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City of Saskatoon
Sustainability

Appendix 2

FEASIBILTY STUDY

Industrial, Commercial, Institutional and Multi-Unit Residential Building Energy and Water Retrofit Program in Saskatoon

January 2024

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1 Executive Summary

The Industrial, Commercial, and Institutional (ICI) building sector is responsible for approximately 35% of Saskatoon's total community greenhouse gas emissions (GHGs)[1]. Research in this sector finds that energy efficiency and retrofit programs can provide significant economic, social, and environmental benefits such as:

- Reducing energy and utility costs,
- Reducing GHG emissions,
- Providing comfort and safety to building occupants,
- Enhancing building resiliency,
- Stimulating the local economy by creating jobs within the building retrofit industry, and,
- If programs are designed appropriately, helping to alleviate energy poverty.

The City of Saskatoon (City) has a target to reduce GHG emissions to net-zero by 2050. Saskatoon's *Low Emission Community Plan* (LEC Plan) includes actions calling for the decarbonization of all of Saskatoon's new and existing buildings. LEC Action 11 specifies that the City should incentivize and later mandate ICI building owners and operators to perform deep energy retrofits, estimating that 3,469,000 tonnes of CO_2e could be reduced through this action.

The ICI Building Energy and Water Retrofit Program Feasibility Study examines opportunities for the City to offer an ICI building retrofit program, which would include multi-unit residential buildings (MURBs). The goal of this study is to consider best practices, stakeholder preference, municipal context, and resource limitations to determine what ICI building energy retrofit programs would provide the greatest benefits at the lowest cost and risk to the City.

As part of the study, key barriers that hinder the implementation of efficiency upgrades in the ICI building and sector were identified. These barriers were ascertained through research (refenced in Section 6) and built upon through public engagement (see Section 5). Engagement activities included two surveys, and consultations with stakeholders. Building owners were asked what barriers exist when considering energy retrofits. The barriers identified in this report include:

- High cost, and low return on investments for new energy efficient equipment and technologies,
- A lack of access to capital to make energy and water efficiency improvements,
- A lack of awareness, knowledge, and decision-making capacity to implement energy-efficient technologies and strategies, and
- A lack of existing programs to support low carbon building retrofits.

The study includes a municipal best practice scan to identify potential program efficiency instruments that municipalities, provincial governments, and utility providers

[1] City of Saskatoon. Climate Action Plan – Progress Report. (2021). Retrieved from https://www.saskatoon.ca/sites/default/files/Climate%20Action%20Plan%202022-Nov7-digi.pdf

throughout Canada offer to help reduce the barriers building owners face, while promoting and incentivizing building decarbonization efforts.

Types of efficiency instruments currently being offered by municipalities, provincial governments, local utilities, and non-profit groups include:

- Financing,
- Financial incentives,
- Benchmarking, labelling and disclosure (BLD) tools, and
- Capacity building, networking, and education.

The efficiency instruments were identified through online research, literature review, and interviews with municipal staff. Interviews were conducted with Calgary, Edmonton, Winnipeg, Toronto, and Vancouver as they were currently offering ICI building energy and water efficiency programming and voluntary and/or bylaw mandated benchmarking, labelling and disclosure (BLD) programs. Section 7 – Program Instruments, provides a detailed discussion on each type of instrument including a costs and benefits analysis and examples of municipal programs.

Financing, and financial incentives were found to provide the most significant combined benefits due to their direct ability to encourage retrofits and remove financial barriers. At the time this study was completed, three program utilizing the commercial property assessed clean energy (C-PACE) financing mechanism had been offered throughout Canada including Edmonton's Clean Energy Improvement Program, and Toronto's High-Rise Retrofit Improvement Support and Taking Action on Tower Renewal Programs, with a fourth program expected to launch in 2024. Section 7.1 provides a detailed discussion on municipal financing program offered throughout Canadas. Many municipalities and other jurisdictions (federal/provincial government or utilities) were also offering various forms of financial incentives (see Section 7.2 for a discussion on financial incentive programs).

The efficiency instruments were then used to develop four ICI building retrofit programs, ranging from a small pilot to a fully scaled program, and then analyzed against a set of principles to determine which provided the most benefits in terms of:

- Financial sustainability,
- GHG reduction potential,
- Potential uptake of the program,
- Preference of stakeholders,
- Equity considerations, and
- Compatibility with existing City programs, and precedents in other jurisdictions.

The four ICI building retrofit pilot programs include:

A. Small-Scale C-PACE Pilot Program for MURBs.
B. Medium-Scale C-PACE & Commercial Energy Assistance Pilot Program (CEAP) for Small and Medium Size Businesses, Non-Profits and MURBs.
C. Full-Scale C-PACE Program for ICI/MURB buildings.
D. No C-PACE Program; Implement BLD Program with a Dashboard.

Table 1 provides a description and comparison of the four pilot programs, including the targeted number of building retrofits and subsector, potential GHG emission reductions, and total program costs.

Table 1 - Comparison of ICI Pilot Programs

	ICI Program A: Small-scale C-PACE Loan Program for MURBs	**ICI Program B: Medium-scale C-PACE loan and CEAP Pilot Program for Medium Size Businesses, Non-Profits and MURBs**	**ICI Program C: Full-scale C-PACE Program for ICI Buildings and MURBs**	**ICI Program D: BLD program & Interactive dashboard**
Description	Program A would run for 3 years. Equity will be considered through program design.	Program would run for 3 years. Program includes a CEAP component.	Program C would run for 3 years. Designed to include an income-qualified component.	Program D would run for 2 years. No specific equity components / design.
Target Number of Building Retrofits & Subsector	15 MURBs.	50 Small to medium sized commercial buildings, MURBs, and non-profit.	90 Depends on design.	No immediate retrofits expected.
Potential GHG Reductions	591 tonnes of CO2e.	1,486 tonnes of CO2e.	13,685 tonnes of CO2e.	Non-quantifiable No immediate reductions.
Total Program Cost	**$6,857,000**	**$22,720,000**	**$40,895,000**	**$395,000**
Loan Capital Required	$6,750,000	$22,500,000	$40,500,000	N/A
Operating Cost	$107,000	$220,000	$395,000	$259,000
Administration Fee	~$7,150/participant (1.6% of loan amount) Recovers the operating cost over the term of loan.	~$9,000/participant (2% total loan amount) Recovers the operating cost over the term of loan + $230,000 for the CEAP component.	~$9,000/participant (2% total loan amount) Recovers the operating cost over the term of loan + $415,000 for an income-qualified component.	N/A

