Final Report

Financing Solutions for High-Efficiency New Homes

Prepared for:
Alberta Energy Efficiency Alliance

August 2024

dunsky
Energy + Climate

About the Authors

Dunsky Energy + Climate Advisors supports leading governments, utilities, corporations and others across North America in their efforts to accelerate the clean energy transition, effectively and responsibly.

With deep expertise across the Buildings, Mobility, Industry and Energy sectors, we support our clients in two ways: through rigorous Analysis (of technical, economic and market opportunities) and by designing or assessing Strategies (plans, programs and policies) to achieve success.

Dunsky is proudly Canadian, with offices and staff in Montreal, Toronto, Vancouver, Ottawa and Halifax. Visit **www.dunsky.com** for more information.

The **Alberta Energy Efficiency Alliance** (AEEA) is a member-based organization with a diverse group of stakeholders actively working to maximize energy efficiency in the province of Alberta. Energy efficiency plays an important role in creating a sustainable Alberta, economically and environmentally.

Since 2007, the AEEA has brought people together to collaboratively solve problems, coordinate action and be a common voice, by delivering speaking engagements, and sharing resources and ideas. The goal of AEEA is to reduce the barriers to the adoption of energy efficiency technology and activities, recognizing that there is a need for all orders of government, businesses, non-profit organizations and individuals to actualize the benefits of energy efficiency.

Visit **www.aeea.ca** for more information.

Key Findings

This study aims to address financial barriers hindering homeowners from purchasing high-efficiency new homes (with a focus on single-family homes to start) by exploring various financing options. It also seeks to build awareness and interest in potential financing offerings through stakeholder engagement. The overall goal is to reduce greenhouse gas emissions and energy use from new homes.

Based on our **in-depth analysis and engagements** with a range of Alberta stakeholders, the following insights emerged:

1. **Market Opportunity for High-Efficiency New Homes**: Alberta, with over 20,000 new single-family housing starts (and nearly as many multi-family units) annually, is among the fastest-growing provinces. Increasing the energy performance of just single-family new homes can prevent up to 42 million tonnes of GHG emissions by 2050. Additional benefits include greater comfort, improved air quality, and lower energy costs.
2. **Higher Upfront Costs**: Building high-efficiency homes adds 1% to 13% to the cost of a new detached home, translating to an additional $5,000 to $50,000 depending on the energy measures. Financing options can help homeowners manage these costs over 20-30 years, enhancing access to the financial benefits of high efficiency homes.
3. **Preferred Financing Options - Green Mortgages and PACE**: Both options offer favourable loan terms and scalability. PACE can leverage the existing Clean Energy Improvement Program infrastructure, while Green Mortgages benefit from the mortgage industry's existing market presence. Personal loans are less effective due to higher lender risk and less favourable terms.
4. **Challenges with Financing Options**: Eligibility for Green Mortgages and PACE is limited to homeowners without mortgage insurance. Lenders are concerned about PACE's priority lien status, and municipalities worry about administrative strain from expanding CEIP to new homes. Addressing these challenges requires data, education, and policy changes.
5. **Stakeholder Interest**: Stakeholders, including homebuilders, lenders, and municipalities, are engaged and supportive of exploring financing solutions. They emphasize the need for a broader effort, including homeowner education, workforce development, incentives, and policy changes.

Stakeholder Perspectives on Financing Options

Financing is an important tool

- Can help address the cost barriers to purchasing a high-efficiency home
- Plays an important role in building market demand and industry capacity

Simplicity and accessibility are key

- Programs should be easy to navigate (for homeowners and builders)
- Eligibility criteria and costs should not exclude first-time buyers and renters

Government has a role to play

- Loan guarantees, loan loss reserve or other credit enhancements can help to reduce lending risk and support government priorities

Key challenges remain

- These include administrative capacity, lack of data and information, and a need for training and capacity building for industry (including real estate/appraisal sectors)

We spoke to representatives from:

- **6** Alberta homebuilders and associations
- **12** municipalities (plus CEIP Administrator)
- **5** financial institutions (including CMHC)

Potential Paths Forward

Based on our assessment of three financing options—Property Assessed Clean Energy (PACE), Green Mortgages, and Green Personal Loans—we provide the following **considerations and potential paths forward** in Alberta:

TO ADVANCE PACE FINANCING

1. Gain buy-in from mortgage lenders and insurers:

- Relax CMHC mortgage insurance restrictions
- Establish loan loss reserve
- Engage mortgage industry around energy cost savings

2. Clarify CEIP-enabling legislation:

- Obtain legal opinion on new-home program
- Modify provincial legislation (if needed)

3. Explore partnerships with private lenders:

- Leverage administrative efficiencies
- Ensure legislation permits private partnerships

TO ADVANCE GREEN MORTGAGES

1. Extend mortgage amortizations for energy-efficient homes:

- Allow up to 35-year amortizations
- Policy changes to increase eligibility for insured homes

2. Value energy savings:

- Incorporate energy savings into mortgage valuation processes.

3. Support the development of a secondary market for green home mortgages:

- Develop green mortgage bond market
- Create consistent green bond framework

GENERAL DESIGN PRINCIPLES

1. Prioritize **consistency and simplicity** in program design
2. Offer a **streamlined process** for application and approvals to improve convenience
3. Improve **access to financing** for all homeowners
4. Deliver **clear and compelling messaging** to a broad range of audiences
5. Build strong **relationships with home builders and financial institutions**

Main Report

Table of Contents

1. Introduction

1.1 Context
1.2 Study Objectives
1.3 Study Approach

1.1 Alberta Context – Support Level and Policy Gaps

There is widespread support for reducing emissions from housing ....

- All levels of government are targeting **Net Zero by 2050**
- Most Albertans **support high-efficiency homes**
- **The industry is taking action**, with a growing number of home builders certifying net-zero / high-efficiency homes in AB and nationally, and financial institutions are offering efficiency-focused products to customers.

... but there is much work to be done.

- **Provincial building codes** currently at Tier 1 of the NBC 2020
- Most incentive and financing programs target **existing home retrofits**
- **Consumer demand** for net-zero / high-efficiency homes currently limited.

1.1 Context – Barriers to High-Efficiency Homes

Overcoming Barriers to High-Efficiency New Construction

*For more details on barriers, see **Section 2**.*

- **Upfront Costs:** High-efficiency homes have higher upfront costs due to enhanced insulation and air sealing, high-performance windows, and advanced equipment like heat pumps (in some cases) and heat recovery ventilators (HRV). Although lower operating costs can offset these expenses, high upfront costs remain a barrier for buyers, especially those with high debt loads or smaller down payments.
- **Information Gaps:** Homeowners and buyers may lack knowledge about the benefits of high-performance homes and how to access incentives and programs such as CMHC's partial premium refund. Builders and lenders could also benefit from more data on costs, savings and market interest in high efficiency homes in order to inform decisions related to potentially increasing offerings tailored to higher efficiency homes.
- **Industry Capacity:** Challenges related to industry capacity for building high efficiency homes include a lack of experience for some builders and HVAC specialists, limited supply of energy advisors, supply chain delays, and inadequate valuation of high-performance homes by appraisal and real estate professionals.
- **Alberta-Specific Barriers:** The relative prices of natural gas and electricity in Alberta, along with relatively high heating requirements, creates a longer payback for high efficiency construction in the province compared with other regions.

Most Programs Target Existing Buildings

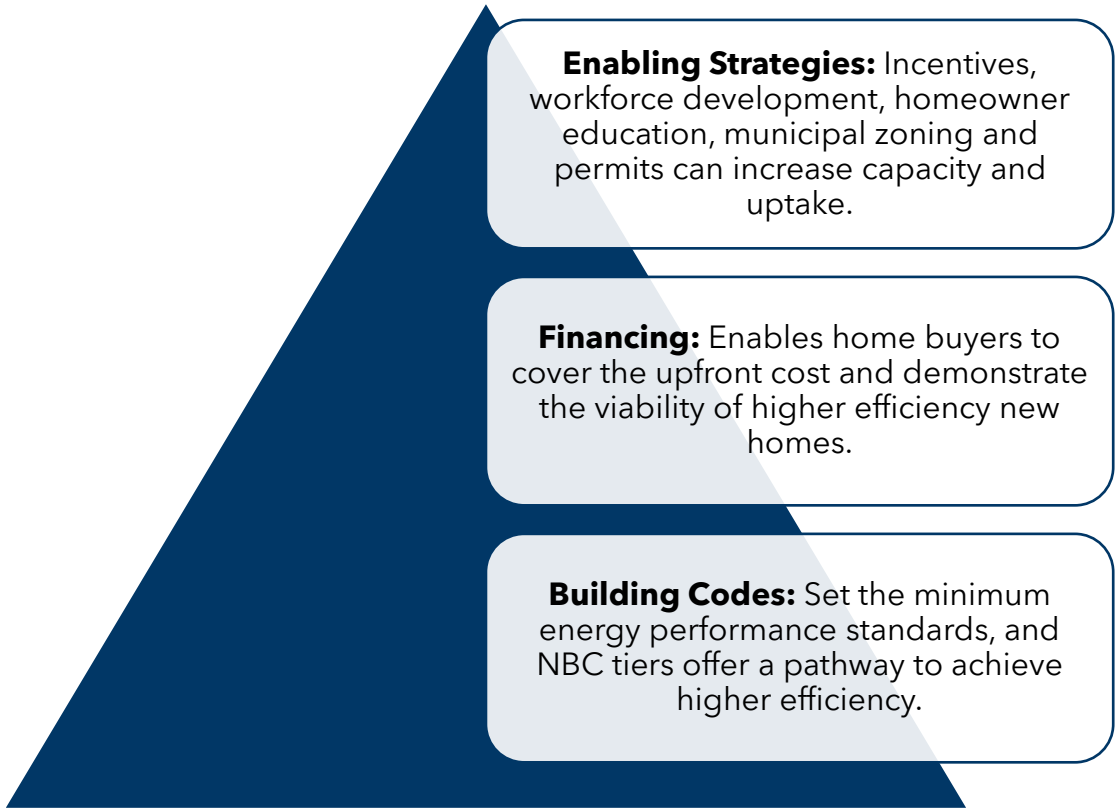
- Limited policies exist to address these barriers to high-efficiency new homes. Most federal and municipal financing and incentive programs currently target existing building retrofits (see Table 2).
- Available tools to support high-efficiency new buildings include building codes, providing transparent and standardized information to homebuyers, and capacity building within industry.

