual fuel rooftop unit rebates)
- Water heating & insulation incentives for increasing the efficiency of water heating and for building envelope improvements (e.g., heat pump and electric water heater rebates, pipe and tank insulation rebates)
- Lighting, appliances & equipment rebates to encourage high efficiency lighting and equipment used in specific commercial or industrial settings (e.g., horticultural LED lighting rebates, electric laundry equipment rebates, foodservice equipment rebates, refrigeration equipment rebates)
- Sector-specific support for energy-intensive systems or buildings like agriculture, recreation, and rental apartments (e.g., compressed air equipment rebates, steam trap audits/replacements, variable speed drive rebates, rink de-aerator rebates, irrigation equipment rebates, energy efficiency for rental apartments and accommodations)

With major utilities like BC Hydro and FortisBC offering a mix of supports that range from prescriptive rebates for small upgrades or custom programs for larger projects, along with energy manager and energy assessment initiatives that build internal capacity, there is a lot of opportunity for those pursuing DERs. While not all these incentives are designed specifically for DERs, the options and jointly delivered initiatives ensure there are pathways for those wanting to take on larger retrofit projects.

Utility Investment

The variety of incentive programs in BC sets the province apart as it highlights the scale of investment its utilities are making into energy efficiency and creating DER opportunities. Looking at utility spending data from BC Hydro and FortisBC illustrates a strong commitment to commercial, institutional and residential sectors.

In BC Hydro's most recent Demand Side Management (DSM) filings for fiscal 2024 with the BC Utilities Commission, it was reported that at least **$37 million of the $73 million (approximately 50.6%)** reported Energy Efficiency DSM program expenditures were dedicated specifically to commercial and industrial programming in fiscal 2024 (April 1, 2023 - March 31, 2024)[36]. These programs are a combination of smaller upgrades with more comprehensive, whole building retrofit opportunities and capacity building supports such as embedded energy managers. For 2024, FortisBC reported at least **$21 million of $159 million (approximately 13%)** of the DSM Utility expenditures were dedicated to

[36] BC Hydro. "Report on Demand-Side Management Activities for Fiscal 2024." July 15, 2024. https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/reports/2024-07-15-bchydro-dsm-f24-annual-report.pdf

commercial and industrial programming, including Performance Programs, the Commercial Prescriptive Program, and Industrial Programs[37].

Overall, these numbers demonstrate a prioritization of the commercial building sector as a key area for reducing emissions, pursuing electrification and energy savings in BC. By providing funding for programs that provide various pathways and support for projects, these utilities are creating favourable conditions for DERs through clear market signals, and supporting the systems needed to deliver DERs.

Local Government and Regional Incentives in BC

Beyond these utility led programs, BC is also able to benefit from tax credits and/or regional incentives that support DERs with post-project tax credits or rebates, such as:

- Saanich Climate Action Tax Exemption (CATE) Program - Municipalities like Saanich offer an incentive for electrification retrofits in commercial, multi-unit residential, and mixed-use buildings, in order to encourage space and hot water heating to move to electric. For commercial buildings, between 50-80% of project costs can be exempt.
- Pacific Northern Gas (PNG) - In smaller northern regions (PNG service area includes Prince Rupert and surrounding areas), there are utility led incentives available to commercial and industrial customers that are DER-related, such as:
    - Commercial and Industrial Custom Efficiency Program
    - Commercial Dual-Fuel Space Heating System Program
    - Commercial Efficient Kitchens Program
    - Commercial Boiler Tune-up and Efficient HVAC Controls Program

With this picture of BC incentives in mind, there is strength in the province's approach to be noted which is that support for DERs is layered, coordinated and backed by multiple levels of government and utilities. In contrast, Alberta is still in need to develop this level of depth and consistency. These examples also show how local and regional efforts can fill gaps and take initiative in this space as well.

BC Training & Skills Development Programs

Zero Emissions Building Exchange (ZEBx)

The Zero Emissions Building Exchange (ZEBx) was an idea developed by the City of Vancouver's Green Buildings Team in 2016, when the City launched its Zero Emissions Building Plan. Part of this plan included the creation of a Centre of Excellence to support industry in its efforts to comply with the City's upcoming energy and emissions requirements for new buildings. ZEBx was officially launched in July 2018 as a program of the Vancouver Regional Construction Association (VRCA), with funding support from the City of Vancouver. ZEBx has been the model of Alberta Ecotrust's ENBIX.

[37] FortisBC Energy Inc. (FEI). "Natural Gas Demand Side Management Program: 2024 Annual Report." Accessed October 23, 2026. https://www.fortisbc.com/about-us/corporate-information/regulatory-affairs/our-gas-utility/gas-bcuc-submissions/fortisbc-energy-inc.-gas-submissions/C-DS-EM/annual-dsm-reports

The Zero Emissions Innovation Centre (ZEIC)

ZEIC is part of the Low Carbon Cities Canada initiative that is funded by a federal endowment to help with market transformation for zero carbon buildings. It is the parent organization of ZEBx, and also administers the BC Retrofit Accelerator program. From their website, ZEIC states, "We advance urban climate solutions in the green building, transportation, and renewable energy sectors through (1) education, training, and capacity-building, (2) partnerships and collaborations, (3) granting, and (4) impact investment."

British Columbia Institute of Technology (BCIT)

BCIT is a major centre for technical training and skills development for the lower mainland of British Columbia. Many of its programs have been funded by BC Hydro, to ensure there is industry capacity to deliver many of the electrification programs it has incentivized. BCIT also provides "micro-credential" courses that focus on specializations such as Lifecycle Assessment, Regenerative Buildings, Energy & Emissions Management. Likely due to the rise of City of Vancouver policy, it also provides Passive House and "net zero" training programs.

UBC & the Centre for Interactive Research in Sustainability (CIRS)

Dr. Ray Cole's legacy and research around building science at UBC has made this university one of the most well-known for researching and developing sustainable design best practices. The Centre for Interactive Research on Sustainability (CIRS) at the UBC is a shared space, with a mission to bring people, projects, and ideas together in innovative ways that accelerate sustainability in British Columbia. It is housed in a showcase example of a LEED Platinum building using low embodied carbon construction. UBC has a unique Master of Engineering Leadership in High Performing Buildings program that is particularly for "ambitious architects and engineers aiming to spearhead innovation in the building sector."

Best Practices

In reviewing the jurisdictional scan across provinces, there are several best practices that stand out. Coordinated programming between major utilities (e.g., BC Hydro and FortisBC), provincial initiatives (e.g., CleanBC), with additional regional/municipal programs, can provide multiple pathways for deep energy retrofit projects. A stronger ecosystem in Alberta could be a key approach to advancing DERs, as this can reduce barriers across building types and regions within a province.

Also, delivering custom programs dedicated to larger or whole building retrofits along with energy manager and assessment programs can help support building internal capacity and expertise for those interested in DERs.

Performance-based programs, that also link to available incentives, are another option to encourage a desire for pursuing energy savings. A good example of this is the FortisBC Performance Program for existing buildings.

For Training and Skills Development programs, BCIT provides numerous specializations and micro-credentials that help industry professionals augment their skills and service delivery offerings, such as Passive House certification and understanding of Regenerative buildings. These programs are short and focused on the DER skills required for the commercial building industry.

Lastly, "capstone" or co-operative work experience in educational programs give students real-world experience that makes graduates more employable. These opportunities also connect industry directly to post-secondary institutions and make knowledge sharing and recruiting mutually advantageous.