In conclusion, ICI Program A, small-scale C-PACE program for MURB's was found to be the most suitable for the City to implement at this time. It requires the lowest loan capital, has the lowest uptake risk, and is less complex than programs B and C, allowing the City to build upon the success of Saskatoon's Home Energy Loan Program (HELP) to quickly implement a pilot program. The program can be designed to be fully financially sustainable using a relatively low administration fee of 1.6% and may be

eligible for FCM funding. While ICI Program A has fewer GHG reductions than the other programs, it provides an opportunity to establish a base program that can be built upon to realize further emission reductions as the program is scaled. Additionally, designing a pilot C-PACE program for the MURB subsector allows energy and water utility savings to be passed on to multiple tenants with potential to reduce the effects of energy poverty while increasing occupant comfort and safety. MURB buildings also offer enormous potential to scale up due to the ease of replication in other ICI buildings with similar architypes.

Furthermore, BLD programs were found to be essential tools that can help organizations understand their energy use to identify inefficiencies and set baselines for improvement, inform policies, and encourage behavioral change. BLD programs are seen as foundational in the effort to combat climate change and are being used by numerous municipalities (as shown in Table 5) either as a voluntary or mandatory mechanism. This study recommends that, as a minimum, the City implement a free version of the BLD program using Energy Star Portfolio Manager (ESPM), using existing capital funding. Section 7.3 provides a detailed discussion on BLD programs and ESPM. Participation in the BLD program will be built into ICI programs A-C as a prerequisite for participation during program design, aiding in the continuity and uptake of the BLD program.

This study reinforces that the City could accelerate building efficiency retrofits by offering financing, incentives, education, and decision-making supports to building owners and property managers. Programming for the ICI/MURB building sector would accelerate building efficiency upgrades, helping to build climate change resilience, maximize owner and occupant comfort and benefits, and reduce building associated GHG emissions.

The proposed ICI Program A is based on lessons learned on residential PACE financing (HELP) and scaled in alignment with available resources, with an opportunity to grow the program in the future. Through the implementation of a small-scale PACE offering for MURB's and benchmarking, labelling and disclosure, Saskatoon can progress building energy efficiency in the ICI/MURB sector in alignment with City Council's strategic priorities and climate actions.

2 Introduction

The industrial, commercial, and institutional (ICI) building sector, including multi-unit residential buildings (MURBs), is the largest contributor to greenhouse gas emissions (GHG's) in Saskatoon (City). In 2021, this sector produced about 1,246,600 tonnes of CO_2e, accounting for approximately 35% of the total GHGs produced in Saskatoon[2]. To achieve the City's GHG emissions reduction target of net-zero by 2050, energy retrofits for these building types will need to be accelerated.

This study investigates initiatives to progress energy efficiency and promote renewable energy generation which would accelerate the GHG reductions critical in this sector to meet Saskatoon's emissions target. The study examines the feasibility of an energy and water retrofit program for the ICI/MURB building sector that reduces GHGs while at the same time considers energy poverty, enhances efficiency and resilience, and stimulates the local economy.

Many municipalities, provinces, and utility providers throughout Canada offer energy and water efficiency programs to incentivize action, drive decarbonization efforts, and meet emission reduction targets, which will be discussed further in Section 7. Incentive and education programs can support a building-as-a-whole approach to energy efficiency and help to plan for upfront retrofit costs. As most ICI/MURB building emissions are beyond the direct control of the municipality, City programs can support commercial and industrial businesses to achieve GHG reductions while saving money and benefiting the overall economy[3].

The study lays the foundation for an efficiency program which benefits the ICI/MURB sector by examining current demand for energy and water, existing programming available, and barriers and interest in adoption, explored through public engagement. Informed by best practice research, instruments are presented and analyzed, such as financing, incentives, and enabling activities. The instruments are bundled into programs that could be implemented at the City of Saskatoon and the feasibility of these programs is explored; sub-sectors that the final program could focus on are examined, such as businesses, tenants/renters, large property owners, associations, and other stakeholders.

2.1 Methodology

Research was conducted through literature and best practice reviews of energy and water efficiency ICI/MURB building programs implemented in other cities. Calgary, Edmonton, and Winnipeg reviews were conducted first as they are comparable benchmarks to Saskatoon in terms of culture, stage of local programming being offered, provincial and municipal regulations, climate (extreme temperatures), and GHG emission reduction targets. The review was then expanded to municipalities that are

[2] Ibid. footnote 1
[3] SREDA – HELP Economic Impact Study (2022). Retrieved from https://pub-saskatoon.escribemeetings.com/filestream.ashx?DocumentId=179959

leading in the field of efficiency programming and regulations such as Vancouver, Ottawa, Toronto, and Montreal. A total of 10 municipalities were reviewed.

The research findings were then used during public and stakeholder engagement to gather insights and opinions regarding the suitability and applicability of the identified best practices through surveys and one-to-one meetings.

A cost-benefit analysis was performed for the program instruments that emerged from the best practice research and stakeholder consultations. This analysis aimed to evaluate the financial implications and potential benefits associated with implementing these instruments into a program for the Saskatoon ICI/MURB sector.