1.1 Context – The Role of Financing

Financing Has a Key Role to Play to Support Building Code Evolution

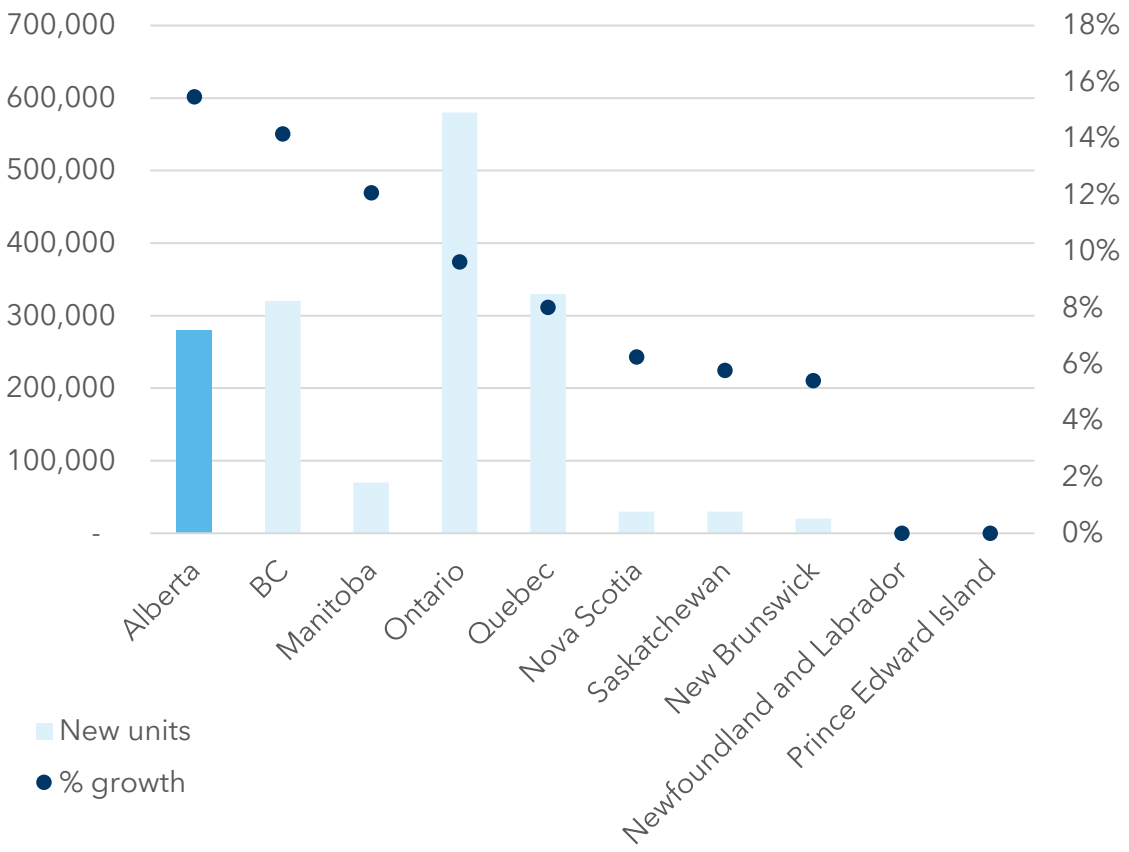
- Financing, along with other enabling tools, can support the eventual adoption of higher building code tiers in Alberta.
- By addressing the higher incremental costs of new high-performance buildings, and offering attractive interest rates and terms, financing can increase consumer demand and adoption of new houses built beyond current code.
- Financing can also build market readiness and allow industry to develop the capacity to meet higher energy performance levels across the province.
- As a voluntary tool, financing can be offered by governments and lenders to support their climate goals.

Figure 3. Building codes provide the foundation for energy performance. Financing and other voluntary tools can support adoption of higher efficiency new construction laying the groundwork for code evolutions.



1.1 Context – Growing Housing Demand

Figure 4. Housing stock and percentage growth to 2030 by province



Source: CMHC, 2023. Housing shortages in Canada | Updating how much housing we need by 2030.

Alberta is Experiencing Growing Demand for Housing and Construction

- **Record Construction:** Housing construction has increased by 40% since 2020 to record levels in 2024 - driven by population growth and higher incomes.
- **Growth Forecasts:** Canada Mortgage and Housing Corporation (CMHC) estimates that Alberta will need an additional 280,000 housing units by 2030 to meet demand (~50,000 new units per year). This is faster growth than any other province.
- **Emissions Impact:** Alberta's housing sector is responsible for 22% of Canada's housing emissions, higher than its 12% population share due primarily to its climate and the make-up of its electrical grid. As housing demand grows, the need for low-emissions housing becomes more important.

1.2 Study Objectives

STUDY OBJECTIVES

Opportunity Assessment: Explore financing options to help homeowners overcome financial barriers to purchasing high-performance new homes (with a focus on single-family homes to begin).

Awareness and Engagement: Build awareness and interest in developing a new home financing offering through stakeholder engagement.

OVERALL GOAL

Reduce GHG emissions and energy use from new homes.

TARGET AUDIENCES

Stakeholders and policymakers with an interest in improving the energy performance of new homes in Alberta (including municipalities, homebuilders, financial institutions, and provincial/federal governments)

1.3 Study Approach

1 Stakeholder Engagement

- Conducted a series of 13 interviews and group discussions from January to May 2024.
- Engaged with 22 stakeholders from the construction sector, financial institutions, municipalities, and government agencies.
- Aimed to gather information, test assumptions, share insights and analysis, and build awareness and interest.
- Conducted background research to review existing studies, identify financing options, develop evaluation criteria, and identify best practices from other jurisdictions.

2 Archetype Analysis

- Modelled incremental costs, energy, and GHG savings for new homes built to higher tiers of the 2020 NBC.
- Focused on incremental costs and savings of Tiers 3 to 5 relative to Tier 1 (adopted by Alberta in 2024).

3 Process & Outcomes

- Shared draft results, including archetype analysis and engagement takeaways, with key stakeholders during a virtual workshop in June 2024.
- Developed a final report and set of recommendations for next steps based on workshop feedback.

2. Defining the Opportunity

2.1 Assessment of Market Potential and Impacts

2.2 Homeowner Motivations and Barriers

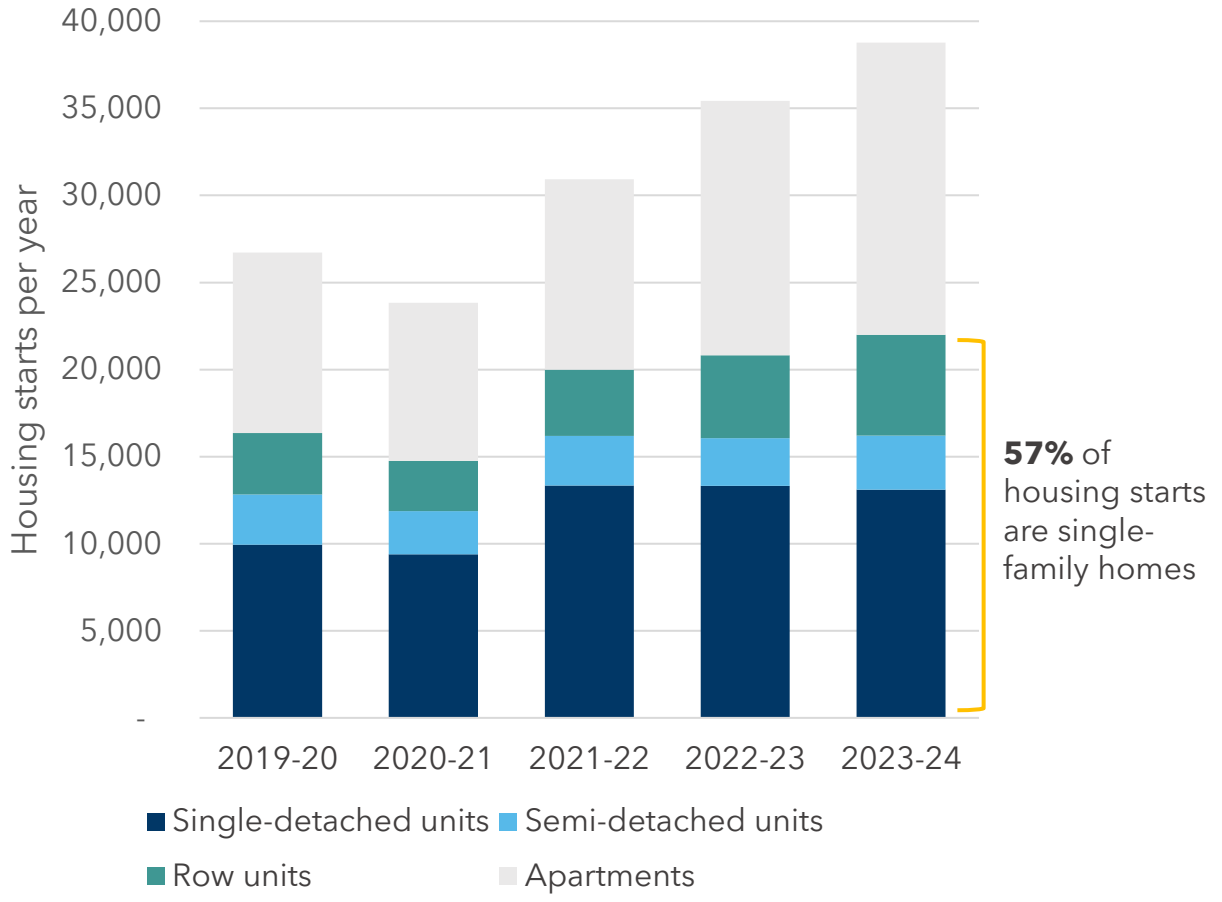
2.1 Assessing the Size of the Market

In recent years in Alberta, approximately **21,000 new single-family housing projects are started annually**. Leveraging energy efficiency measures during the initial construction phase presents an optimal opportunity, as most components of the envelope of a newly constructed home will likely not be retrofitted in the next 25 years. Tapping into this potential enhances energy savings for homeowners and yields long-term reductions in greenhouse gas emissions.

With the appropriate tools, these initiatives translate into **tangible financial advantages** for homeowners, ultimately diminishing overall housing expenses.

Note that while the **scope of this study focuses on single family homes–which account for most housing starts–**data shows that apartment construction has grown since the beginning of the decade, now representing 43% of starts, up from 39% in 2019. Therefore, apartments and other building types (such as commercial buildings) are an important area of further investigation.