Overview of Ontario

Ontario has built a broad support framework for incentives supporting large DERs, led by the Crown corporation Independent Electricity System Operator (IESO), among other actors such as Enbridge Gas, and smaller municipally led initiatives like The Atmospheric Fund (TAF) and the City of Toronto. While the province doesn't have a unified climate program like British Columbia's CleanBC, its ability to provide offerings for DER projects in such a large geographic area is noteworthy. Efficiency Canada ranked Ontario sixth in the nation for energy efficiency in their 2024 Canadian Energy Efficiency Scorecard[38], which was a step down from their 2019 third place ranking, but the region is still sitting within the mid-range of other regions scores. A noted strength is that the province has mandatory energy use reporting for large buildings[39], which creates a useful data source for targeting retrofits, benchmarking performance, and verifying savings.

IESO - Save on Energy Programs

The IESO's Save on Energy programming combines incentives and capacity-building programs to support commercial and institutional retrofits. Programs range from prescriptive and custom equipment upgrades to building recommissioning and embedded energy management. Of particular relevance to DERs are:

- The Retrofit Program provides financial incentives for a wide range of prescriptive and custom equipment upgrades for commercial spaces, including lighting, HVAC, and building controls.
- The Energy Performance Program is relevant to deeper retrofits, as it provides incentives determined by verified electricity savings from projects with multiple measures installed in large commercial or institutional facilities.
- The Existing Building Commissioning Program (EBCx) supports commercial building owners with the recommissioning of their building systems, with incentives available for investigation, implementation, and final reporting. This type of support can act as an important precursor to DERs in older buildings.
- The Expanded Energy Management Program (formerly Strategic Energy Management), supported by NRCan, helps organizations embed energy efficiency practices into operations and offers funding to support hiring dedicated energy

[38] Efficiency Canada. 2024 Canadian Energy Efficiency Scorecard: Provinces and Territories. Carleton University, November 2024. https://scorecard.efficiencycanada.org/wp-content/uploads/2024/12/2024-Scorecard-Report.pdf

[39] Government of Ontario, Ministry of Energy and Mines. "Report Energy and Water Use in Large Buildings." Updated August 18, 2026. https://www.ontario.ca/page/report-energy-water-use-large-buildings

managers, similar to BC Hydro and FortisBC jointly delivered program (e.g., Commercial Energy Management Program).

Enbridge Gas

Enbridge Gas also provides those pursuing DERs with options in Ontario with programming focused on natural gas efficiency in commercial and multi-residential buildings. The Commercial Custom Retrofit Program offers tailored incentives for upgrades that go beyond prescriptive measures, including building automation, HVAC improvements, and heat recovery; all relevant for DER projects. Additionally, the Affordable Housing Multi-Residential Program provides incentives for social and municipal housing providers, shelters, co-ops, and eligible multi-residential buildings to adopt high-efficiency equipment. The program includes technical support to guide participants in the planning and implementation of upgrades that can reduce energy use, lower operating costs, and improve overall building performance.

Regional Incentives and Supports in Ontario - City of Toronto & The Atmospheric Fund (TAF)

Outside of utility offered programming, municipal initiatives and non-profit programs provide additional DER support. The City of Toronto is a leading municipal example of retrofit financing and policy support, offering programs that reduce capital cost barriers for building owners:

- The High-Rise Retrofit Improvement Support (Hi-RIS) Program offers funding and technical support for energy and water retrofits in privately-owned, multi-residential buildings, particularly high-rises.
- The Energy Retrofit Loan Program provides low-interest financing for energy efficiency and emissions reduction projects in buildings owned by private, non-profit, or institutional sectors within the City of Toronto.
- The Eco-Roof Incentive Program provides grants for green or cool roof installations, which can contribute to building envelope improvements that could contribute to part of DER project.
- In addition to municipal funding, The Atmospheric Fund (TAF) offers an Energy Savings Performance Agreement (ESPA) model, which enables DERs by providing upfront capital and recovering costs through a share of verified energy savings - removing financial risk and upfront cost barriers for building owners and supporting deeper, performance-based outcomes.

Utility Investment

Ontario's investment in commercial energy efficiency is significant, based on utility energy efficiency reports. This review focuses primarily on major utilities, such as the IESO, as detailed reporting from smaller or municipal utilities is less consistently available, making it difficult to assess province-wide spending with comparable detail.

According to IESO's 2023 Energy Efficiency Report[40], key programs supporting DERs, including the Retrofit Program (Prescriptive and Custom tracks), Existing Building Commissioning Program, Expanded Energy Management Program, and the Energy Manager Program, accounted for a large amount of overall energy efficiency spending. Over a 4-year period (2019-2023)*, **at least $420.5 million, approximately 74% of IESO's $567.8 million** total energy efficiency budget, was dedicated to programming relevant to DER projects for commercial, industrial or institutional customers. This level of investment demonstrates Ontario's strategic commitment to the commercial building sector as a key driver of electricity savings and the support for specific upgrades as well as deeper, performance-based retrofit efforts across a wide range of commercial and institutional buildings.

**Note: At the end of 2023, the IESO 2023 Energy Efficiency Report combined results from both the 2021-2024 Conservation and Demand Management Framework (CDM) and the prior 2019-2020 Interim Framework (IF), as some IF projects extended into 2023 due to COVID-19 delays, causing reporting overlap.*

Ontario Training & Skills Development Programs

Canadian Institute for Energy Training (CIET)

Ontario is also home to the Canadian Institute for Energy Training (CIET), an organization that has provided energy and decarbonization education for over 30 years, with most of the programs available virtually. CIET has created a wide range of courses from short and basic introductory sessions to "certification" of energy managers, commissioning agents and building operators, as well as exam preparation classes. Unlike Post-Secondary institutions, CIET focuses directly on providing very specific topics that create specializations for industry.

Toronto Metropolitan University (TMU)

TMU has a good selection of training and courses that cater to building retrofits. While not as plentiful as BCIT, TMU provides technical training that considers existing building forensics, as well as Passive House design, energy efficiency, lifecycle assessments, and sustainable building rating systems.

Best Practices

- Similarly to BC, incentive programming offered by major utilities that includes a combination of prescriptive, custom, and energy manager support also streamlines DER support and targets different retrofit scales.
- Performance programs that reward buildings achieving energy savings drive the desire for deeper upgrades.
- Programs that are dedicated to building recommissioning for DERs in older buildings, like the IESO Existing Building Commissioning, provide a relevant holistic pathway for more complex projects.

[40] Independent Electricity System Operator (IESO). "Energy Efficiency in Ontario: 2023 Conservation and Demand Management Results." October 2024. https://www.ieso.ca/Sector-Participants/Energy-Efficiency/2021-2024-Conservation-and-Demand-Management-Framework

- Municipally or non-profit led initiatives, like the City of Toronto or TAF, help to reduce capital barriers for DER projects in multi-residential buildings. Exploring opportunities for partnership or bolstering existing efforts in Alberta should be explored for specific regions and building types.
- Similar to BCIT, CIET provides micro-credentials and specialized programs to professionals that can bolster their ability to provide retrofit and energy/carbon reduction services.

Other National & International Training Programs

World Green Building Council

The World Green Building Council (WorldGBC) is an international association of green building professionals that form local and regional chapters. The WorldGBC facilitates property and construction markets around the planet to develop equitable, sustainable and resilient buildings, cities and communities. It advocates for the right policy environments, the right financing environments and the right social and cultural environments to deliver more sustainable and healthy built environments.

Canada Green Building Council (CaGBC)

The Canada Green Building Council is our national extension of the World Green Building Council that can focus on the context of Canadian laws and policies. It provides products and services the building sector needs to construct and manage buildings that are easier on resources, healthier for people, resilient and cost-effective. CaGBC works with the building sector to influence and deliver market-leading standards, establish best practices, and educate the market on the benefits of green buildings.