By following this methodology, the feasibility study was able to incorporate industry expertise, public and stakeholder perspectives, and economic considerations to bundle the program instruments into four separate ICI programs.

The programs were then compared and assessed using the overarching principles that were used to design HELP. The overarching principles will be further introduced and discussed in Section 8 – ICI Pilot Programs.

2.2 Strategic Alignment

In April 2023, City Council adopted a net-zero by 2050 greenhouse gas reduction target for Saskatoon. This target replaced the previous targets of:

- A 40% reduction in GHG emissions for the City as a corporation by 2030, with a further reduction of 80% by 2050, and
- A 15% reduction in broader community emissions by 2030, with a long-term goal of an 80% reduction by 2050.

Interim targets for 2030 will be established through the LEC Plan Refresh, expected in 2024/2025.

The City's LEC Plan a 30-year roadmap outlining the steps required to achieve the 80% GHG reduction target. Among the 40 recommended actions in the plan, 5 actions pertain to improving the energy and water performance of the ICI/MURB building sector:

- Action 11 to "Incentivize and later mandate ICI/MURB owners and operators to perform deep energy retrofits", with the milestone target that "through envelope and mechanical system retrofits and renovations, 50% of existing buildings are 50% more energy efficient by 2030, 90% by 2050",
- Action 12 to "Require energy efficiency improvements residential and ICI building lighting systems",
- Action 15 to "Retrofit ICI heating and cooling systems with ground-source or air source heat pumps",
- Action 26 to "Reduce residential and ICI water use through education programming and water efficiency"; and a 20% reduction in outdoor water use and a 30% reduction in indoor water use by 2050 through residential and commercial education and water efficiency incentive programs, and

- Action 33 to “encourage existing ICI building owners and mandate new ICI buildings to install solar PV systems”.

The LEC Plan estimates that achieving these targets by 2025 would result in 3,469,000 tonnes of cumulative CO2e under action 11 and 147,000 tonnes under action 26.

The *City of Saskatoon’s 2022-2025 Strategic Plan* establishes Environmental Sustainability as a City Council priority and help transform Saskatoon as a high per capita emitter of greenhouse gases to a model city of innovation in energy conservation, renewables, waste diversion, and natural area protection. The 2022-2025 Strategic Plan refers directly to implementation of the LEC Plan, *Corporate Climate Adaptation Plan*, *Solid Waste Reduction and Diversion Plan*, and the *Green Infrastructure Strategy* and implementation plan within their proposed timeframes.

2.3 Triple Bottom Line Improvement Review

A Triple Bottom Line (TBL) Improvement Review, in accordance with *Council Policy C08-001 - Triple Bottom Line,* was conducted to assess the potential benefits and opportunities associated with an energy and water retrofit program for the ICI/MURB building sector. In conducting the review, administration relied on the expertise of the project team and subject matter experts from the HELP team. The full TBL Improvement Review in Appendix A documents benefits and opportunities in more detail.

Overall, the TBL review indicates that a building energy and water retrofit program for the ICI/MURB sector could achieve numerous environmental, economic, and social benefits. The review shows that the social benefits of the program could be enhanced by incorporating design elements that improve equity.

2.3.1 Environmental

Programming for the ICI/MURB sector in the form of financing, financial incentives, and/or enabling activities could provide multiple environmental benefits such as a reduction in energy and water usage, a reduction or avoidance of GHGs and increased renewable energy generation capacity. The reduction of GHGs would be achieved through energy and water use reductions and increases in renewable energy generation.

2.3.2 Economic

From an economic perspective, an energy and water retrofit program for the ICI/MURB sector could stimulate the local economy through a direct investment in local job creation in the construction, renovation, and skilled trades sectors.

Significant savings for building owners and renters can also be realized, which can help reduce energy poverty and the effects of rising energy costs. Businesses that invest in energy and water efficiency or renewable energy can improve their competitiveness by reducing their operating costs and improving their bottom line, which can help them to stay competitive in their respective markets.

Energy-efficient buildings are often more attractive to potential buyers or renters due to lower operating costs and increased safety and comfort. Commercial properties with energy-efficient features tend to have higher resale values. While there is no direct

financial payback from financial incentives to the City, the municipality collects higher tax revenues from properties as their values appreciate, which can be reinvested into public services and infrastructure. With a reputation for energy efficiency, the City can attract businesses and residents seeking sustainability and lower operating costs. This, in turn, enhances its economic competitiveness and can lead to more business investments and population growth.

2.3.3 Social

Improved energy efficiency in commercial buildings can lead to improved indoor air quality and reduce the number of pollutants present in the air, improving the health of occupants.

If designed through an equity lens, an energy and water efficiency retrofit program could achieve social goals such reducing energy poverty. Elements that could be included in the program design to make the program more equitable are:

- Waiving or reducing program administration fees for affordable housing or income-qualified participants,
- Providing favorable rates and flexible repayment terms (5 – 20 years based on the participants choice) for financing programs,
- Providing rebates or incentives on equipment and energy audits targeted to affordable housing or income-qualified participants,
- Providing the HELP pre-vetted contractor list to participants to use for their renovation projects. This reduces the risk that participants use a less reputable contractor,
- Using plain language and clear communication for application materials and contract documents,
- Applications can be available in multiple languages, and formats including online, in person or over the phone,
- Eligibility requirements for the program can exclude a requirement for credit checks, financial statements, and mortgage verification, and
- Set the minimum spend for program participation low (for example at $10,000) to be inclusive of smaller retrofit projects.

3 Current and Future Projected Energy and Water Demand for the Saskatoon ICI Building Sector

In 2021, Saskatoon's community GHG emissions consisted of 3,509,600 tonnes of CO_2e emitted. From this:

- 62% of emissions were attributed to stationary energy use (the use of natural gas, propane, and electricity to heat, cool and power residential, industrial, commercial, institutional, and municipal buildings),
- 35% produced by ICI sector buildings, and

- 26% produced by the residential sector[4].