Figure 5. Alberta housing starts, 2019 to 2024



Source: CMHC, Table: 34-10-0143-01 (formerly CANSIM 027-0001)

2.1 Costs of Building to Higher Energy Efficiency Levels

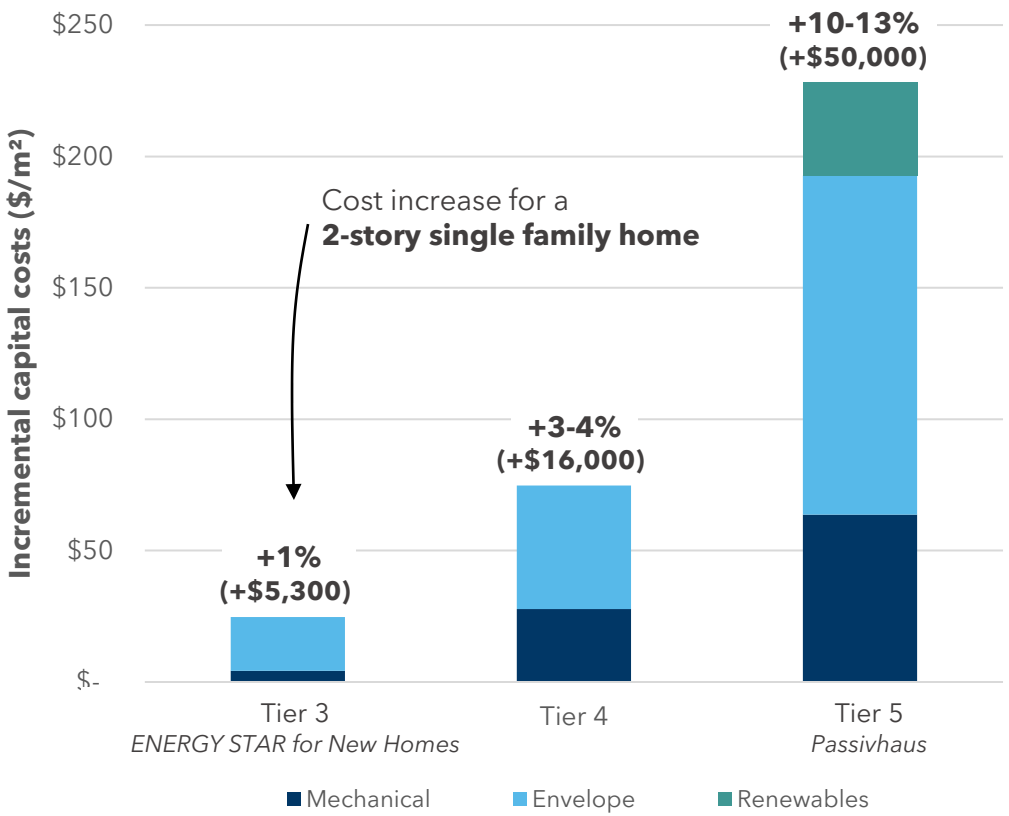
Building high-efficiency homes entails higher upfront costs. We modelled these incremental capital costs (ICCs) for meeting National Building Code Tiers 3 to 5 for a 2-storey single-detached home, relative to Alberta's current standard (Tier 1). For more information see Appendix B.

Tier 3 entails a modest ICC of $5,300 (1% of total costs). This requires moderate envelope upgrades that target windows and airtightness as well as using an efficient HRV.

Tier 4 in this analysis included additional envelope improvements and the addition of an air-source heat pump with natural gas backup, resulting in an ICC of $16,000 (3-4% of costs).

Tier 5 requires the most stringent upgrades—including envelope, cold-climate ASHP with electrical backup, drain water heat recovery, electric storage water heater and on-site solar PV generation. This results in an ICC of $50,000 (10-13% of costs). Envelope upgrades represent the largest portion of these costs.

Figure 6. Incremental capital costs of meeting NBC Tiers 3 to 5*



* Similarly, a recent report noted the incremental costs associated with meeting Tier 3, 4 and 5 of the NBC, ranging from 1.05% (Tier 3) to 25% (Tier 5). *[Tiered Energy Code Roadmap, Summary, BILD Alberta, Aug. 2022]*

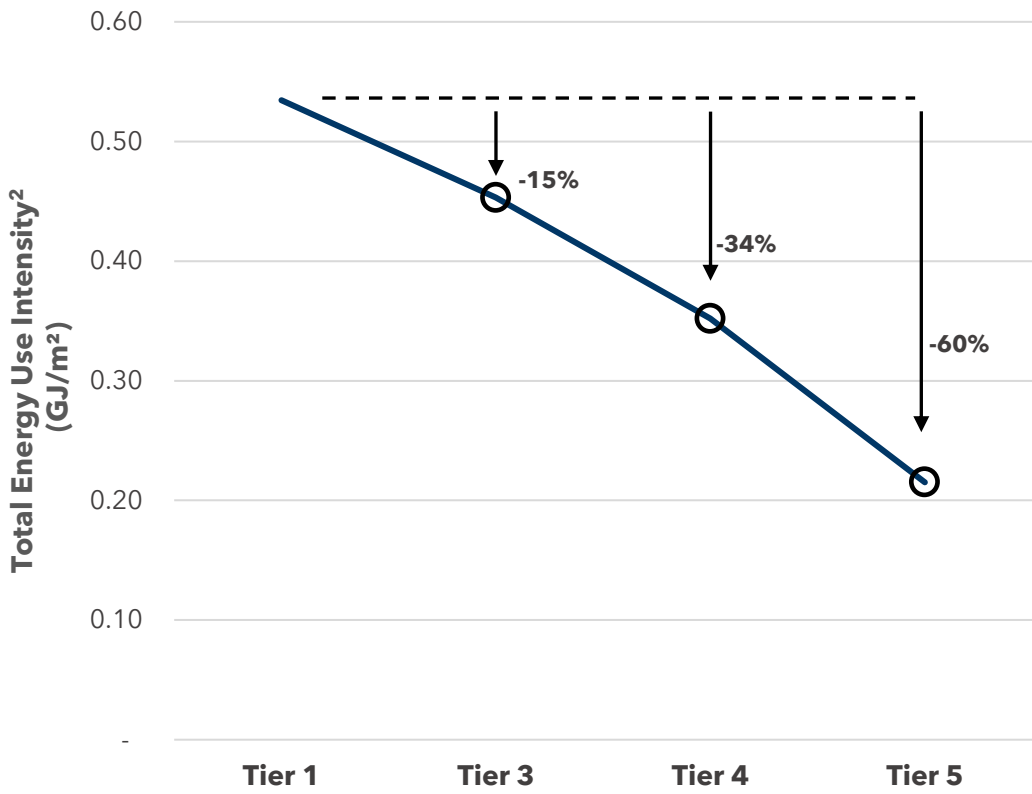
2.1 Energy Savings Potential

Reaching higher NBC 2020 Tiers requires reducing the building's annual energy consumption of service water heating and space-conditioning as well as its gross heating load, to reach the targets outlined under NBC 2020.

To understand the impact to the homeowner, Figure 7 on the right shows how the **total energy use intensity** evolves at different Tiers, for a single-family home in Edmonton. This includes **service water heating** and **space-conditioning** as well as all other end-uses such as **lighting** and **appliances**. The presented energy use is what a homeowner should expect from a house reaching the higher NBC 2020 Tiers.

Since the upgrades to reach higher Tiers specifically target service water heating and space-conditioning, a significant portion of remaining consumption at Tier 5 is comprised of harder-to-abate end-uses, such as lighting and appliances.

Figure 7. Impact of NBC 2020 Tiers on Total Energy Use Intensity



Note: Figure includes energy use of all building end uses.

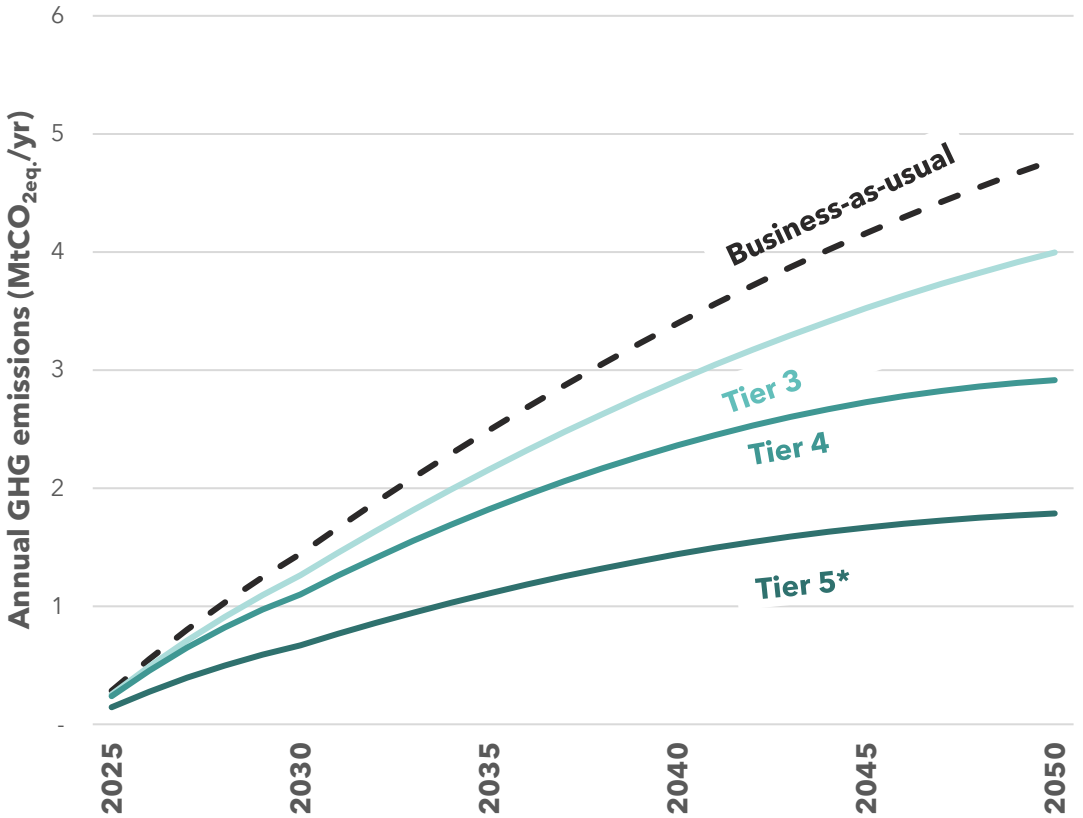
2.1 Greenhouse Gas Savings Potential

Greenhouse gas (GHG) emissions reduce incrementally as higher Tiers are reached. From a province-wide decarbonization perspective, increasing the energy efficiency of the new building stock will yield significant emissions reductions.