Architecture 2030

Architecture 2030's mission is to urgently transform the built environment from a major emitter of greenhouse gases to a central solution to the climate crisis. **This organization was first to recognize the need for DERs of all building stock.** For twenty years, Architecture 2030 has provided actions needed to achieve the CO2 emissions reductions for a high probability of limiting planetary warming to 1.5°C. Their primary objectives include:

- Achieve a dramatic reduction in the energy consumption and CO2 emissions of the built environment by 2030, and a complete phase-out of fossil fuel CO2 emissions by 2040; and,
- Advance the development of sustainable, resilient, equitable, and zero-carbon buildings communities and cities.

Building Owners and Managers Association (BOMA) Enspire Program

While not a training program per se, BOMA Enspire is "designed to improve building performance, reduce costs, and enhance energy efficiency. Each initiative provides targeted financial support to implement upgrades that drive long-term savings and sustainability." Much like the Alberta Ecotrust Retrofit Accelerator, it helps building owners find resources and expertise to execute DERs.

ReCover Initiative (Halifax)

The ReCover Initiative is a non-profit organization based in Halifax and serving Atlantic Canada. ReCover connects and collaborates with building owners, communities, and industry to improve the efficiency of buildings in the region. Founded in 2020, the ReCover Initiative was born from a need and commitment to solve the retrofit puzzle, through "design, data, and deep alignment with community and climate realities." It has:

- Facilitated partnerships with retrofit actors in Atlantic Canada
- Formed alliances with fellow Retrofit Accelerators across Canada
- Is engaging in industry capacity-building activities
- Is completing retrofit feasibility studies
- Delivering capacity-building workshops
- Creating job shadowing opportunities for youth in under-served communities
- Exploring software to improve the DER development process

Retrofit Canada (Canada-wide)

Founded by Peter Amerongen with assistance from Sundance Housing Co-op, NRCAN, and The Smart Sustainable Resilient Infrastructure Association (SSRIA), Retrofit Canada is an open-source, DER organization for mainly residential applications. Its mission is "to share solutions, eliminate barriers, and accelerate DERs in Canada to avert a climate catastrophe." Retrofit Canada has created an innovative "open source" model of sharing building details that can help builders cut straight to robust solutions to the very challenging concept of improving single family homes to a higher energy performance standard. Ideas from this program are applicable to commercial buildings.

Built Environment Plus (United States)

Built Environment Plus is the evolution of the USGBC Massachusetts Chapter and is a membership-based community advocating for green buildings at the state and local level. Built Environment Plus provides green building education, networking, advocacy, and leadership opportunities for the sustainable building practitioner community. Their programs have over 150 courses which include introductory course for sustainability, as well as Exam Prep classes for accreditation for green rating systems, and fundamental courses on healthy materials, buildings and carbon, and designing net zero buildings.

Design Council (United Kingdom)

Formerly known as the Commission for Architecture and the Built Environment (CABE), the Design Council is enabling the UK's design community to address the climate

crisis and achieve net zero buildings and beyond, with a focus on making design regenerative and not extractive.

Overview of Nova Scotia

Nova Scotia has demonstrated strong leadership in DERs for large buildings, with notable program models like performance-based incentives and innovative capacity building supports. A few key examples of these programs that offer opportunities for DER project support include:

- Efficiency Nova Scotia's Custom Energy Retrofit Program, which provides performance-based incentives for large commercial, institutional, and industrial retrofit projects. Incentives are calculated at approximately $0.15 per kilowatt-hour saved and are designed to support projects from early-stage planning through implementation, enabling organizations to pursue comprehensive energy efficiency improvements.

  Beyond financial incentives, there are non-incentive initiatives that facilitate knowledge sharing and technical capacity for DERs, such as:

- ReCover's Building Transformation Program (BTP), which offers support to building owners through navigating the DER process and identifying the financial options available to each project. This support is dedicated to DER projects for 4+ storey MURBs, commercial buildings, and institutional buildings.
- The Building to Zero Exchange is a collaborative initiative working in Nova Scotia and the broader Atlantic region to accelerate net-zero building practices by supporting skill development, technical guidance, and collaborative initiatives, while also helping to create enabling conditions through policy engagement and stakeholder coordination.

While smaller in scale than BC, Nova Scotia's combination of financial support and technical capacity-building positions it as a leader in enabling DER projects for large buildings.

Gaps Analysis

Synthesizing the findings from Phase I and Phase II provided a foundation key to identify the gaps and barriers that limit commercial DER adoption in Alberta. The analysis considers how Alberta's policy environment, financial incentives, workforce capacity and training institution coordination influences the conditions for DERs. Drawing from comparisons with leading Canadian jurisdictions, the analysis identifies where Alberta's ecosystem diverges from the enabling conditions of more supportive commercial DER markets.

Gaps in Financial Incentives

Priority Gap 1 — Limited Commercial DER Pathway

Alberta has 55 identified market incentives, but none explicitly designed for whole-building commercial DERs. While the number of available programs suggests an active incentive landscape, they are geared toward **individual technologies** or **incremental efficiency improvements** rather than integrated, multi-measure retrofits. Less than 35% of the identified incentives are applicable to commercial buildings, compared with 62% for residential buildings. This stands in direct contrast to Ontario's Independent Electricity System Operator (IESO) Save on Energy programming, including a dedicated retrofit program[41], building commissioning program[42] and energy management program[43], which provides a combination of pathways for commercial building projects to access support with planning, capacity building, and prescriptive and custom incentives for performance outcomes. The absence of a dedicated DER pathway means commercial building owners must either cobble together multiple programs with separate applications and eligibility criteria or find no pathway at all.

Priority Gap 2 — Post-Project Funding as a Capital Barrier

Over 85% of identified incentive programs available to Albertans use post-project fund distribution: applicants bear the full upfront cost and receive reimbursement afterward. For a commercial DER project where total costs can reach millions, this can be a barrier for projects requiring up-front support. Municipally led property assessed clean energy (PACE) programs exist as loan options in Alberta, but commercial options are available only in Calgary, Edmonton, and Sturgeon County, through the Clean Energy Improvement Program (CEIP)[44]. Anecdotal feedback from building owners and representative associations suggests CEIP loans are not yet compelling enough for project proponents. In some cases, the interest rates offered (e.g., through the City of Edmonton) are similar to or higher than what owners can secure from their own banks, which makes the program's added requirements harder to justify.

[41] Independent Electricity System Operator (IESO). "Retrofit Program." Save on Energy, 2026. https://saveonenergy.ca/For-Business-and-Industry/Programs-and-incentives/Retrofit-Program

[42] Independent Electricity System Operator (IESO). "Existing Building Commissioning Program." Save on Energy, 2026. https://saveonenergy.ca/en/For-Business-and-Industry/Programs-and-incentives/Existing-Building-Commissioning-Program

[43] Independent Electricity System Operator (IESO). "Expanded Energy Management Program." Save on Energy, 2026. https://saveonenergy.ca/For-Business-and-Industry/Programs-and-incentives/Expanded-energy-management-program

[44] Alberta Municipalities. "Clean Energy Improvement Program." Accessed October 23, 2026. https://www.abmunis.ca/products-services/clean-energy-improvement-program

Priority Gap 3 — Absence of a Utility Demand-Side Management (DSM) Role

The most consequential underlying gap is the absence of a regulated DSM obligation for Alberta utilities. In BC, BC Hydro and FortisBC invested over $232 million in DSM programming in fiscal 2024.[45][46] The IESO dedicated over $420 million to commercial and institutional efficiency programming across four years.[47] These investments are required by regulatory frameworks that obligate utilities to pursue cost-effective demand-side resources. Alberta's major utilities operate without such an obligation, and no comparable investment data is publicly available.

Additional Incentive Gaps

Shallow vs. Deep Energy Retrofit Distinction

Alberta has no tiered incentive structure that distinguishes between a single-measure building upgrade and whole-building DERs. Without one, incentives reward the lowest-cost measures rather than deeper savings, leaving owners little reason to pursue whole-building retrofits.