Furthermore, the LEC Plan Business as Planned (BAP) scenario predicts that by 2050, city's GHG emissions are expected to increase to 4,350,000 tonnes CO_2e[5].

Saskatoon relies primarily on non-renewable and high carbon-intensive energy sources such as coal and natural gas for heating, cooling, and power supply. Saskatchewan's electricity system is the third most emissions-intensive in the country[6]. In 2022/23, provinces electricity was generated by:

- 65% from coal and natural gas[7];
- 21% from hydroelectricity;
- 11% from wind;
- 2% from Solar; and
- 1% from other (imports)[8].

The ICI building sector in Saskatoon encompasses a diverse range of establishments, including offices, retail stores, educational institutions, healthcare facilities, MURBs, and manufacturing plants.

Energy consumption in the ICI/MURB sector is influenced by several factors, including building size, occupancy rates, operational hours, equipment types, and the nature of activities conducted within the establishments. Heating, ventilation, and cooling (HVAC), and lighting significantly contribute to energy usage in ICI/MURB buildings.

Figure 1 shows an analysis of energy consumption in buildings, which was completed as part of the LEC Plan BAP scenario. When examining end-use breakdown, it was identified that space heating will constitute the largest portion of energy use between 2016 and 2050. The demand for space heating is projected to rise by almost 94% between 2016 to 2050. Similarly, water heating is expected to consume 112% more energy in 2050 as compared to 2016.

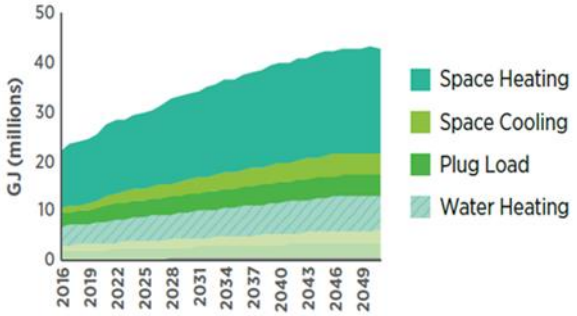

Figure 1 - Saskatoon building energy by end use 2016-2050 (projected). Source LEC Plan – BAP Scenario.

[4] Ibid. footnote 1
[5] City of Saskatoon, Low Emissions Community Plan (2019). Retrieved from https://www.saskatoon.ca/sites/default/files/documents/low_emissions_report-aug8_web.pdf
[6] Efficiency Canada. The Canadian Energy Efficiency Scorecard: Saskatchewan (2023). Retrieved from https://www.scorecard.efficiencycanada.org/wp-content/uploads/2022/11/SK.pdf
[7] Producing electricity by burning coal and natural gas results in GHG emissions and impacts the emissions intensity of the grid.
[8] SaskPower. 2022-23 Annual Report (2024). Retrieved from https://www.saskpower.com/-/media/SaskPower/About-Us/Reports/Report-AnnualReport-2022-23.ashx

As shown in Figure 2, in 2016, buildings used 22.1 million GJ of energy. The LEC Plan BAP Scenario projects that by 2050, building consumption will increase by almost 110%, to 46.4 million GJ. It is also projected that wastewater production and treatment will increase by almost 90% by 2050.

The BAP Scenario projections assume that increasing energy demands will primarily be driven by population growth. With population growth, comes increases in employment, number of cars and buildings in use, water, and wastewater treatment, and GHG emissions[9].

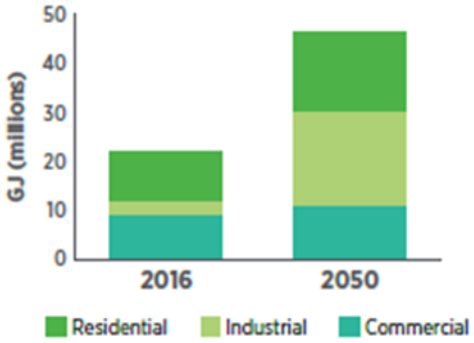

Figure 2 - Saskatoon energy consumption by building type 2016 and 2050 (projected). Source LEC Plan – BAP Scenario.

It is predicted that with the increased demand for energy, the price of energy will rise substantially by 2050. The model predicts an 84% increase in energy demand, from 38 million gigajoules (GJ) in 2016 to 70 million GJ by 2050 and an increase in energy prices of 2% annually going from $866 million spent per year in 2016 to $2 billion spent per year in 2050[10]. Furthermore, in 2023, the Water, Sewer, and Infrastructure rates increased by 3.4%[11].

In order to achieve energy use and emissions reductions in the ICI/MURB building sector, energy and water efficiency retrofits we will be required.

3.1 Energy Poverty

A household or business is defined as experiencing energy poverty if they spend a disproportionate amount of their income on energy needs. This is most often considered to be in households that spend 6% or more (approx. twice the national median) of their after-tax income on energy bills. Households with low-income levels are more vulnerable to energy poverty than those with high levels of income[12]. In 2020, the highest rates of household energy poverty (spending 6% or more of their income on energy) were found in the Pleasant Hill (31%), Hudson Bay Park (30%), Caswell Hill (32%), and King George (36%) areas in Saskatoon[13].

In Saskatoon, approximately 40% of homes are MURBs and a substantial part of the units are rental units[14]. Table 2 below, shows the number and percent of MURB

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[9] Ibid. footnote 5
[10] Ibid. footnote 5
[11] City of Saskatoon Water. Wastewater and Infrastructure Rates (2023). Retrieved from https://www.saskatoon.ca/sites/default/files/Water%20Sewer%20Infrastructure%202023%20and%202022-Compare%202023%20and%202022%20Rates%20%28metric%29.pdf
[12] City of Saskatoon. Energy Poverty in Saskatoon. Retrieved from Append 1 - Energy Poverty in Saskatoon.docx (escribemeetings.com)
[13] Ibid. footnote 12
[14] City of Saskatoon. Growth Monitoring Report (2022). Retrieved form https://www.saskatoon.ca/sites/default/files/documents/Growth%20Monitoring%20Report.pdf

dwelling units[15] located in Saskatoon neighbourhoods experiencing the highest rates of energy poverty.