Figure 8 shows the annual GHG emissions from Alberta's new buildings stock, based on Tier compliance. Without going above Tier 1 code requirements (business-as-usual), the emissions from all buildings constructed from 2025 until 2050 would represent about **5 million tonnes of carbon dioxide equivalent ($MtCO_2e$) of annual emissions in 2050**.

Alternatively, if all new single-family houses in Alberta were built to Tier 3, the **total (cumulative) emissions between 2025 and 2050 would be 7 $MtCO_2e$ lower** than business-as-usual. Building to the highest Tier (5) would result in emission reductions of **42 $MtCO_2e$** (cumulative over 25 years).

Figure 8. Cumulative annual GHG emissions from new single-family homes (2025-2050) in Alberta, based on adoption of NBC 2020 energy performance tiers



* Despite aiming to achieve net-zero ready construction, new Tier 5 homes would still contribute new GHG emissions, due to the carbon intensity of Alberta's electricity supply. Emissions factors are provided in the appendix.

2.2 Homeowner and Societal Motivations

Financial benefits	• **Lower monthly energy bills** from energy efficiency upgrades and/or solar PV generation can offset higher upfront installation costs within several years for Tier 3 homes (i.e., Energy Star certified). • **Reduce exposure to price volatility** by reducing energy use and adding self-generation at a known fixed cost.
Resilience and comfort	• **Enhanced occupant comfort and better indoor air quality** as a result of superior insulation, airtightness, and active ventilation, providing more comfortable conditions year-round. • **Greater thermal resilience** (maintaining stable indoor temperatures) against storms and extreme weather events that increasingly result in power outages, relative to home designed to code.
Resale value	• **Energy performance is valued highly among homebuyers**, and likely to result in higher property prices as more widespread adoption of home energy labelling occurs. Federal Budget 2024 committed $30m to developing a national approach to home energy labelling, and some Alberta municipalities are working to advance it at the local level.
Climate and environment	• **Climate and environmental concerns** are important to Albertans, and purchasing a high-efficiency home aligns with many homeowner's values. • **Supports municipal climate and energy targets**, with residential buildings being an important sector to address.
Economic development	• **Create jobs and economic benefits** for Alberta's construction sector through increased consumer demand for value-added products, and opportunities to support workforce development to meet future code updates.

2.2 Financial Barriers to High-Efficiency Homes

Incremental upfront costs	Building a high-efficiency home can **increase costs by $5,000 to $50,000.**[1] Although energy efficiency brings down energy costs, some homeowners are not able or willing to assume the associated increase in mortgage payments. A bigger mortgage can make the difference between **needing mortgage insurance** and not, as larger mortgages naturally require larger down payments to remain exempt.[2] Homeowners that do require this insurance incur additional housing costs, with the insurance premium generally ranging between 2.8% and 4% of the mortgage amount. In addition, the amortization period for insured mortgages is currently restricted to a maximum of 25 years, which results in **higher monthly mortgage payments** than mortgages amortized over a longer period.
Access to financing	**Access to adequate financing** to cover the cost of energy efficiency measures through a home mortgage may prove challenging as many homebuyers use available mortgage space for maximizing the size and/or aesthetic upgrades to a new home. This challenge has been compounded by the introduction of **more stringent mortgage stress testing** in Canada in June 2021, which limits how much a homeowner is able to borrow. Access to financing can also be limited by the **assessed value of a property** as lenders generally require mortgages to be the lessor of the appraised value of the home and the purchase price. Potential barriers for financing high efficiency homes, therefore, exist when appraisers are not equipped to recognize the value of energy efficiency in their assessment and a financing gap occurs when the assessed value may not match construction costs.

1. The incremental cost depends on the level of efficiency, as measured relative to Tier 1 of the 2020 national model building code.
2. If a homeowner's down payment represents less than 20% of purchase price, mortgage loan insurance is required. A minimum down payment of 5% or more is nevertheless required, depending on the purchase price. Homes costing more than $1 million are not eligible for mortgage loan insurance.

2.2 Behavioural Barriers to High-Efficiency Homes

Competing Priorities	A homeowner's priorities are generally reflected in what parts of their home they are willing to spend extra on. For many, this includes size and aesthetic improvements to the basic home design offered by a given home builder. When faced with competing priorities, **energy efficiency is often not favoured**. Unclear or long return on investment (ROI) calculations can further dissuade homeowners from choosing energy efficiency measures.
Knowledge and Perceptions	For many homeowners, energy efficiency isn't a primary consideration when purchasing a home. The **benefits of energy efficiency are often unknown and undervalued**, with many technologies being unfamiliar. Misconceptions about emerging technologies like cold climate heat pumps may contribute to the perception that some energy efficiency measures are too expensive, risky, or unreliable, leading to distrust in their benefits.
Complexity	The construction of high-performance homes is expected to become more accessible over time, but the **current process remains more complex** than that of traditional homes. Contributing factors include higher construction costs, longer construction periods, potential additional fees for permitting and green building certification, and the need for greater coordination among the design and construction teams. Specialized equipment impacted by supply chain constraints can also lead to unexpected costs, particularly for less experienced companies. Furthermore, while homeowners may be eligible for certain incentives, they might be unaware or discouraged by the additional administrative burden without proper support.

2.2 Structural Barriers to High-Efficiency Homes

Limited Workforce Capacity	Existing programs (e.g., Alberta's Clean Energy Improvement Program) have reported **homeowners facing long delays** to install energy efficiency measures, in part due to the shortage of skilled and qualified construction workers in Alberta and across Canada. This is a growing challenge as many construction workers are nearing retirement and insufficient workers are joining the labour force.[1]
Increased Construction Costs	The construction industry is affected by **recent increases in material, labour and financing costs**. Supply chain constraints and limited workforce capacity have also been causing delays, which puts further upward pressure on construction costs.
Efficiency Benefits Undervalued	**Appraisers often undervalue energy efficiency improvements** because valuations are often based on direct comparison with similar homes in the neighbourhood, which tend not to have energy upgrades. Since lenders use appraisal value as one determinant of maximum lending amount, this creates a potential barrier to financing energy upgrades through a mortgage

1. There are too few new workers joining the labour force to counterbalance the number the of workers retiring. These conditions were exacerbated by the pandemic, as many workers left the construction industry by taking an early retirement or changing careers. Canada Mortgage and Housing Corporation. 2024. Housing Supply Report.

3. Financing Options

3.1 General Overview
3.2 Comparison of Options
3.3 Stakeholder Perspectives
3.4 Delivery Partner Roles

3.1 General Overview

The **three options** explored in this study are:

PACE Financing

Property Assessed Clean Energy (PACE) allows homeowners to finance the incremental costs of energy upgrades through a local improvement tax. The borrowed amount is repaid over time via a special charge on the property tax bill. Because the financing is tied to the property, not the owner, the outstanding balance can be transferred to a new owner in the event of a sale.

Green Mortgages

Green (or energy efficient) mortgages enable homeowners to integrate the incremental costs of energy upgrades into their mortgage.

Personal Loans

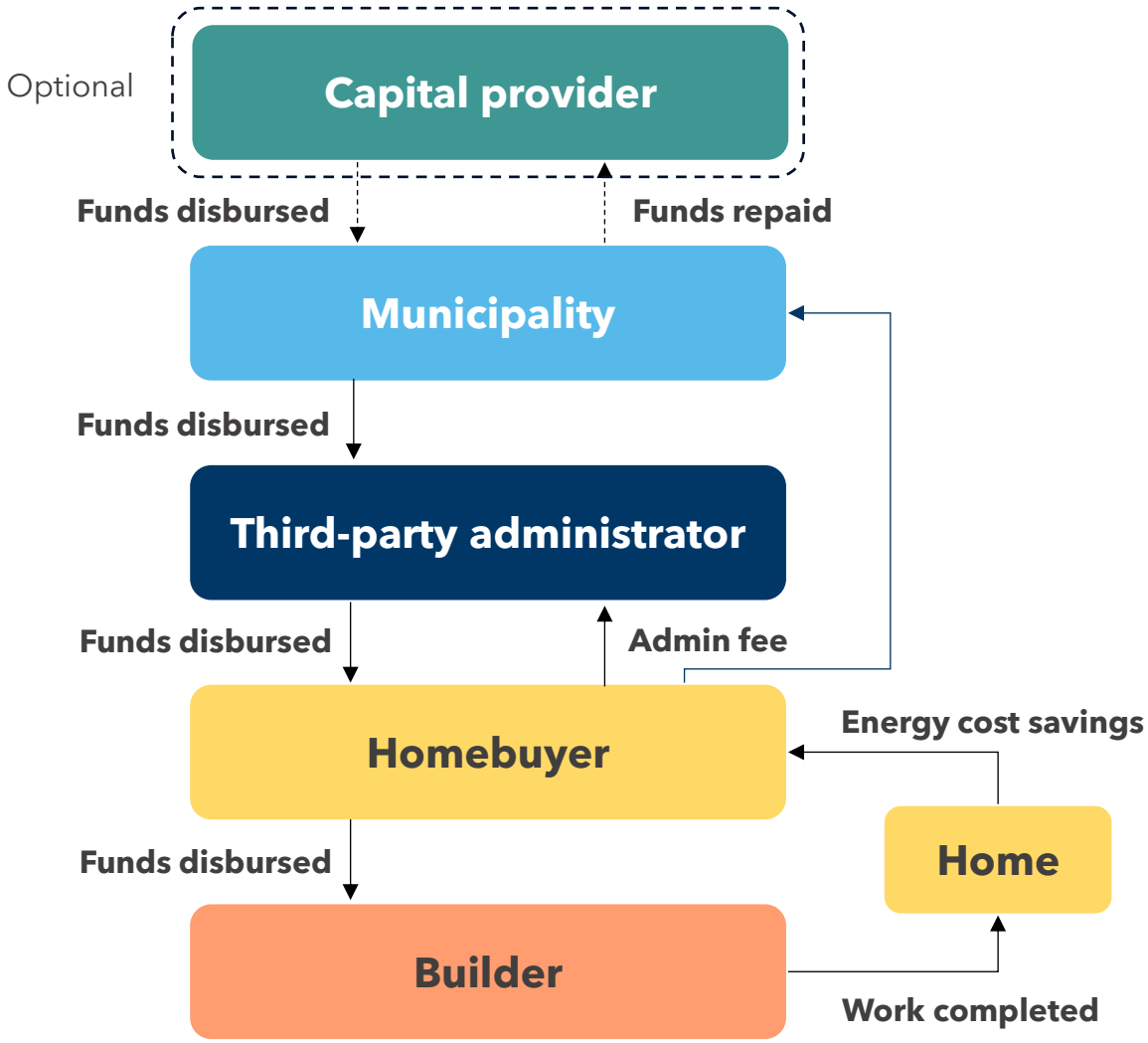
Personal loans are a simple and convenient option that allows homeowners to finance the incremental costs of energy upgrades excluded from the home mortgage through an unsecured Personal loan.