Program Transparency

One-third of programs identified lacked publicly disclosed maximum award values, and more than half do not disclose fund distribution details, limiting the ability to assess the level of financial support available and to make informed investment decisions.

Commercial Incentives Aren't Keeping Pace

Commercial buildings' share of total programs has hovered around one-third (30-40%) since 2014, without growing alongside the broader incentive landscape (Figure 4).

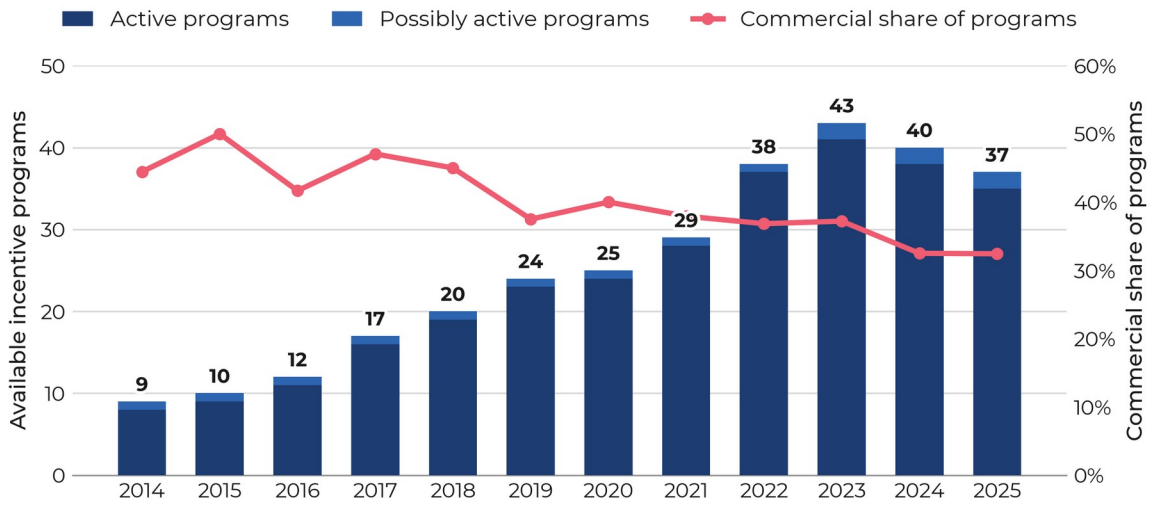


Figure 4: Trends in Number of DER Incentive Programs Over Time

[45] BC Hydro. "Report on Demand-Side Management Activities for Fiscal 2024." July 15, 2024. https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/reports/2024-07-15-bchydro-dsm-f24-annual-report.pdf

[46] FortisBC Energy Inc. (FEI). "Natural Gas Demand Side Management Program: 2024 Annual Report." Accessed October 23, 2026. https://www.fortisbc.com/about-us/corporate-information/regulatory-affairs/our-gas-utility/gas-bcuc-submissions/fortisbc-energy-inc.-gas-submissions/C-DS-EM/annual-dsm-reports

[47] Independent Electricity System Operator (IESO). "Energy Efficiency in Ontario: 2023 Conservation and Demand Management Results." October 2024. https://www.ieso.ca/Sector-Participants/Energy-Efficiency/2021-2024-Conservation-and-Demand-Management-Framework

Gaps in Training & Skills Development

Priority Gap 1 — No Commercial DER Credential or Learning Pathway in Alberta

No Alberta post-secondary institution currently offers a credential or sequenced learning pathway that would equip a professional specifically to lead or deliver a commercial DER project. A DER practitioner needs fluency in building science, energy modelling, integrated systems design, embodied carbon accounting, retrofit-specific financial analysis, and the project logistics of working in occupied commercial buildings.

A critical distinction missing from the current landscape is the differentiation between residential and commercial DER training. Commercial buildings carry an added layer of complexity: building management systems, sophisticated controls and commissioning processes, coordination across multiple trades and project phases, and larger occupant dynamics. A course or credential that addresses residential retrofit fundamentals does not prepare a practitioner for a 10-storey office tower retrofit. Training must also move beyond individual components to address integrated design, meaning the whole-building coordination across architects, engineers, contractors, and trades that is a prerequisite for DER performance outcomes. Understanding cost-benefit analysis at the whole-building level, not just individual measure payback, is a core skill gap that limits how practitioners and building owners approach the retrofit decision.

Priority Gap 2 — Missing Topic Coverage in Critical DER-Adjacent Skills

The Phase I findings identify specific topics absent from Alberta's TSD landscape that are required for DER project delivery:

- Hazardous materials abatement and demolition/waste diversion
- Building appraisals, insurance implications, and assessed value for retrofit projects
- Project proformas and developer financial analysis
- District energy and energy storage (battery systems, grid-tied connections)
- Building controls and building management systems
- Building exterior envelope effectiveness and insulation, air and vapour barrier strategies
- National Building Code Alberta Edition requirements specifically for retrofits and upgrades

Priority Gap 3 — Labour Shortage and Workforce Underrepresentation

The trades sector faces a persistent labour shortage estimated at 20,000 workers per year nationally[48], and the sustainability and retrofit niche competes for a limited pool of workers who also require specialized knowledge beyond standard trade qualifications. This shortage is not evenly distributed: women represent 15.4% of the total construction workforce in Alberta[49], but only 7% of its tradespeople[50]. Indigenous workers face persistent

[48] Department of Finance Canada. "Chapter 2: Benefitting Canadians: A Canada for All." Spring Economic Update 2026. April 28, 2026. https://budget.canada.ca/update-miseajour/2026/report-rapport/chap2-en.html

[49] Alberta Construction Association. "ACA June Construction Industry Statistics Package." June 19, 2026. https://albertaconstruction.org/2026/06/19/aca-june-construction-industry-statistics-package/

[50] BuildForce Canada. "Employment Demands Increase in Alberta to 2034, with Growth Greatest in the Non-Residential Sector." 2025. https://www.buildforce.ca/en/press-release/employment-demands-increase-in-alberta-to-2034-with-growth-greatest-in-

barriers rooted in colonial workplace cultures that have not been meaningfully reformed despite recognition of the problem.

Federal initiatives are attempting to address the labour shortage. Through Team Canada Strong, the federal government has committed up to $6 billion over five years to recruit, train, and hire new Red Seal trades workers, including wage subsidies for employers who hire first-year apprentices, income top-ups for apprentices during in-class training, completion bonuses, and funding to encourage more young Canadians to enter the trades[51]. However, demographic data suggests these efforts will be insufficient without corresponding action to reform the workplace culture that drives underrepresentation. Financial incentives alone do not address the cultural and systemic barriers that prevent women, Indigenous and visible minority workers from entering and staying in the trades. The quiet retreat of diversity, equity and inclusion (DEI) initiatives at the organizational and government level removes a mechanism that, however imperfect, was creating pressure for workplace culture change.

Organizations like Green Buffalo and Four Winds & Associates, both delivering programs under DRAI, demonstrate that Indigenous-led approaches to DERs are both technically effective and economically valuable, while creating employment within communities. Non-profits like EnviroCentre's Build work to create more inclusive workplaces for new tradespeople. These organizations are doing essential work, but they remain vulnerable to shifting funding priorities and are not a substitute for broader reform.

Priority Gap 4 — No Institutional Linkage Between Training Providers and DER Market Demand

In BC, partnerships such as the one between British Columbia Institute of Technology (BCIT) and BC Hydro create a direct linkage between the market and the training system: utility incentive programs generate demand for skilled practitioners, the utility co-funds training, and trained graduates deliver the programs that generated the demand. Alberta has no equivalent mechanism. NAIT's suspension of its Alternative Energy Technology diploma and NorQuest's suspension of its Energy Advisor program removed two of the province's most relevant TSD offerings without replacement, a loss that reflects the vulnerability of training programs that are not formally connected to market demand.