Table 2 - Percent of MURB Dwelling Units in Saskatoon Neighbourhoods Experiencing Energy Poverty

Saskatoon Neighbourhood	Total Number of Dwelling Units	Total Number of MURBs	Percent of Dwelling Units (MURBs)
Pleasant Hill	2303	1403	61%
Hudson Bay Park	984	295	30%
Caswell Hill	1680	414	25%
King George	865	40	5%

When equity considerations are embedded in program design, a building retrofit program could aid in alleviating energy poverty in the local community.

3.2 Building Code

Saskatoon adheres to the National Research Council of Canada's (NRC) National Energy Code of Canada for Buildings (NECB), 2017 and the Energy Efficiency of the National Building Code (NBC), 2015 as the minimum standard for the construction and renovation of buildings throughout the province[16]. The NRC and the NECB set out technical requirements for the energy efficient design and construction of new buildings. Adopting the 2020 editions of the NBC, the NEBC, the National Plumbing Code of Canada, and the National Fire Code of Canada are proposed for January 1, 2024[17].

In 2020, the NBC and NECB introduced new tiered energy systems, with five tiers that move toward net zero. Net Zero buildings are defined as buildings that produce as much clean energy as they consume[18]. The Province of Saskatchewan indicated their intent to adopt Tier 2 for energy performance for houses on January 1, 2024, and Tier 3 on January 1, 2025. With respect to commercial and industrial buildings, Tier 1 of the 2020 NECB is proposed to be adopted on January 1, 2024[19]. Consultations are ongoing with stakeholders. It is anticipated that new buildings constructed in Saskatoon may be built to higher energy efficient standards then as early as 2024.

Building as-a-whole retrofits on the existing building stock will be required to achieve energy and water use and emissions reductions as building code improvements will target emissions reductions in new buildings.

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[15] City of Saskatoon Community Facts. Retrieved form: Pleasant Hill.ai (saskatoon.ca), Hudson Bay Park.pdf (saskatoon.ca), King George.ai (saskatoon.ca), and Caswell Hill.ai (saskatoon.ca)
[16] Research was conducted for this report between September 2022 to December 2023.
[17] Government of Saskatchewan. 2020 Code Adoption Workshops. Retrieved on 11/6/2023 from https://www.saskatchewan.ca/business/housing-development-construction-and-property-management/building-and-technical-standards/sign-up-for-a-building-standards-and-licensing-course
[18] Efficiency Canada. Net Zero Energy Ready Buildings in Canada (2023). Retrieved from https://codes4climate.efficiencycanada.org/net-zero-energy-ready-buildings-in-canada/
[19] City of Saskatoon. Current Actions to Support Sustainable Neighbourhood Development Report (2023). Retrieved from https://efaidnbmnnnibpcajpcglclefindmkaj/https://pub-saskatoon.escribemeetings.com/filestream.ashx?DocumentId=197345

3.3 Policies and Programs

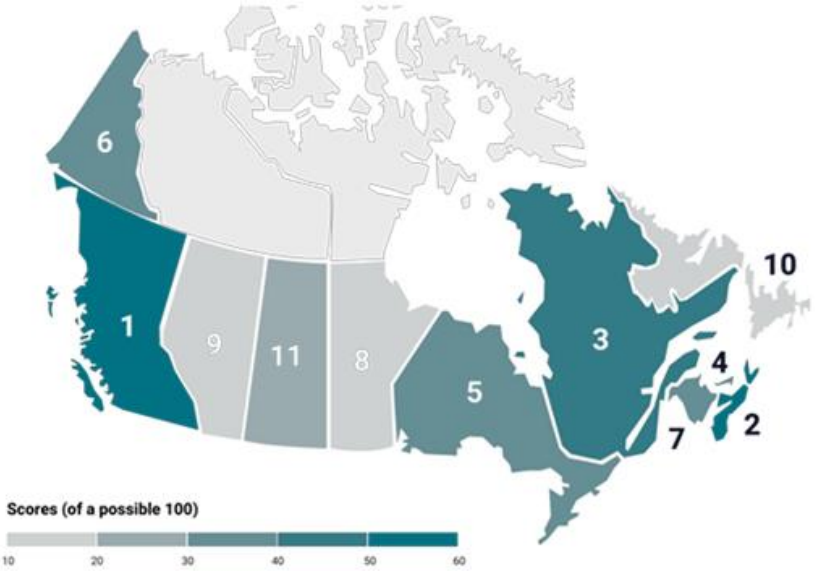


Figure 3 - Energy Efficiency Canada Ranking 2022

In 2022, Efficiency Canada completed a ranking and scorecard analysis for eleven provinces based on energy efficiency policy and programming in 2022.

Overall, Saskatchewan scored 16/100 points and was ranked last out of the eleven. The province has been last or second last for four years in a row[20]. This shows that more is needed in the form of programs and policies to support energy efficiency, renewables, and electric vehicles in the province.

4 Existing Energy and Water Efficiency Programming in the ICI/MURB Building Sector

Energy efficiency and renewable energy programs are offered through varying levels of government and utility providers. This section provides an overview of the existing programs and their limitations, which were available to Saskatoon residents at the time of writing this report.