On-Bill Financing (OBF) is another potential option, allowing homeowners to conveniently finance the incremental costs of energy upgrades through their utility bill. However, it was excluded from the scope of this study as the mix of competitive and regulated energy retailers in Alberta does not make implementation of OBF as straightforward as jurisdictions with fully regulated utility markets. When it was raised during the initial stakeholder engagement for the project, stakeholder sentiment generally agreed that it would be challenging to implement given Alberta's deregulated utility market.

3.1 PACE Financing

Property Assessed Clean Energy (PACE) is an innovative financing mechanism that allows municipalities to leverage the property tax system to offer financing to homeowners for clean energy improvements. Under this model, the **property is used as collateral** and the amount borrowed is **repaid via a special charge on the property tax bill**. This allows any outstanding balance to be transferred to a future home buyer, who will inherit the repayment obligations. Some PACE programs also provide access to low-cost and long-term financing with a fixed interest rate.

Some municipalities will manage their lending risk by placing a lien on the property. This means that in the event of a default, the PACE balance in arrears (rather than full amount) would become due and payable to the municipality before other liens and lenders are able to realize recoveries on the remaining value. Once the property is sold, the new owner would then be responsible for continuing PACE payments moving forward. In this way, the non-acceleration of PACE assessments helps protect mortgage lenders by limiting the lien liability in the event of a foreclosure. Moreover, PACE does not interfere with a lender's foreclosure and other remedy rights. Some municipalities choose not to place a lien on properties with a PACE loan.



3.1 PACE Financing in Alberta

While the Province regulates energy efficiency in new construction via the building code, no comparable code currently exists for existing housing, a significant source of community emissions. As a result, many Alberta municipalities have opted to participate in the **Clean Energy Improvement Program** (CEIP).

CEIP, which uses the PACE model, is offered across the province and is administered by Alberta Municipalities, a not-for-profit municipal association. The administrator manages applications, disburses funds, and helps connect contractors with building owners. CEIP is backed by enabling legislation under the Clean Energy Improvements Regulation of the *Municipal Government Act*.[1] The legislation does not explicitly restrict new homes from accessing financing, but a formal legal opinion may be needed to provide assurance to municipalities.

Since launching in 2021, **CEIP has expanded to cover 16 Alberta municipalities** (see Table). All local CEIP programs target the existing housing stock. In Edmonton, CEIP oversees an additional stream targeting commercial buildings. Another six residential programs are planned before the end of 2024.

Participating CEIP Municipalities

- Town of Athabasca
- City of Calgary
- Town of Canmore
- City of Cold Lake
- Town of Devon
- City of Edmonton
- City of Grande Prairie
- City of Lethbridge
- Town of Okotoks
- Town of Rocky Mountain House
- City of St. Albert
- Town of Stettler
- Village of Stirling
- Strathcona County
- Sturgeon County
- Town of Westlock

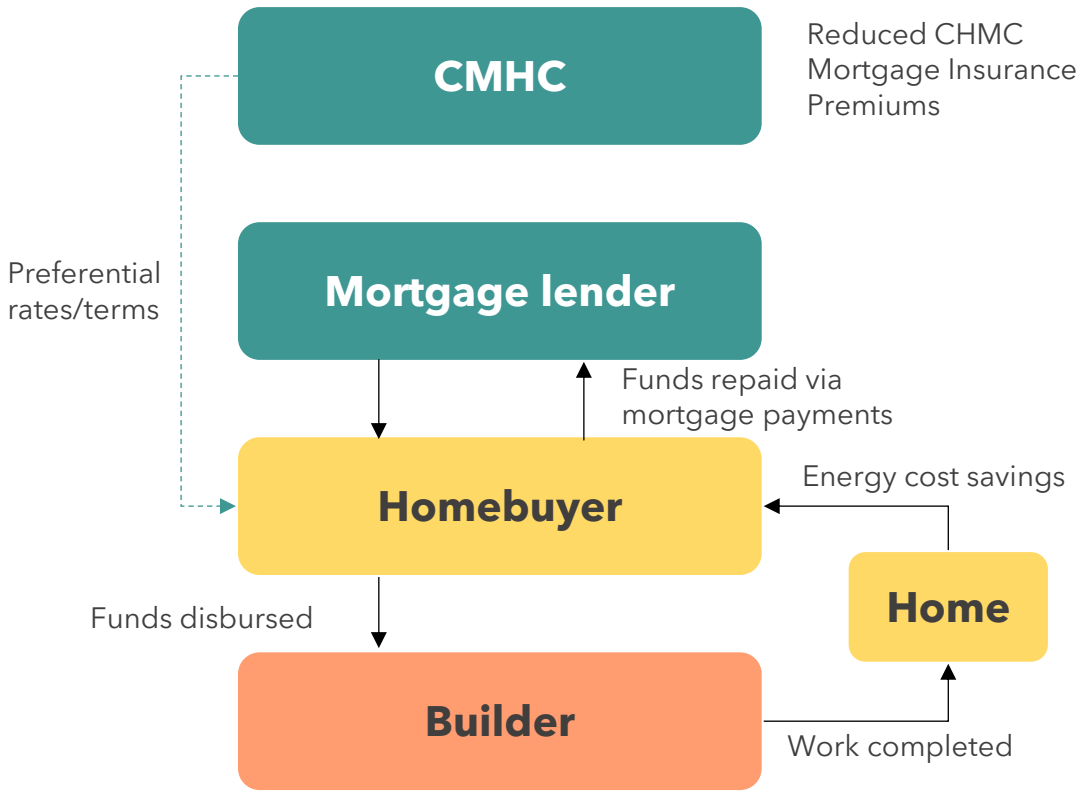
1. Municipal Government Act, Clean Energy Improvements Regulation, Alberta Regulation 212/2018. (2020).

3.2 Green Mortgage

Green or energy efficient mortgages are a financial instrument that **help homeowners purchase energy efficient homes by offering preferential loan terms** (such as lower interest rates or longer amortization periods). Several financial institutions have launched green mortgage products in Canada in recent years. Current programs include:

- Desjardins' Sustainable Home Program
- RBC's Green Home Mortgage

The Canada Mortgage and Housing Corporation (CMHC) also offers mortgage insurance premium rebates of up to 25% through its Eco Plus program, which requires insured homes to have an energy efficiency certificate or meet energy and GHG targets.[1]



1. The list of eligible certifications and GHG / energy targets can be found at https://www.cmhc-schl.gc.ca/Personals/home-buying/mortgage-loan-insurance-for-Personals/cmhc-eco-programs/cmhc-eco-plus

3.2 Green Mortgages – Existing Offerings for New Homes

	Green Home Mortgage	Sustainable Home Program
Offered by	Royal Bank of Canada	Desjardins
Favourable Terms	• 35-year amortization • Guaranteed capped interest rate for 36 months • Up to $3,000 cashback • Fast-tracked and firm approvals	• Up to $2,000 cashback
Recognized Certifications	Various	LEED® (Certified, Silver, Gold, Platinum)

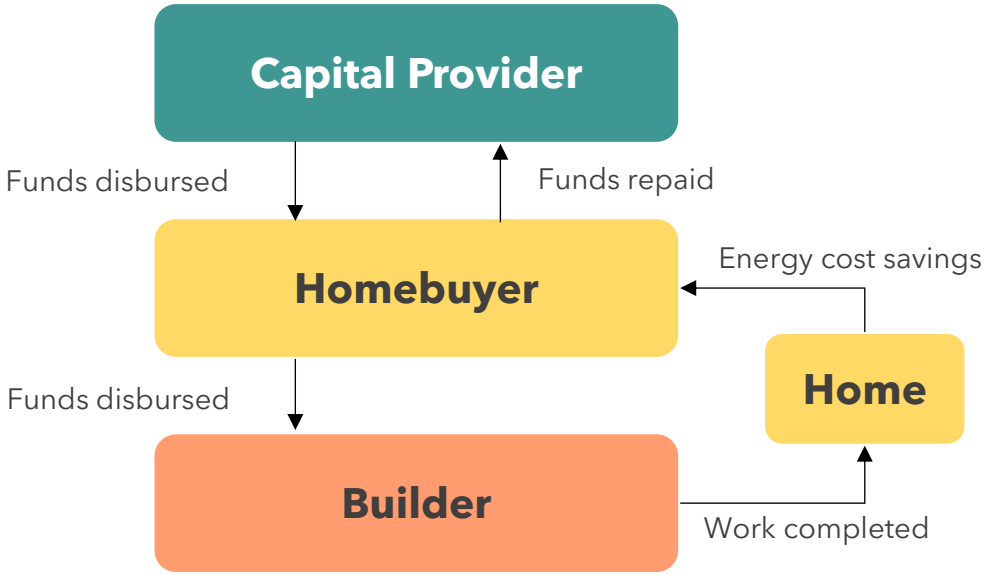
3.2 Green Personal Loans

With green personal loans, **a private lender (or government) offers homeowners an unsecured loan product for home energy upgrades**. Unlike PACE financing and green mortgage programs, the loans are not secured by collateral (i.e., property). As a result, personal loans tend to carry **higher risk for lenders**, who as a result typically offer shorter terms and higher interest rates than the other two options.

Existing green loan options include:

- RBC's Energy Saver Loan
- Scotiabank's EcoEnergy Financing
- Vancity Credit Union's Planet-Wise Home Renovation Loans
- Federal Government's Canada Greener Homes Loan

However, **these products are all for existing homes**, and it is not confirmed if these can apply to new homes.