A loss of specialized training capacity is also visible in a broader pattern: changes in government spending priorities, stagnant post-secondary funding, and limits on international students have collectively reduced the financial base for sustainability-focused programs. NAIT is one of the leading providers of skilled trades training by volume in Alberta; the gravity of losing 18 programs, including those directly relevant to clean energy and building systems, cannot be overstated for the province's retrofit workforce pipeline.

Cross-Cutting Themes

- **The coordination gap:** Alberta only recently started with an integrating body equivalent to BC's Zero Emissions Innovation Centre (ZEIC). The Alberta Ecotrust

the-non-residential-sector/

[51] Department of Finance Canada. "Chapter 2: Benefitting Canadians: A Canada for All." Spring Economic Update 2026. April 28, 2026. https://budget.canada.ca/update-miseajour/2026/report-rapport/chap2-en.html

Retrofit Accelerator is the closest current equivalent, and ENBIX, modelled on BC's ZEBx, signals meaningful momentum. Coordinating function depends on having *both incentive programs and training supply* to connect building owners and practitioners to real and viable projects.

- **Policy uncertainty and competing priorities:** The concurrent pressures of affordability, housing demand, and fiscal constraint divide government attention and erode political will for climate-focused investment. These conditions make purpose-built programs and training pathways more important, not less. They also signal that industry and institutions may need to lead where government has stepped back. Also, the extreme weather and climate emergencies experienced in Alberta during the summer of 2026 can divert attention from long-term policy development toward immediate needs.

Recommendations

The following recommendations are grounded in the Phase I research findings and Phase II jurisdictional scan evidence to identify potential pathways to advance commercial DER activity and provide additional evidence to support SAIT and its partners' ongoing advocacy with government, utilities, and post-secondary institutions.

Three areas of recommendations emerge from the research:

Recommendation Area 1: Strengthen the Conditions for DER Market Growth

Strong incentive programs do more than fund individual projects; they provide the certainty that enables markets to mature. When incentives are consistent and sustained, they generate market demand that encourages contractor specialization, increased training enrolment, and investment in workforce development. Evidence from BC and Ontario suggests that these enabling conditions can support the market activity needed to strengthen the DER ecosystem. For Alberta, this points to the importance of advocating for sustained incentives and workforce supports that can help build the market conditions needed for commercial DER growth.

1a. Advance Advocacy for Stronger Policy and Regulatory Signals in Alberta

A key opportunity for advancing commercial DERs in Alberta is establishing a stronger role for utilities in delivering energy efficiency and DSM programs. A DSM utility role could provide greater certainty for building owners, contractors, and other market actors while supporting economic competitiveness, grid resilience, and emissions reduction goals. This role should be considered alongside broader policy and regulatory signals that create sustained demand for energy efficiency and DERs. The jurisdictional scan identified policy and regulatory mechanisms in other provinces that provide greater direction for energy savings and clean energy investment, while Alberta currently has fewer comparable market signals. Evidence from other jurisdictions can inform advocacy and discussions with provincial government, utilities, and other stakeholders.

One priority is accessible commercial DER financing. Alberta has existing mechanisms to support commercial energy efficiency and DER projects, such as CEIP and other municipally led programs, but their reach and attractiveness remain limited. CEIP is active in over 25 Alberta municipalities, but only three (Calgary, Edmonton, and Sturgeon County) offer it for commercial properties[52]. Financing rates may also not be sufficiently competitive to motivate investment. Advocacy should emphasize the need for financing options that are broadly accessible across Alberta and sufficiently attractive to help overcome the upfront capital barriers associated with commercial DER projects.
Relevant models include tiered utility programs, such as BC Hydro's business incentives and the IESO's Retrofit Program, which provide different pathways based on project complexity and level of project development. Other approaches, such as the Toronto

[52] Alberta Municipalities. "Clean Energy Improvement Program." Accessed October 23, 2026. https://www.abmunis.ca/products-services/clean-energy-improvement-program

Energy Retrofit Loan and The Atmospheric Fund's ESPA model, demonstrate ways to address upfront capital barriers through accessible financing or repayment linked to project savings.

1b. Enable Informed Investment in Commercial DERs

Commercial building owners require credible information to assess the costs and benefits of DER projects. Incentive programming available to Alberta should improve transparency by providing maximum award values, fund disbursement data, and applicant outcomes. Continued efforts to build and share the evidence base for commercial DERs can help demonstrate their broader value beyond energy savings and reduced emissions. This can include relevant non-energy benefits (NEBs), such as improved occupant comfort and indoor air quality, reduced operations and maintenance needs, and improved building resilience. Strengthening access to this information can enable building owners, contractors, and investors to better assess the strategic value of DERs.

Next Steps *Continue and strengthen advocacy for DER*

To begin advancing these recommendations, the following near-term actions are suggested:

- Share this report's evidence on gaps in Alberta's commercial DER incentive and financing landscape and highlight relevant approaches from other jurisdictions.
- Conduct further research with commercial building owners and other relevant market actors to validate and expand on the identified gaps and assess the relevance of potential incentive and financing approaches explored in this work.
- Identify areas of collaboration with other ecosystem partners discussing the role of DSM in Alberta (Pembina Institute, AEEA) to construct financial pathways or strengthening existing financial mechanisms suited to Alberta right now.
- Highlight the role of regulatory frameworks, utility led financial incentives, provincial government guidance and political will to push forward the DER market.
- Encourage greater transparency in incentive program data, including award values, funding disbursements, and project outcomes, to strengthen the evidence available to market actors.

Actors: SAIT, AEF, Pembina Institute, Alberta Energy Efficiency Alliance (AEEA), other partners (BOMA, Construction Associations)

Recommendation Area 2: Building Workforce and Institutional Capacity

Training capacity is only sustained when incentive programs create consistent demand for skilled practitioners. The workforce and institutional recommendations below are most effective when pursued in parallel with the demand-side work above, not as a standalone training initiative. Addressing the workforce gap also requires going beyond financial incentives to tackle the systemic and cultural barriers that keep visible minorities, women and Indigenous workers underrepresented in the trades.

2a. Develop a DER-Specific Credential or Micro-credential Pathway

Alberta post-secondary institutions, such as Lakeland College, NAIT, NorQuest College, Red Deer Polytechnic, and SAIT, could jointly develop a commercial DER-specific credential, with each delivering the components that fit its existing programs.

A DER-specific micro-credential, similar in nature to BCIT's model of specialization-focused short programs, would address the most critical practitioner gaps: energy modelling, building envelope science, integrated systems design, and DER project delivery. Role-based bundling ensures different professionals receive the knowledge they need without requiring a full degree or diploma. Course development should prioritize the specific competency gaps identified in Phase I: building science fundamentals, hazardous materials abatement, building appraisals and insurance, pro forma and developer financial analysis, building controls and BMS, district energy, energy storage, and National Building Code Alberta Edition retrofit-specific requirements. New programming should explicitly differentiate between residential and commercial DER contexts, as very different professional and trades work on these two types of buildings.

2b. Expand and Embed Sustainable Design in Existing Trades Programs

Rather than relying solely on new standalone programs, which remain vulnerable to shifting resources, weak political will, and volatile public opinion, a complementary strategy is to embed sustainable design content into existing trades programs that are increasingly well-funded. Through Team Canada Strong, the federal government has committed up to $6 billion over five years to recruit, train, and hire new trades workers[53]; programs in mechanical, construction, energy, and electrical trades will be training students in skills directly relevant to DER work. Advocating for sustainable design and retrofit-specific content to be integrated into these existing programs offers a more durable path than founding parallel programming and can be framed as future-proofing students' skillsets.