4.1 Federal Efficiency Policies and Programming

In Canada, the federal government has implemented various programs and initiatives aimed at promoting energy efficiency in ICI buildings, as well as MURBs. The following are some of the key federal programs supporting energy efficiency in these sectors:

[20] Efficiency Canada. 2022 Efficiency Policy and Programming Score Card (2023). Retrieved from https://www.scorecard.efficiencycanada.org/wp-content/uploads/2022/11/SK.pdf

- NRC is responsible for developing energy codes and standards for buildings. These codes establish minimum requirements for energy efficiency in new construction and major renovations. The NRC's energy codes help improve the energy performance of ICI buildings and MURBs across the country and include the following:
    - The NBC sets the minimum standard for building, accessibility and energy standards for houses and small buildings including office/service, retail, and medium and low-hazard industrial.
    - The NECB sets the minimum standard for energy efficiency for medium and large buildings (buildings that exceed 600 m2 or three storeys in height and have major occupancies)[21].
- Natural Resources Canada (NRCan) offers a range of policies and programs focused on enhancing energy that provide technical expertise, tools, and financial incentives to support energy-efficient practices and retrofits. Some key NRCan policies and programs include:
    - Energy Efficiency Regulations: NRCan sets mandatory energy performance standards for various equipment and appliances used in buildings, such as lighting, HVAC systems, and water heaters. These regulations ensure that products meet minimum energy efficiency requirements. These regulations are enacted by the 1992 *Energy Efficiency Act*.
    - Canada Greener Homes: NRCan provides grants and loans to Canadian homeowners including residential and low-rise MURBs (three stories or fewer). Grants of up to $5,000 for qualifying energy efficiency and renewable energy installations, $600 for EnerGuide audit evaluations, and 10-year interest free loans of up to $40,000 are currently being offered to eligible homeowners.
- Canadian Industry Partnership for Energy Conservation (CIPEC) is a partnership between the Government of Canada and Canadian industry. CIPEC promotes innovative energy management to help Canadian industry increase:
    - Profitability,
    - Competitiveness, and
    - Sustainability.

  CIPEC support includes providing financial assistance, organizing meetings and events, benchmarking energy intensity in various sectors, and sharing energy efficiency information resources and tools.

[21] Efficiency Canada. Regulating Energy and Emissions in Existing Buildings: A primer for Canadian Municipalities. Retrieved from Regulating-energy-and-emissions-in-existing-buildings-A-primer-for-Canadian-municipalities.pdf (efficiencycanada.org)

- Canada Mortgage and Housing Corporation (CMHC) provide support for energy-efficient and sustainable construction practices in the residential sector, including MURBs. Their programs include:
    - Green Building Certification: CMHC offers incentives for builders and developers to pursue third-party green building certifications, such as LEED (Leadership in Energy and Environmental Design) or ENERGY STAR. These certifications recognize buildings that meet high standards of energy efficiency and environmental sustainability. Certification programs are discussed further in Section 7.4.
    - Residential Rehabilitation Assistance Program: provides financial assistance to homeowners and property owners for making energy-efficient upgrades to existing residential properties. This includes MURBs seeking energy retrofits.
    - Canada Greener Affordable Housing Program: Canada Greener Affordable Housing helps affordable housing providers complete deep energy retrofits on existing MURBs. Mid- to high-rise, low-rise and multi-plex buildings that are at least 20 years old are eligible to apply under this program.
    - Rental Construction Financing Initiative: Offers low-cost loans to builders to encourage construction of sustainable rental apartment projects across Canada.
- Canada Infrastructure Bank (CIB) invests in revenue generating infrastructure projects that support economic growth. The overall policy direction and high-level investment priorities of the CIB is set by the Canadian Government. The CIB focuses on five sectors: green infrastructure, clean power, public transit, trade and transportation and broadband infrastructure[22]. One such program offered for green infrastructure sector includes:
    - Building Retrofit Initiative (BRI): CIB provides financing under the BRI for energy retrofits projects to public (all levels of government, Indigenous communities, schools, hospitals, universities, etc.) and private sector entities to invest in the decarbonization of buildings. Public sector entities may receive direct investments from the CIB through the BRI initiative for investments over $50M, however, for any investments less than $50M, investments would come from one of CIB's financing aggregators.
    - SOFIAC is an example of a CIB aggregator organization. SOFIAC develops, manages, and invests in major decarbonization and energy retrofit projects for all Canadian businesses in the ICI sector and whose annual energy costs exceed $500,000. In addition to managing all project phases, SOFIAC assumes 100% of the financial and technical risks.

[22] Canada Infrastructure Bank (2023). Retrieved from https://cib-bic.ca/en/investments/

- Additional local examples of projects funded through the BRI program are:
    - Avenue Living Retrofits: CIB invested $130M with Avenue Living to renovate 240 low-rise MURBs throughout the western Canadian provinces. Two of these buildings are currently in the design phase and are located in Saskatoon. Residents in more than 6,400 buildings will benefit from optimized energy performance through mechanical upgrades, window and door replacements, lighting retrofits, low-flow faucets and toilets, roof insulation, rooftop solar. Through these retrofits, building GHGs will be reduced by 30% or more.
    - BMO Retrofits: CIB invested $100M with BMO to finance retrofits for small and medium-sized buildings that do not qualify for direct loans through CIB. Potential candidates must reduce GHG emissions by at least 30% and qualify for certification under the Canada Green Building Council's Investor Ready Energy Efficiency (IREE) or Zero Carbon Building standards (ZCB) (see Section 7.4) to have access to this below market loan.
- Federation of Canadian Municipalities (FCM) Green Municipal Fund (GMF) supports municipalities in implementing innovative projects that promote sustainable development. This fund provides grants and loans to support Canadian municipalities of all sizes to pilot and implement highly innovative and impactful environmental projects that reduce GHG emissions and protect the air, water, or land[23].
    - FCM Signature Initiative Pilot Project is offering grants up to $500,000 to conduct a pilot project.
    - FCM Signature Initiative Capital Project is offering low-interest loans of up to $10 million including grants worth up to 15% of the total loan amount.