3.2 Comparison of Options: Key Characteristics

Key Features	PACE Financing	Green Mortgage	Personal Loan
Repayment	• Levy on property tax bill • Collected by municipality	• Mortgage payments (principal + interest) • Collected by lender	• Loan payments (principal + interest) • Collected by lender
Interest rates	• Low • Ranges from 2-4% (CEIP)	• Relatively low • Ranges from 5-7%	• Moderate to high
Repayment period	• Up to 20 years	• Up to 35 years • Mortgage insurance available up to 25 years	• 5-10 years
Security	• Tied to property • Levy with priority lien status	• Tied to property	• No security • Based on personal credit
Loan transferability	• Transferable to new owner	• Somewhat transferable	• Not transferable
Eligibility restrictions	• Homeowners with mortgage insurance are excluded	• Mortgage cannot exceed appraised value, and are subject to mortgage stress tests, and credit scores.	• Depends on personal credit history
Capital source	• Municipal (grants and debt)	• Private capital (mortgage industry)	• Private capital or government

3.3 Summary of Stakeholder Perspectives

Financing is an important tool

- Can help address the cost barriers to purchasing a high-efficiency home
- Plays an important role in building market demand and industry capacity

Simplicity and accessibility are key

- Programs should be easy to navigate (for homeowners and builders)
- Eligibility criteria and costs should not exclude first-time buyers and renters

Government has a role to play

- Loan guarantees, loan loss reserve or other credit enhancements can help to reduce lending risk and support government priorities

Key challenges remain

- These include administrative capacity, lack of data and information, and a need for training and capacity building for industry (including real estate/appraisal sectors)

We spoke to representatives from:

- **6** Alberta homebuilders and associations
- **12** municipalities (plus CEIP Administrator)
- **5** financial institutions (including CMHC)

3.3 Detailed Stakeholder Feedback

Home Builders	• Support for tailored financing solutions as a way to attract more buyers to high-efficiency homes. • See financing as a tool to help homebuyers afford the higher costs of high efficiency homes. • Challenges with property appraisals undervaluing energy efficiency upgrades.
Financial Institutions	• Interested in growing efficiency-related lending to support corporate climate and ESG goals. • Reluctance about the priority lien status of PACE financing over mortgages in the event of defaults, affecting mortgage insurance policies.
Municipalities	• Recognize the role of financing as a tool to build market readiness for future building code updates. • Struggle with capacity to administer additional financing programs, especially smaller municipalities. • Some concerns about expanding PACE financing to new homes potentially reducing funds available for energy retrofits.

3.4 Key Delivery Partners and Roles

Based on our engagements with key Alberta stakeholders, we identified the following key delivery roles and partners for a potential new construction efficiency financing program in the province:

- **Financial Institutions:** responsible for **providing capital** – directly to homeowners via green mortgages or personal loans, or indirectly via a loan to a municipality, and for **administering and promoting** green mortgages and personal loans.
- **Home Builders:** responsible for **selling upgrades**, including support to help homeowners navigate financing options and programs; and as **contractors and service providers** to install desired energy upgrades.
- **Municipalities:** responsible for **providing capital** and **administration** support for PACE financing programs; and for general **outreach and education** to support all programs.

Other Delivery Partners

- **Alberta Municipalities**: the administrator for existing PACE financing (via CEIP)
- **CMHC**: revise policies that currently limit the market potential of PACE; continue to offer insurance incentives for high-efficiency homes
- **Federal and provincial governments**: provide financial and technical support including training and incentives
- **Appraisers:** ensure property values reflect energy savings
- **Energy Advisors/Auditors**: certify new home construction to ensure it meets higher standards

3.4 Key Delivery Partners and Roles

Program Delivery Role	Financial Institutions	Home Builders	Municipalities	Other delivery partners
Capital Provider	**Yes**		**Yes** PACE	**Yes** Federal or Provincial Green Loan
Program Administrator	**Yes** Green mortgage, personal loan		**Yes** PACE	CEIP Administrator (PACE) Federal or Provincial Gov't for Green Loan
Outreach and Education	**Yes** Green mortgage, personal loan	**Yes**	**Yes**	
Contractor and Service Provider		**Yes**		Energy Advisors
Credit Enhancement				CMHC (mortgage loan insurance); Federal and/or provincial government
Property Valuation				Home Appraisers

4. Opportunities Assessment

4.1 Indicators
4.2 Assessment: Indicator 1
4.3 Assessment: Indicator 2
4.4 Comparison of Financing Options

4.1 Indicator Definitions

The following indicators are used to assess the strengths and weaknesses of the three financing options explored in this study.

Indicator 1

Ability to Address Financial Barriers for Homeowners

This indicator explores the extent to which each financing option can help motivate and empower homeowners to assume the incremental costs of energy efficiency measures.

Considers:
Favourable financing terms; Access to adequate capital

Indicator 2

Ease of Implementation at Scale

This indicator considers how easily each financing option can be scaled under current circumstances.

Considers:
Ease of capitalization; Administrative complexity; Required resources; Ability to drive uptake; Interest from delivery partners

Indicator 1 | PACE Financing

Ability to Address Financial Barriers for Homeowners

+ STRENGTHS

- **Favourable Terms:** PACE programs offer favourable terms, with fixed and low interest rates, long repayment periods (up to 20 years), and significant financing (up to $50,000). To date, access to grants and low-cost capital has allowed most municipalities to offer below-market rates. For a new-build PACE program, municipalities will likely need to increase fees and interest rates, unless other grants are identified.
- **Relaxed Underwriting:** Less stringent underwriting, paired with robust consumer protections, tends to be a key feature of PACE programs. This recognizes the ability of municipalities to recover property taxes owed, and the expected energy savings that improve a household's discretionary income and their ability to afford repayments. CEIP programs do not consider a homeowner's creditworthiness or total debt load, relying instead on tax payment history.
- **Separate Financing:** PACE financing is separate from a mortgage, which could be advantageous for some homeowners (e.g. first-time buyers) who wish to finance energy upgrades without increasing the size of their mortgage.
- **Transferability:** PACE assessments allow homeowners to transfer the outstanding balance to the next owner, who benefits from the associated energy cost and comfort benefits, provided it is accepted by the new mortgage lender. This can help to motivate homeowners to assume the incremental costs of energy efficiency measures, even when they expect they may move before they are able to fully recoup their investment.

− WEAKNESSES

- **Limitations on Market Size:** CMHC does not currently provide mortgage insurance for homes with PACE assessments due to its priority lien status. This would effectively prevent buyers with a downpayment of less than 20% from participating in a PACE program. According to CMHC data, this could exclude the approximately one-third of properties that have mortgage insurance.[1]
- **Mortgage Lender Consent:** PACE assessments are senior to other forms of debt on the property, including mortgages. As such, consent is recommended from lenders before it is approved, and may even be required depending on the terms of the homeowner's mortgage agreement. This could delay or preclude PACE financing approval. The uncertainty around mortgage lender consent represents a risk to the homeowner, particularly when the decision on whether to include energy efficiency measures must be taken prior to finalizing a mortgage.

1. CMHC. Residential Mortgage Industry Data Dashboard. Accessed June 2024.

Indicator 1 | Green Mortgages

Ability to Address Financial Barriers for Homeowners

+ STRENGTHS

- **Efficiencies/Convenience:** Nearly all homebuyers take out mortgages. Underwriting processes and practices to qualify a homeowner for an energy efficient home is generally the same as a regular home. Integrating all construction costs in a mortgage thus allows both homeowners and financial institutions to benefit from loan origination, servicing time and cost efficiencies stemming from the convenience of a single application.
- **Improved Terms:** In general, mortgages offer lower interest rates and better terms than personal loans because the collateral (the home) reduces the risk to the lender. Moreover, mortgage insurance can improve access to financing and unlock more competitive interest rates.
- **Adapted Underwriting:** In some instances, financial institutions adapt their total debt service ratio and other due diligence requirements to account for an energy efficient home's expected energy cost savings, as this increases homeowners' purchasing power. This improves homeowner access to financing.

− WEAKNESSES

- **Limitations on Market Size:** In general, CMHC only insures mortgages with 25-year amortization periods or less. However, 30-year mortgage amortization periods will be offered exceptionally to first-time home buyers purchasing newly built homes, effective August 1, 2024. While this new policy expands the group of home buyers that can afford energy efficiency upgrades, a significant portion of homeowners will still be unable or unwilling to support the incremental costs of a larger mortgage without improved terms.
- **Limited Market Differentiation:** Because mortgage products already offer competitive interest rates, lenders cannot significantly reduce their premium. As such, lenders may only be able to offer a marginal interest rate reduction (e.g. 0.25%), which has a relatively small impact on total financing costs and monthly payments.

Indicator 1 | Personal Loans

Ability to Address Financial Barriers for Homeowners

+ STRENGTHS

- **Simplicity/Flexibility:** Personal loans are relatively easy to access. They offer flexibility around terms, including the duration and amount borrowed.

− WEAKNESSES

- **Market Terms:** Personal loans tend to offer less favourable interest rates and shorter repayment periods (under 10 years) than the other two options given the higher risk they represent for lenders in the absence of collateral. This results in higher monthly payments and total borrowing costs. The borrower's credit score is an important part of the loan underwriting and impacts the terms offered.
- **Reliant on Government Support**: Low or zero-interest green loan programs, such as the Canada Greener Homes Loan program, require funding and technical/administrative support from federal and/or provincial governments. This reduces their sustainability and long-term impact given the risks of policy changes.

Indicator 2 | PACE Financing

Ease of Implementation at Scale

+ STRENGTHS

- **Existing Resources and Infrastructure:** The CEIP administrator has gained valuable experience delivering PACE programs for home retrofits in different Alberta municipalities. This experience, alongside existing program infrastructure and materials, can facilitate the development of an efficient new homes stream to gain efficiencies and drive impact.
- **Program Promotion:** Existing CEIP programs across the province help build strong brand recognition, supported by marketing and engagement efforts. By building on CEIP's reputation, a new homes stream can benefit from homeowners' awareness and confidence in the program to drive demand. Moreover, municipalities have additional channels to further promote the program.
- **Alignment with Climate Action Commitments:** Expanding the scope of the CEIP would help Alberta municipalities meet their emissions and energy goals to achieve net zero by 2050.
- **Access to Private Capital:** Municipalities tend to have excellent credit ratings, allowing them to access low-cost capital. Moreover, PACE assessments are attached to private property, further reducing the risk to lenders. With growing data on the performance of PACE programs in Canada, and the need for alternatives to public funding, some municipalities have closed deals to leverage substantial private sector capital. Mobilizing private capital can help to scale PACE programs and achieve market transformation objectives.