This approach also creates synergy with AI-adjacent training initiatives, which are currently attracting significant government funding. The introduction of AI tools for building energy modelling, retrofit planning, building automation and commissioning presents an opportunity to align sustainable design objectives with already-funded program streams — an example of the multidisciplinary, multi-grant approach that is best suited to the current constrained funding environment.

[53] Department of Finance Canada. "Chapter 2: Benefitting Canadians: A Canada for All." Spring Economic Update 2026. April 28, 2026. https://budget.canada.ca/update-miseajour/2026/report-rapport/chap2-en.html

2c. Leverage Existing Training as a Near-Term Option

Even before new programs are developed, existing courses from national providers like Canada Green Building Council (CaGBC) and Canadian Institute for Energy Training (CIET) could be reviewed and grouped into recommended learning pathways for different types of DER practitioners. This would give learners a clear starting point while new programming is under development.

2d. Address Systemic Barriers to Workforce Inclusion

Federal and provincial financial incentives for apprenticeship training address affordability barriers but are insufficient on their own. Demographic data is clear: women represent only 7% of tradespeople in Alberta[54], and Indigenous workers face persistent systemic barriers rooted in colonial workplace cultures. Organizations like Green Buffalo and Four Winds & Associates demonstrate that Indigenous-led approaches to energy retrofitting are both technically effective and economically valuable, while creating employment within under-served communities. Non-profits like EnviroCentre's Build work to create more inclusive workplaces for new tradespeople.

Advocacy should push beyond financial incentives to include:

- Partnership with Indigenous-led training organizations;
- Deliberate program design to reduce cultural and systemic barriers for underrepresented groups;
- Recognition that the quiet retreat of DEI initiatives removes mechanisms that — however imperfect — create pressure for workplace culture change. The DEI retreat may reduce bureaucratic friction, but it threatens the ability to grow the sector at the scale required.

Next Steps *Expand workforce supports & training*

To begin advancing these recommendations, the following near-term actions are suggested:

- Share this report's identified competency gaps (building science fundamentals, hazardous materials, building appraisals/insurance, controls and BMS, energy storage, etc.) with existing training providers and post-secondary partners to inform near-term curriculum updates.
- Explore the feasibility of course bundling with existing national provider content (e.g., CaGBC and CIET courses), while Alberta post-secondary institutions develop DER-specific education and credential options.
- Convene conversations with Indigenous-led training organizations and inclusion-focused non-profits, such as Four Winds & Associates, to explore partnerships that address systemic barriers to workforce diversity.
- Conduct further research with industry, Alberta training institutions, national training providers, and workforce organizations to validate the workforce gaps

[54] BuildForce Canada. "Employment Demands Increase in Alberta to 2034, with Growth Greatest in the Non-Residential Sector." 2025. https://www.buildforce.ca/en/press-release/employment-demands-increase-in-alberta-to-2034-with-growth-greatest-in-the-non-residential-sector/

identified through this work and explore further workforce development needs for supporting DER delivery.

Actors: Alberta post-secondary institutions (including Lakeland College, NAIT, NorQuest College, Red Deer Polytechnic, and SAIT), Construction Associations, Association of Professional Engineers and Geoscientists of Alberta (APEGA), Association of Science and Engineering Technology Professionals (ASET), Consulting Architects of Alberta, Canada Green Building Council, Green Buffalo, Four Winds & Associates, and Alberta Advanced Education.

Recommendation Area 3: Connecting Alberta's Ecosystem and Market Actors

The central gap across both the incentive and training sectors in Alberta is the limited coordination between the two. Financial support and workforce development are often pursued independently, limiting their ability to reinforce one another and support sustained DER market growth. Strengthening connections among post-secondary institutions, advocacy organizations, industry, and provincial government could help advance training options and emerging market demand.

3a. Strengthen Partnerships and Coordination Across Alberta's DER Ecosystem

In Alberta, stronger connections among post-secondary institutions, utilities, program administrators, industry, and market intermediaries could similarly help align training supply with market demand. The BCIT and BC Hydro partnership provides a useful example of how utility incentives and workforce development can reinforce one another: incentives create demand for skilled practitioners, while training investments help build the capacity needed to deliver those programs.

Initiatives such as AEF's Retrofit Accelerator and ENBIX demonstrate that coordination pathways already exist within Alberta's DER ecosystem. ENBIX's connections with building owners and industry groups such as Building Owners and Managers Association (BOMA), Commercial Real Estate Development Association (CREDA, formerly NAIOP), and others (e.g., Efficiency Canada) offer opportunities to continue advocating for retrofits.

Building on these existing networks and relationships could further strengthen connections among building owners, program administrators, post-secondary institutions, training providers, and other market actors, while improving access to incentives, training opportunities, and market information. These connections could be formalized through memoranda of understanding and co-funding agreements in which utilities or industry support training aligned with their programs, as in the BCIT and BC Hydro partnership.

AEF, building on its Retrofit Accelerator and ENBIX, is positioned to lead this coordination, with SAIT, utilities, BOMA, and CREDA as key partners.

3b. Connect Alberta's DER Ecosystem with National Expertise

Alberta can benefit from the expertise and experience of organizations working to advance DERs and building performance across Canada. Alberta Ecotrust is already a member of the Retrofit Accelerator Network (RAN), which connects recipients of Natural Resources Canada's Deep Retrofit Accelerator Initiative (DRAI) across the country. SAIT, AEF, and other Alberta ecosystem organizations can continue to deepen these connections and extend them to national organizations such as Efficiency Canada.

Connecting with those national training providers, CaGBC and CIET, that offer programming available to Albertans could provide opportunities for partnership. This could involve exploration of co-branding or credit-recognition arrangements and identify where Alberta-specific context can add value to national curricula.

Next Steps *Strengthen ecosystem coordination for DER market growth*

To begin advancing these recommendations, the following near-term actions are suggested:

- Identify areas of partnership with Alberta utilities, construction associations, and post-secondary institutions (SAIT, NAIT, NorQuest, Lakeland College, Red Deer Polytechnic) interested in co-funding or supporting workforce training.
- Explore opportunities to strengthen connections among existing networks and market actors to improve access to incentives, training, and market information.
- Build on data and insights gathered through DRAI activity in Alberta to further understand Alberta's DER market and inform future market support.
- Use existing industry relationships to coordinate advocacy around barriers and opportunities for commercial DER market growth.

Actors: SAIT, AEF (including ENBIX), utilities, Efficiency Canada, and other partners

CONCLUSION

The findings in this report point to various interconnected gaps identified in Alberta's market regarding commercial DERs. Alberta has mechanisms that support energy efficiency and retrofit activity, especially with market-building efforts such as the Alberta Ecotrust Retrofit Accelerator and ENBIX leading the advancement of the sector. However, these efforts operate within a broader environment where **market demand signals, sustained investment mechanisms, workforce development, and coordination across actors are less developed than in leading jurisdictions.** The overall challenge is not simply to add more incentive or financing programs and training opportunities, but to strengthen what currently exists and the conditions that allow these efforts to reinforce one another and support a stronger DER market.

The Demand Signal Challenge

One of the most significant differences between Alberta and the jurisdictions examined in this report is the absence of a comparable utility DSM framework. In BC, Ontario, and Nova Scotia, established utility or provincial mechanisms provide ongoing channels for investment in energy efficiency and building retrofits, alongside broader provincial climate and energy policies. These structures help create more durable market signals than individual programs alone.