Through programs and initiatives offered by organizations such as NRCan, NRC, CMHC, CIB, and FCM, building owners, developers, and municipalities can access valuable resources, technical expertise, and some financial incentives but the programming for the sector is still limited.

4.2 Provincial Efficiency Polices and Programming

The Government of Saskatchewan does not currently offer any programs to support energy and water efficiency in the ICI sector. However, the Crown Corporations SaskPower and SaskEnergy who report to the provincial government through a minister offer programming, which is discussed under Section 4.3 Efficiency Programming – Electric Utilities and Section 4.4 Efficiency Programming - Natural Gas Utilities.

The Construction Codes Act, 2022, is legislation which regulates building construction in Saskatchewan. Currently, as discussed in Section 3.2 – Building Code, Saskatchewan

[23] Federation of Canadian Municipalities. Green Municipal Fund. Pilot Project: Signature Initiative (2023). Retrieved from https://greenmunicipalfund.ca/funding/pilot-project-signature-initiative

adheres to the NRC's NECB, 2017 and the NBC, 2015 as the minimum standard for the construction and renovation of buildings throughout the province.

4.3 Efficiency Programming – Electric Utilities

Saskatoon's electricity is provided by either SaskPower or Saskatoon Light & Power (SL&P) depending on location.

SaskPower is a crown corporation that operates power generation facilities across Saskatchewan and distributes it to residents or sells it for further distribution by utilities like SL&P.

SL&P is a utility operated by the City; they purchase power from SaskPower and distribute it through a system of transmission lines, substations, and distribution lines. Power is delivered to their customers at a variety of voltage levels and configurations.

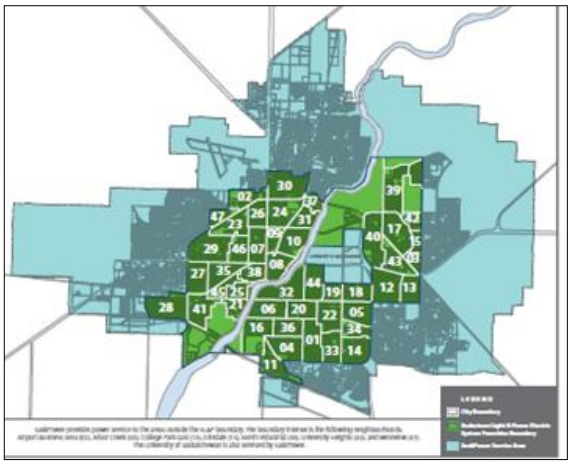


Figure 4 - Saskatoon Light &Power and SaskPower Service Areas in Saskatoon

The average total cost of residential electricity in Saskatchewan based on an average monthly consumption of 1,000 kWh including fixed and variable costs is currently $0.199/kWh, which is higher than the average Canadian cost for electricity which is $0.192/kWh. Saskatchewan has the fourth highest cost in the country following Alberta, Nunavut, and the Northwest Territories, which have average costs of $0.258/kWh, $0.354/kWh, and 0.410/kWh respectively[24].

In Saskatoon, electricity is billed based on fixed and variable costs which include a basic monthly charge, demand charge (kilovolt Amperes (kVA)), energy charge (kilowatt-hour (kWh) consumption), carbon charge and associated taxes. Energy charges are inconsistent for consumers and are based on rates structures. Rate structures are determined by demand, which is the maximum amount of electricity that is required at a single point in time. In Saskatoon, energy charges are typically favorable for buildings with larger demands (~$0.1152/kWh) vs building with smaller demands such as small commercial and residential buildings (~$0.150/kWh)[25].

4.3.1 SaskPower

SaskPower currently provides residential and commercial customers with power savings tips, enabling tools to analyze power use, and programs to promote and incentivize energy efficiency in ICI buildings such as:

- The Net Metering Program: SaskPower offers a net metering program for residential and commercial customers who want to generate up to 100KW's of

[24] Energy Hub.org (2023). Retrieved from https://www.energyhub.org/electricity-prices/
[25] SaskPower. Power Supply Rates (2023). Retrieved from https://www.saskpower.com/Accounts/Power-Rates/Power-Supply-Rates

renewable energy. This program allows customers to generate and consume electricity and 'bank' any excess electricity as a credit to offset future usage, with the use of bi-directional meters. The energy credit issued by SaskPower is $0.075/kWh or about half of the current energy charge for residential or small business (~$0.150/kWh)[26]. This credit rate is expected to remain constant until the end of 2026.

- Since 2020, SaskPower has offered the Energy Assistance Program in partnership with the City so that both SaskPower and SL&P customers would be eligible. The program targets income-qualified customers (both property owners and renters) to provide energy efficiency education and free installation of energy and water saving measures to residential homes. The program is offered to income-qualified[27] renters and homeowners free of charge. The program includes three components:

    1. Home visits that include a full walkthrough and energy coaching conducted by qualified technicians, to identify and explain behaviour changes and potential savings to residents.
    2. A tailored report for each participating home outlining energy savings (note these are not a full EnerGuide audit).
    3. Installation of energy-saving improvements such as LED lighting, power bars, and programmable thermostats; and water-saving measures like faucet aerators and showerheads.

- SaskPower will pay large industrial and commercial customers to reduce or shift their power use through the Demand Response Program. Customers are eligible for the program if they can verify that their facility is able to reduce electrical consumption by five megawatts or more.
- The Power Support Service Program: This program provides services to assist facilities in their efforts to reduce electrical consumption. Eligible facilities must make or processes goods or extracts raw materials. Services include energy review reports, technical assistance, and project study help.

4.3.2 Saskatoon Light & Power

SL&P distributes power generated by SaskPower to residential and commercial customers and sets its utility rates to match those established by SaskPower. SL&P offers two residential and commercial customer-based power generation programs for customers that want to generate up to 100kW of renewable electricity: the Net Metering and Small Power Producer programs.