− WEAKNESSES

- **Absence of Buy-In from Mortgage Industry:** Few mortgage lenders currently support PACE financing due to its relative novelty in Canada and the priority lien status of PACE assessments. Moreover, CMHC-insured mortgages do not currently permit PACE liens. These challenges could shrink the pool of eligible participants.
- **Constrained Municipal Powers and Resources:** Developing a stream to incorporate efficient new construction would require additional municipal resources and capacity. New homes are also built to higher efficiency standards, so a new homes program would have lower impact than a retrofit program. Despite the administrative support from the CEIP administrator, PACE program delivery remains complex and involves multiple municipal departments, resulting in material start-up and operating costs. The promotion, delivery, monitoring and evaluation of a new program could strain municipal resources. Some municipalities we spoke to preferred other options.
- **Limited Intake Capacity:** Municipalities do not have the capacity or available capital to accommodate a large volume of applications. This can result in funds being offered on an on-and-off basis and a long waitlist. This limits the impact of the initiative and can contribute to attrition.

Indicator 2 | Green Mortgages

Ease of Implementation at Scale

+ STRENGTHS

- **Existing Resources and Infrastructure:** Financial institutions have the financial and human capital to offer green mortgage loans, as well as the administrative processes and infrastructure in place to support loan origination and servicing. While few green mortgage products are currently offered within Canada, financial institutions can adapt and enhance their existing mortgage products to promote energy efficient homes.
- **Available Mortgage Insurance Rebate:** CMHC's mortgage insurance and Eco Plus products are offered at the national scale. However, other factors related to the design, delivery and promotion of this product have limited its uptake.
- **Alignment with Sustainability Commitments:** Green mortgages are one product that financial institutions can take to market to meet their established ESG and other sustainability objectives and targets. Moreover, there is an emerging, but limited, secondary market for green asset-backed securities such as this. At the same time, securitizing green mortgages can help leverage lower cost capital to support this growing asset class.

− WEAKNESSES

- **Market Coordination:** Without further coordination between financial institutions to offer clear, fairly consistent and widely available green mortgage products, borrowers are faced with several process pain points, including having to choose between different products that are not easily comparable. For instance, to seek out the best offer, homeowners must first identify lenders that offer green mortgages and confirm whether they offer similar or better terms than conventional mortgages, then provide evidence that they are meeting the required sustainability criteria through voluntary certifications and other mechanisms. Within secondary markets, the absence of a clear and uniform definition of green mortgages also makes it challenging for investors to assess the quality of underlying assets (e.g., defining a "high-efficiency home").
- **Marketing:** Green mortgage products currently lack effective marketing to consumers. Financial institutions generally have limited resources to promote their individual financial products, something that is often better accomplished by specialized third parties.

Indicator 2 | Personal Loans

Ease of Implementation at Scale

+ STRENGTHS

- **Existing Resources and Infrastructure:** As with green mortgages, financial institutions have the resources and infrastructure needed to deliver green personal loans. These are fairly simple to design and bring to market as it closely resembles existing consumer financial products.

− WEAKNESSES

- **Market Receptivity:** Green personal loans for home improvements that have been made available over the past decade have not generated significant interest from homeowners, in part due to too little promotion and differentiation from other financial products. As a result, financial institutions are beginning to withdraw these offers and focus on developing green mortgage and similar products to support energy efficiency projects. It is unlikely that this model would generate sufficient demand to truly reach scale without support to improve lending terms.

4.4 Comparison of Financing Options

Indicator	PACE	Green Mortgage	Personal Loan
INDICATOR 1 Ability to Address Financial Barriers for Homeowners	+ Favourable terms + Relaxed underwriting + Separate from mortgage + Transferable on sale	+ Familiarity and convenience + Competitive loan terms + Flexible underwriting	+ Simple and flexible
	- Excludes homes with mortgage insurance - May require mortgage lender consent	- Limitations on market size - Limited scope for interest rate reductions	- Unsecured - Less favourable loan terms - Reliant on government subsidy
INDICATOR 2 Ease of Implementation at Scale	+ Leverage existing program infrastructure and brand recognition + Aligns with municipal climate and energy commitments + Access to private capital	+ Leverage existing institutional capacity and capital sources + Aligns with corporate ESG and Net-Zero commitments	+ Leverage existing institutional capacity
	- Lack of mortgage lender buy-in - Competing municipal priorities and limited resources	- Limited products and market coordination - Lack of marketing and consumer awareness	- Limited support from lenders and other stakeholders

4.4 Comparison of Financing Options

Our assessment found that **PACE** and **Green Mortgages** both have several advantages for new home construction in Alberta, as well as challenges that need to be addressed. **Personal loans** are likely to be less attractive and offer limited potential for scale, due to their lack of security and less favourable loan terms.

Property Assessed Clean Energy (PACE):

- Offers several attractive features to homeowners, including favourable loan terms, less stringent underwriting, transferability and limiting additional mortgage capacity.
- Takes advantage of existing municipal CEIP infrastructure while supporting municipal climate goals. Municipalities could access private capital at competitive rates to scale their PACE programs.
- Excludes homes with mortgage insurance due to CMHC policies (~30% of the market). Could require consent from mortgage lenders.
- Risk diverting municipal resources and capacity away from bigger priorities, e.g. retrofitting existing low-efficiency housing

Green Mortgages:

- High level of familiarity and comfort among homeowners, as well as competitive loan terms and flexible underwriting. Homeowners can take advantage of mortgage insurance rebates to lower costs.
- Would leverage existing lender capacity and significant mortgage market; aligns with corporate ESG/climate commitments.
- Potential market is limited due to CMHC mortgage insurance restrictions. Few products on the market and limited consumer awareness.

5. Considerations and Key Takeaways

Key Takeaways and Insights

Based on our **analysis and engagements** with a range of Alberta stakeholders, the following insights emerged:

Insight 1: There is a significant opportunity in expanding the market for high-efficiency new homes in Alberta. With more than 20,000 new single-family housing starts annually, Alberta is among the fastest-growing provinces. Demand for housing is predicted to grow in the coming years. Increasing the energy performance of new single-family homes could avoid up to 42 Mt of GHG emissions by 2050 compared to current standards. This would also bring benefits to Albertans, through greater comfort and resiliency, improved air quality, and lower energy costs.

Insight 2: High-efficiency homes have higher upfront costs. Our analysis confirms that building to higher energy tiers would add between 1% (Tier 3) and 13% (Tier 5) to the cost of a new detached home. This translates to an incremental upfront cost of $5,000-$50,000, depending on the package of energy measures. Financing can play a key role in increasing access to the financial and other benefits of high-efficiency homes, by allowing homeowners to spread these costs over a 20-30-year period.

Insight 3: Green mortgages and PACE are the preferred financing options. Both offer favourable loan terms and have potential to increase access for homeowners and achieve scale. PACE can leverage the existing CEIP program infrastructure and branding, while green mortgages can take advantage of the mortgage industry's credibility and expertise. By contrast, personal loans are unlikely to be an effective financing solution due to higher lender risk and less favourable terms.

Insight 4: Both options have challenges that would need to be overcome. Most important, both would limit eligibility for the ~30% of homeowners with high-ratio mortgages who require mortgage insurance. Lenders are also concerned about the priority lien status of PACE, while some municipalities worry that expanding CEIP to new homes would put further strain on limited administrative resources. Further work is needed to understand and address these challenges, through data collection, education and policy changes.

Insight 5: Stakeholders are engaged and interested in further exploring options. Despite the challenges outlined above, a cross-section of stakeholders—builders, lenders and municipalities—expressed support in continuing to work towards a financing solution for new homes. Importantly, this should be part of a broader effort that includes homeowner education, workforce development, incentives and policy change.

Specific Considerations for Advancing PACE

Consideration	Challenge	Potential Path Forward
Gain mortgage lender and insurer buy-in	CMHC currently does not insure homes with PACE assessments due to their priority lien status. This disqualifies 30% of buyers, primarily younger, first-time homebuyers who can't afford a 20% down payment and are likely to be interested in high-efficiency homes. The priority lien status raises concerns among lenders about potential losses in case of default, requiring homeowners to obtain lender consent, which can hinder mortgage approval.	**Relax CMHC Restrictions:** CMHC should consider relaxing its restrictions on insuring homes with PACE assessments, similar to the 2016 U.S. Federal Housing Authority proposal to prioritize only delinquent PACE payments. CMHC and administrators should collect data on default rates for PACE properties to support policy changes. **Establish Loan Loss Reserve Fund:** The Province or municipalities could create a loan loss reserve fund (LLR) to cover any losses from PACE defaults, modeled after California's successful PACE LLR program. **Engage Mortgage Industry:** Emphasize to mortgage lenders that high-efficiency homes reduce energy costs, increasing a household's ability to support greater debt payments. With more performance data and standardization, lenders can adjust underwriting criteria for PACE properties to reflect lower energy costs and higher debt capacity
Clarify CEIP-enabling legislation	The Municipal Government Act's Clean Energy Improvements Regulation governs clean energy improvement taxes, currently applied to residential and commercial PACE programs for existing buildings in Alberta. However, there is no precedent for using this tax mechanism for high-efficiency new homes.	**Obtain Legal Opinion:** Seek a legal opinion to clarify how the existing legislation would apply to a new stream focused on energy-efficient new homes. **Modify Provincial Legislation:** Alternatively, amend provincial legislation to explicitly permit clean energy improvement taxes for energy-efficient new homes, ensuring clear legal support for this new application. An amendment could also clarify that the priority lien status only applies to the delinquent portion of the PACE loan, reducing potential mortgage lender concerns.
Explore Feasibility of Partnering with a Private Lender	Current legislation may be unclear on whether municipalities can partner with private financial institutions to offer direct homeowner financing, while maintaining a PACE lien on the property.	**Obtain Legal Opinion:** Seek a legal opinion to determine if municipalities are permitted to partner with private lenders to offer homeowner financing directly through them, while maintaining the PACE lien. **Leverage Administrative Efficiencies:** Partnering with private lenders could reduce municipalities' financial and administrative responsibilities, making local programs easier to scale, as seen in successful U.S. programs. **Ensure Enabling Legislation and Interest:** This model, new to Canada, may require enabling legislation, interest from financial institutions, and significant upfront investment to negotiate terms with financial partners.