Alberta's existing incentive landscape is more fragmented. Commercial support is available through municipal and other programs, while initiatives such as the Retrofit Accelerator are helping address market capacity and coordination. However, the province lacks a comparable mechanism that consistently connects utility investment, energy savings, technical support, and incentives at scale. **This distinction matters for workforce development: training supply is more likely to be sustained when practitioners can see a durable market for the skills being developed.**

What the Gaps Mean Collectively

Collectively, these findings suggest that Alberta's challenge for commercial DERs is less about the lack of individual initiatives than about how those initiatives connect and the conditions in which they operate. Incentives and financing mechanisms bolster demand, but their impact is limited when financing is a challenge to access, program information is limited and support is fragmented. Building industry capacity through training and skills development is important, but without greater certainty in the market, demand for DER expertise will remain uncertain.

In the case of BC, Ontario, and Nova Scotia, it's notable that durable policy and utility frameworks, complementary financial and technical support, and coordination among market actors can reinforce one another. Alberta does not need to replicate any one jurisdiction's model, but a comparison highlights mechanisms that could complement and strengthen the market-development work already underway in the province.

This highlights the importance of initiatives led by SAIT and the Alberta Ecotrust Foundation (AEF). The findings offer an evidence base for continuing and strengthening

existing market-development efforts, identifying opportunities for collaboration, and informing ongoing work to advocate and connect with government, utilities, post-secondary institutions, industry, and other market actors. **The findings from this work also reinforce the value of sustained investment in market-development capacity, particularly as Alberta's retrofit ecosystem continues to develop.** The recommendations within this report are intended as potential entry points into those conversations rather than a single prescribed pathway.

APPENDICES

Appendix I. Phase I Search Terms

Location-Based Terms			
Alberta	Calgary	Edmonton	Fort McMurray
Grande Prairie	Lethbridge	Northern Alberta	Prairie Provinces
Red Deer	Southern Alberta	Western Canada	
Topic-Based Terms			
ASHRAE	Building Energy	Building Envelope	Carbon Neutral
Code Compliance	Deep Retrofit	Electrification	Emissions
Energy Code	Energy Efficiency	Energy Modelling	Energy Reduction
Energy Upgrades	Energy Use Intensity	Fossil Fuel	Green Energy
Heat Pump	Integrated Design	National Building Code	National Energy Code
Step Code	Thermal Energy	Zero-Carbon	Zero-Emissions
Training-Based Terms			
Accreditation	Accredited	Apprenticeship	APEGA
ASHRAE	Bachelor	BOMA	CaGBC
Certification	Certified	Construction Association	Course
Credential	Degree	Event	Gold Seal
Journeyman	LEED	License	Masters
Module	Professional Development	Program	Seminar
Training			
Incentive-Based Terms			
Allowance Program	Credit Program	Discount	Financial Aid
Fiscal Incentive	Funding	Grant	Incentive
Performance Bonus	Rebate	Subsidy	Tax Benefit/Credit

Appendix II. Phase I Inclusion and Exclusion Criteria

Inclusion and exclusion criteria are predefined rules that outline the specific characteristics a source must have to be included in or excluded from the final databases. These criteria help ensure the review remains focused on addressing the research questions, systematically identifying the most relevant findings. Clearly defining these criteria reduces bias, ensures consistency, and enhances the validity and reliability of the review.

Criteria for TSD Programs

For an identified source to be included as an entry in the final TSD program database, the source **must satisfy all** of the following criteria:

- Program is based or available in Alberta.

  Note: Exceptions can be made for programs run by national or international groups and/or associations that are available to professionals in Alberta.
- Explicit reference to deep energy retrofits, whole-building energy efficiency upgrades, or equivalent practices (e.g., net-zero energy upgrades) aimed at achieving significant reductions in energy consumption (e.g., >50%), in the description, curriculum, or objectives.
- Available in Canada's official languages (English or French).

If an identified source meets **any** of the following criteria, it must not be included in the final TSD program database:

- Internal or proprietary corporate training programs.
- Program was not in operation between 2014 and present.

Criteria for Market Incentives

For an identified source to be included as an entry in the final market incentive database, the source **must satisfy all** of the following criteria:

- Incentive is available in Alberta.

  Note: Exceptions can be made for incentives run by national or international groups and/or associations that are available to individuals in Alberta.
- Provides support for commercial buildings (e.g., office spaces, retail, institutional buildings).
- Represents the implementation of financial or regulatory mechanisms designed to encourage deep energy retrofits (e.g., grants, rebates, subsidies, or tax incentives).

If an identified source meets **any** of the following criteria, it must not be included in the final market incentive database:

- Incentive was not available between 2014 and present.
- Represents a non-financial mechanism for encouraging deep energy retrofits (e.g., disincentives, rights-based incentives) or a non-applicable financial incentive (e.g., carbon pricing).

Appendix III. Typology of Commercial Buildings

Deep energy retrofits can be applied to many buildings, each with their own unique challenges and opportunities. The typology of commercial buildings to consider for DERs includes:

Commercial Buildings - Office buildings, public buildings, institutions.

Commercial buildings are office buildings, public buildings, and institutional buildings, which are designed primarily for use as workplaces for businesses. They come in a variety of sizes, they can be small multi-story units or tall skyscrapers and typically have office spaces, conference rooms, common spaces, and kitchens. The majority of the commercial buildings in Alberta were built prior to the 1990s. These buildings often have older building systems which are ripe for retrofitting. Later buildings may have building controls and building management systems. Some types of commercial buildings may be converted to multifamily residential buildings or hotels, provided they have the right floorplate (not too deep from exterior windows), and the right floor-to-floor heights to accommodate ventilation and plumbing requirements.

Multifamily Buildings - Condominiums, Apartment buildings, townhouses.

Multifamily buildings are residential structures, condominiums, townhouses, and apartments that house multiple separate households. They are designed with living spaces and common spaces and for larger developments, have a shared HVAC system. They come in a variety of sizes; they can be small with just a handful of units or a large complex with many buildings and units. Most living spaces have walls shared with another living space, meaning neighbours could potentially impact each other. There are also potential issues with how energy is paid for.

Recreational Buildings - Swimming pools, ice areas, fieldhouses, community centres.

A recreational building, such as swimming pools, ice areas, fieldhouses, and community centres are built for leisure activities. They often have specialized spaces that have high energy consumption (e.g., lighting on a sports field or ball court or heating for a natatorium). They often have large open floor plans and operate for extended hours, which contributes to the high energy demand. A deep energy retrofit in a recreational facility will require some out-of-the-box thinking and tailored solutions as they often have a variety of uses and specialized equipment.

Industrial Buildings - Warehouses, manufacturing facilities.

An industrial building, such as a warehouse or manufacturing facility, usually has large open spaces with high ceilings and may contain specialized equipment. Depending on the use, the HVAC system may be complex in order to support the building operations, or fairly basic, using rooftop units (RTUs) or basic ceiling mounted furnaces. These buildings are often energy-intensive, due to the work and activities within (process loads). They also typically have minimal insulation and membranes, as many are “pre-engineered structures” or use quick and dirty construction methods such as tilt-up concrete or structural insulated panels (SIPs).

Appendix IV. A Short History of Deep Energy Retrofits

Architecture 2030, founded by Ed Mazria, developed and then issued the 2030 Challenge in **January of 2006.** Architecture 2030's mission is to *rapidly transform the built environment from being the major emitter of greenhouse gases to a central solution to the climate crisis.*

2006 Architecture 2030 launched by Ed Mazria
https://www.architecture2030.org/accelerating-the-2030-challenge-to-2021/
2008 *Toronto Tower Renewal PILOT launched*
2009 *LEED Existing Buildings certification launched*
2010 *September- Royal Architectural Institute of Canada (RAIC) Committee seeks submissions that are decarbonizing (meeting 2030 Challenge): https://www.architecture2030.org/1088462342/*
2010 *First Canadian Place (Toronto) begins retrofit- due to failing exterior stone cladding*
2011 *Empire State Building retrofit*
2011 *Avenue on Portage, Winnipeg (office to residential retrofit)*
2011 *June RAIC features 2030 Challenge projects: https://www.architecture2030.org/7024024930/*
2012 *Servus Credit Union -completed a Deep Energy Retrofit in Edmonton, Alberta*
2013 *Willis Tower Retrofit (formerly Sears Tower, Chicago)*
2014 *June: Roadmap to Zero published by Architecture 2030 & submitted to the* United Nations Framework Convention on Climate Change (UNFCCC) 2015 agreement
https://unfccc.int/resource/docs/2014/smsn/ngo/418.pdf
2014 *August: International Union of Architects adopted the* ***2050 Imperative****: https://www.architecture2030.org/wp-content/uploads/2018/12/uia_declaration_081414-1.pdf*
2014 *Five Manhattan West Retrofit - by REX for Brookfield*
2014 *July - First issue of Reimagine Magazine launched by Manasc Isaac Architects https://www.flipsnack.com/99877CFF8D6/reimagine-magazine-issue-1-summer-2014/full-view.html*
2015 *Toronto Tower Renewal HI-RIS Financing (low interest loan) program*
2015 *Halifax Seaport Market / Pier 21 Retrofit*
2016 *National Arts Centre Retrofit launched, Ottawa.*
2017 *MacKimmie Tower, University of Calgary Deep Energy Retrofit (with double skin)*
2018 *CaGBC releases Roadmap for Retrofits in Canada: https://www.cagbc.org/news-resources/research-and-reports/a-roadmap-for-retrofits-in-canada-ii/*
2019 *June: AIA Urgent & Sustained Action on Climate Change: https://www.architecture2030.org/aia-climate-action-urgent-sustained/*
2024 *Alberta Ecotrust launches the Retrofit Accelerator program.*
2025 *May World Green Building Council: determining* Near-Zero Emission and Resilient Buildings (NZERBs): https://worldgbc.org/article/help-shape-the-future-of-nzerbs/
2025 *UN Report on Changing Building Codes: https://globalabc.org/sites/default/files/2025-03/Global-Status-Report-2024_2025.pdf*

Appendix V. Jurisdictional Scan Findings (Summarized Version)

This section summarizes findings from the jurisdictional scan of British Columbia, Ontario, and Nova Scotia, selected as relevant Canadian examples of commercial energy efficiency, DERs, and workforce development. While their policy and regulatory contexts differ, all three have a broader policy context that supports sustained investment in energy efficiency and building decarbonization. These findings provide useful comparators for assessing Alberta's gaps and opportunities.

British Columbia

BC leads Canada in energy efficiency, ranking first nationally in Efficiency Canada's 2024 Canadian Energy Efficiency Scorecard[55]. Provincial climate and building policies (e.g., Clean Energy Act, Energy Efficiency Act, CleanBC Roadmap to 2030), combined with an established utility demand-side management framework, have created a strong foundation for investment in energy efficiency and building decarbonization. BC Hydro's Commercial Energy Manager Program provides up to 75% salary coverage (to a maximum of $90,000/year) for on-site energy managers. FortisBC's Deep Energy Retrofit Pilot targets reductions of 50% or more in natural gas use and is explicitly designed for whole-building commercial DERs. BCIT provides micro-credential programs co-funded by BC Hydro to ensure workforce supply meets the demand that utility programs create. Zero Emissions Building Exchange (ZEBx) and Zero Emissions Innovation Centre (ZEIC) provide market transformation infrastructure and is notably the model that influenced ENBIX in Alberta.

Ontario

Ontario's provincial energy and climate policy framework, together with its electricity-sector regulatory structure, has supported a large-scale energy efficiency market through the IESO's Save on Energy portfolio. Over a four-year period from 2019 to 2023, IESO dedicated at least $420.5 million, approximately 74% of its total 4-year budget, to programming relevant for commercial, industrial, and institutional customers. Ontario also benefits from municipal and non-profit complementarity: the City of Toronto's Energy Retrofit Loan (ERL) program and The Atmospheric Fund (TAF) Energy Savings Performance Agreement model both address the upfront capital barrier. Provincially mandated energy benchmarking (e.g., Energy and Water Reporting and Benchmarking (EWRB) regulation) for large buildings creates a data infrastructure for targeting retrofits and verifying savings.

Nova Scotia

Nova Scotia's climate and energy policies, alongside its established electricity efficiency framework (e.g., Environmental Goals and Climate Change Reduction Act, Efficiency Nova Scotia), have supported a coordinated approach to building efficiency and decarbonization. Efficiency Nova Scotia's Custom Energy Retrofit Program offers performance-based incentives of approximately $0.15/kWh saved for large commercial, institutional, and industrial buildings. ReCover's Building Transformation Program

[55] Efficiency Canada. 2024 Canadian Energy Efficiency Scorecard: Provinces and Territories. Carleton University, November 2024. https://scorecard.efficiencycanada.org/wp-content/uploads/2024/12/2024-Scorecard-Report.pdf

provides navigational and technical support to building owners. Together, this mix of initiatives demonstrates how performance-based incentives and capacity-building support can be combined within a smaller region's retrofit market.

Exhibit 1 — DER-Related Investment Comparison: BC and ON

The table below summarizes DSM and commercial energy efficiency investment across BC and Ontario, using annual utility reports and publicly available program data.

Province	Utility / Body	Fiscal Period	Total Investment (M)	Commercial & Industrial (M)
BC	BC Hydro	2024	$73	$37
BC	FortisBC	2024	$159	$21
ON	IESO	2019-2023	$568	$421

Exhibit 2 — Incentives Comparative Gaps Matrix

The following matrix summarizes key gaps in Alberta's incentive landscape alongside relevant features identified in BC, ON, and NS across these gap areas. The comparison illustrates where Alberta's current approach differs from those used in other jurisdictions and where there may be opportunities to strengthen support for commercial DERs.

Alberta — Current State	Gap Area	Leading Jurisdictions
CEIP and municipal programs provide some support for commercial DERs, but coverage remains fragmented, limited in scale, and concentrated in a few municipalities.	 Dedicated DER Programs	**BC:** Provincial CleanBC Custom Programs, FortisBC's various rebates & DER pilot initiatives **ON:** IESO Retrofit Program, Enbridge Commercial Custom Retrofit Program
Currently, only 36% of incentives in AB available to commercial buildings, with a downward trend since 2014.	 Commercial Building Eligibility	BC/ON utility DSM portfolios explicitly target commercial & industrial, with BC utilities dedicating up to 50% to C&I customers and IESO up to 74% of their 4-year framework budget.
85% of funds rely on post-project distribution. CEIP provides a loan option, but the interest rates (5.66% - 5.75%) may limit uptake.	 Funding Mechanisms	ON: Models like the TAF ESPA provide upfront capital, with costs recovered from verified savings.
34% lack public max award values and ~60% do not disclose fund distribution details, creating uncertainty for applicants assessing project feasibility and available support.	 Program Transparency	Regions with utility DSM frameworks offer greater transparency through public reporting on spending and performance. Programs, like CleanBC, also provide detailed information
Alberta has no comparable utility DSM requirement or framework, limiting sustained utility investment in commercial efficiency and DERs.	 DSM Investment Scale	Other regions (BC, ON, NS) have established DSM frameworks to provide an ongoing mechanism for utility-supported investment in energy efficiency, including commercial programs.
AB has energy management and DER capacity building supports but lacks models that .embed technical support directly into the delivery of energy savings and incentives.	 Technical Assistance	BC and ON utility programming offer subsidized energy manager support and support the identification and implementation of energy saving measures.

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