Specific Considerations for Advancing Green Mortgages

Consideration	Challenge	Potential Path Forward
Extend Mortgage Amortizations for New Energy Efficient Homes	Standard 25-year amortization periods in Canada may limit access to energy efficient homes due to higher monthly payments.	**Extend Amortization Periods:** Allow longer amortization periods for new energy efficient homes to lower monthly payments and improve affordability. While this increases total interest paid and slows equity accumulation, it can make high-performance homes more accessible. For example. RBC now offers a 35-year Green Home Mortgage with a range of incentives; however, this is only available to homeowners who can afford a 20% or higher downpayment. **Adopt Policies for Insured Mortgages:** The Government of Canada recently allowed first-time homebuyers of new builds to extend amortizations to 30 years (Budget 2024). Expanding this to all homeowners purchasing an eligible high-efficiency home, regardless of downpayment size, can further enhance access and build demand.
Value Energy Savings in Mortgage Processes	Most mortgage lenders do not account for the lower energy costs of energy efficient homes in their debt service ratio assessments, potentially disqualifying some households from obtaining mortgages for these homes.	**Incorporate Energy Savings:** Encourage mortgage lenders to include potential energy savings in their debt service ratio assessments to qualify more households for mortgages on energy efficient homes. Similarly, lenders should account for energy cost savings in their mortgage stress tests so as not to unfairly disadvantage high-efficiency homes. Supportive lenders and builders should work with the home building and appraisal industries to ensure the benefits from energy performance upgrades are valued, as this impacts loan-to-value calculations.
Support a Secondary Market for Green Home Mortgages	The secondary market for green mortgages in Canada is underdeveloped, limiting access to low-cost private capital for financing green mortgages with favorable terms.	**Develop Securitization:** Support the green mortgage bond market to reach greater scale and maturity. This can provide the volumes needed for aggregation and securitization to attract private capital interested in green financial products. **Create a Consistent Bond Framework:** Establish a clear and transparent definition of the underlying assets and their quality, increase market activity volume, and reduce the cost of issuing, certifying, and monitoring green bonds.

General Financing Design Principles

Regardless of which financing option is pursued, we propose – based on stakeholder input and our extensive experience developing efficiency financing programs across Canada – the following general design principles for a future Alberta program:

1. Prioritize consistency & simplicity

- Favour consistent eligibility criteria across programs and financial products to reduce complexity and facilitate the process of stacking different offers (e.g. incentives, loans).
- Leverage existing certifications and tools to assess energy efficiency.

2. Offer streamlined process for added convenience

- Streamline the homeowner financing process with quick turnaround times.
- Offer straightforward application documents that are easy for homeowners to access, complete and submit.
- Ensure homeowners have the information and support they need to obtain relevant home certifications when this process is not led by home builders.

3. Improve access to financing

- Account for lower energy bills in the debt-to-income qualifying ratio.
- Consider offering interest rate discounts, lower upfront fees, and other incentives.
- Connect homeowners with available rebates and incentives.
- Offer firm mortgage approval during the construction period until the closing date

4. Deliver clear and compelling messaging

- Develop an effective marketing strategy and supporting materials tailored to contractors and to homeowners.
- Ensure documents are written in plain, succinct, and easy-to-understand language.
- Ensure that key details of the financial offering are widely accessible and promoted.

5. Build strong relationships with home builders

- Empower home builders to effectively communicate the benefits of energy efficient homes. Attractive financing can facilitate the purchase of an energy efficient home only once home buyers are convinced of their benefits.
- Ensure invoice payments to home builders are not delayed.

Appendix

Appendix

Stakeholder Perspectives: Key Takeaways

1	**Simplicity and Accessibility**	• Financing programs must be straightforward and easy for homeowners to navigate. Complex processes and extensive paperwork deter consumer participation. • Streamlining financing with existing mortgage approval processes and construction schedules is crucial to avoid delays and facilitate timely decision-making. • Effective marketing at the point of sale is necessary to communicate the benefits of high-efficiency homes, such as energy savings, comfort, and durability
2	**Borrowing Costs**	• Offering financing at competitive interest rates is viewed as important, especially in the current environment of rising borrowing costs. Low or zero-interest rate programs have experienced notable demand, exemplified by municipal CEIP programs and the federal Greener Homes Loan program.
3	**Complementary Incentives**	• Rebates, grants, or other incentives may be needed to improve the financing business case. These incentives can reduce the loan size and the additional debt homeowners must take on. • For renters or low- and middle-income households who cannot afford or do not qualify for loans, non-financing incentives may be a more viable option.
4	**Government Role**	• The federal and provincial governments play a crucial role in supporting these programs by providing grants/rebates, offering concessionary finance, or enhancing credit (e.g., by enhancing CMHC mortgage insurance) to secure lower interest rates. • Governments can also raise additional funds for financing programs through mechanisms like issuing green bonds.
5	**Scalability & Sustainability**	• Current municipal-run PACE programs in Alberta are limited by capital availability and administrative capacity, hindering industry uptake and support. • Attracting private capital is vital for scaling programs to reach a broader market and ensure longevity. However, private financing often comes with higher interest rates, potentially deterring some homebuyers.

Appendix

Stakeholder-Specific Feedback

Stakeholder group	Opportunities	Risks
Municipalities	• Support climate and energy goals • Address gaps left by higher government levels • Increase new build energy performance • Leverage experience in marketing and lead generation.	• Limited capacity and resources • Limited eligibility for certain groups (e.g., renters, low-income households) • Barriers for multi-unit residential buildings and affordable housing • Jurisdictional issues with new construction • Better returns from retrofits • Challenges in linking finance to verifiable benefits • Limited capacity for verification.
Home Builders	• Validate builders exceeding code standards • Enhance consumer access to financing • Support larger builders already meeting higher standards • Streamline financing approval processes	• Property valuation issues • Ensuring financing is accessible early in construction and sales process • Rising costs and interest rates municipal program delays complex existing programs need for lender data and benchmarks industry capacity challenges
Financial Institutions	• Align with corporate ESG and net-zero targets, • Potential to achieve higher returns from green bonds, provide competitive loans to municipalities, differentiate products from other lenders energy savings lead to lower risk and default rates.	• Challenges with PACE priority lien positions and CMHC policy to not offer mortgage insurance • Limited customer demand for high-performance homes / green financial products • Inability to offer lower rates without government support • Valuation and appraisal issues

Feedback on Financing Options

	PACE Financing	Green Mortgage	Personal Loan
Key Advantages	• Existing CEIP program reduces startup costs and leverages marketing capacity • Competitive interest rates (2-4%), long repayment periods (up to 20 years), and up to $50,000 loans • Separate from mortgage, avoiding higher LTV ratios and mortgage insurance • Transferable financing, benefiting homeowners and builders • Can finance energy upgrades without increasing mortgage size	• Familiarity and trust in mortgages • Streamlined process for energy upgrades for higher income buyers • Generally low interest rates due to high security and collateral	• Interest-free loans (e.g., Canada Greener Homes Loan) can be attractive • Can be unsecured, making them accessible without home equity
Key Drawbacks	• Legal clarification needed for new homes • Requires lender consent due to lien priority, potentially delaying approval • CMHC policy against mortgage insurance for homes with PACE liens • Limited municipal capacity and focus on existing buildings rather than new construction • Lack of clear baseline for comparing costs and benefits in new construction	• Limited understanding of energy efficiency by lenders • Appraisers may undervalue energy efficiency improvements • Start-up costs for establishing energy-efficient mortgage programs	• Higher interest rates and shorter repayment periods compared to mortgages • Limited to borrowers with good credit • Higher risk for borrowers if property value does not reflect upgrade costs • Reliance on government subsidies for interest-free programs, limiting sustainability
Other options (not explored in this study)	**Grants, rebates and financial incentives**: • Grants and rebates effectively address upfront cost barriers and require no repayment • High cost and limited scalability, should target specific demographics or measures	**Interest rate buydowns**: • Interest rate buy downs reduce monthly payments and build market demand • Expensive to administer, especially for long-term financing	**Leasing**: • Leasing can lower monthly costs for large energy-efficient measures • Potential complexity in administration and management • Limited by builder participation and acceptance by homebuyers

Archetype Analysis Assumptions

Energy cost assumptions:

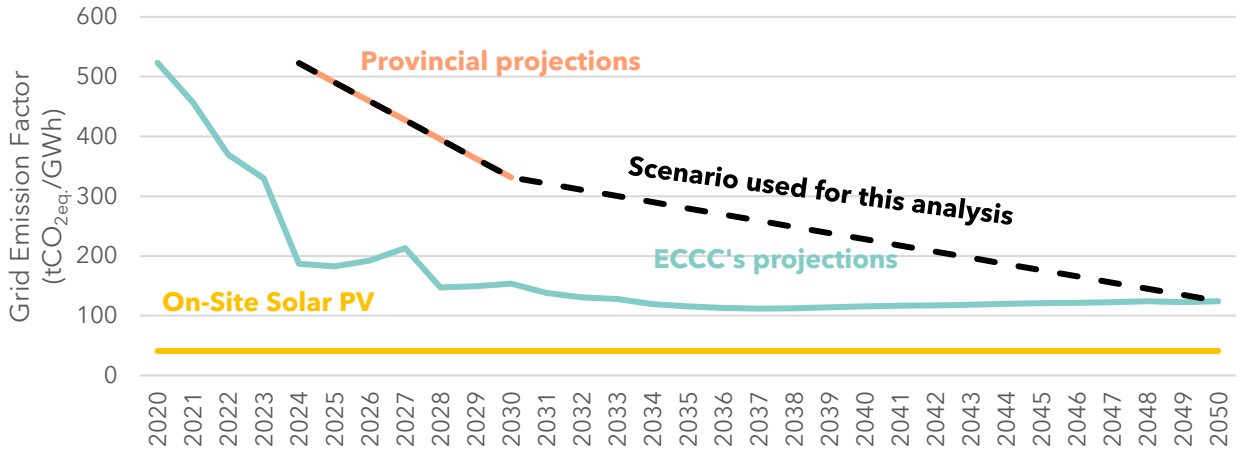
	Hypothesis
Natural gas cost	$0.27/m³ ($7/GJ)
Electricity cost	$0.12/kWh
Energy cost growth	3%

Natural gas and electricity costs includes variable transmission and distribution costs and excludes all fixed costs.

Electricity grid emission factors:

Figure A1 shows the grid emission factors used for the studied period. Since the electricity use of new homes is incremental to the current consumption, marginal emission factors are assumed, rather than the average emission factor. Provincial projections are used to 2030. Afterwards, the emission factors are interpolated to reach the federal government's 2050 projections. Emissions from on-site solar PV generation are maintained constant throughout the studied period.

Figure A1. Alberta electricity grid emission factors, 2020-2050



“NO DISCLAIMERS” POLICY

This report was prepared by Dunsky Energy + Climate Advisors, an independent firm focused on the clean energy transition and committed to quality, integrity and unbiased analysis and counsel. Our findings and recommendations are based on the best information available at the time the work was conducted as well as our experts' professional judgment. **Dunsky is proud to stand by our work.**