- Net Metering Program: SL&P's net metering program is similar to that of SaskPower's. However, SL&P's program issues a one-to-one energy credit for the electricity provided by the customer to the grid, meaning that the credit received is equal to the electricity rate for the service.

[26] Ibid. footnote 25
[27] Income qualified households with incomes of $70,000 or less.

- Small Power Producer Program: SL&P's Small Power Producer Program is designed for customers that want to generate their own renewable electricity, while earning money by selling some of the electricity back to the grid. The program allows customers to generate electricity and sell the excess electricity to SL&P at a current rate of $0.1148/ kWh[28]. However, this program is not attractive to customers as rates for the Net Metering Program have typically been more favourable.

4.4 Efficiency Programming – Natural Gas Utilities

4.4.1 SaskEnergy

SaskEnergy is the natural gas distribution company that provides services to the entire province. Natural gas is the primary heating source for buildings and current rates for the resource are cost effective. SaskEnergy has no energy efficiency targets or mandates to reduce energy consumption or GHG emissions at this time. However, they do offer a couple programs targeted to the ICI sector:

- The Commercial Space and Water Heating Rebate Program: This program offers rebates of up to $1,200 to upgrade furnaces, boilers, infrared tube heaters, heat recovery ventilators (HRVs) and water heaters to more efficient models.
- The Commercial Boiler Rebate Program: This program is targeted at large buildings within the ICI sector that have boiler systems over 400MBH in size. Rebates of up to $40,200 (based on the size of the plant) are offered to customers to replace their boiler system with a more efficient model that has a minimal thermal efficiency of 90%.
- The Hydronic Additive Rebate Program: This program offers rebates of up to $200/gallon to building owners that heat their buildings with closed loop boiler systems. By adding a hydronic additive to the boiler system, heat transfer to the building can be improved by reducing the surface tension and ultimately reducing natural gas consumption.

4.5 Efficiency Programming – Water Utilities

4.5.1 Saskatoon Water

The City provides water to Saskatoon and region through its utility, Saskatoon Water. Notable programs currently being offered to the ICI sector include:

- Storm Water Management Credit Program: This program provides a reduction in storm water utility charges to MURBs or non-residential property owners who have implemented storm water quality improvements and pollution prevention, or to owners who have reduced the quantity of storm water leaving their property. Eligible projects include storm water capture for re-use and enhanced vegetated retention areas.
- SmartUtil was recently launched by the City, which is an easy-to-use online tool that helps residential and commercial customers track and monitor water and electricity usage, identify consumption trends down to the hour, keep on budget

[28] Rate retrieved Nov 23

(by letting alerts) and helps customers conserve and reduce their impact on the environment.

- The City also offers Environmental Grants to non-profit organizations to implement initiatives that support the City of Saskatoon's strategic goal of Environmental Leadership. Initiatives prioritized for funding in 2023 include those that:
    - Improve energy and water efficiencies,
    - Increase awareness and protection of water resources,
    - Reduce the amount of waste going to landfills,
    - Provide stewardship, education and/or enhancements to the green network,
    - Encourage active transportation, and
    - Provide learning opportunities that support the City's environmental goals.

Currently, The *Water Conservation Strategy, 2022* has prioritized civic water conservation, particularly park irrigation as it accounts for over half of the water used by the City in facilities and operations, based on community feedback to see the City lead by example. However, the *Water Conservation Strategy* proposes 13 ICI/MURB building sector initiatives to meet the targets set forth in the LEC Plan including incentives for replacing fixtures and performing audits. The proposed initiatives include:

- Affordable Housing Energy & Water Conservation Pilot,
- Water Conservation Using AMI Data and Dashboard,
- Affordable and Multi-Family Housing Water Conservation Incentives & Education,
- Water pricing & Rate Structure Review,
- Grey-Water Strategy,
- Water Conservation Environmental Grant (non-profit specific),
- ICI Building Energy Retrofit Program,
- ICI Water-Use Education Program,
- ICI Audit and Fixture Incentive Program,
- ICI Capacity Buyback Program, and
- ICI Once-Through Cooling Replacement Incentive Program,
- ICI irrigation system upgrade rebate program, and,
- ICI irrigation system assessments, training, and accreditation.

4.6 Efficiency Programming – Other

4.6.1 Saskatchewan Environmental Society (SES)

The SES is a local not for profit organization that works towards environmental sustainability through public education, policy development, and community events[29]. One program offered for the ICI sector includes:

- Building Operator Training (BOT) – The BOT program introduces custodians, building operators, facility managers, financial managers and others to energy and water conservation principles, new energy and water efficient technologies, and facility retrofits that will save energy and money.

5 Public Engagement Results

From May to October 2023, the City engaged with the ICI sector in the development of the ICI Building Energy and Water Retrofit Program. A total of 111 participants from the ICI building sector took part in various engagement activities, including representatives from the construction, food service, hospitality, property management, business, real estate, and financial industries. More detailed engagement information and results are provided in Appendix B - Final Engagement Report. Through stakeholder meetings and surveys, we received feedback on numerous aspects of the program, including:

- How can the City support energy retrofitting efforts within the ICI building sector?
- What are the opportunities and barriers for completing energy retrofits?
- What is the level of interest in participating in the proposed program options?

5.1 Interest in Energy Efficiency Retrofits

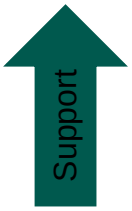
Through the engagement process we heard that making energy efficiency improvements and/or greenhouse gas (GHG) emissions reductions to their business/organization is either very (57% of participants) or somewhat (30%) important to participants. When asked to prioritize the reasons for why making energy efficiency improvements was important, participants provided the following ranking:

1. Cost reduction and saving money
2. Saving energy, water, and resources
3. Protecting the environment
4. Reducing our impacts and GHG emissions
5. Important for sustainable communities and future generations

On average, participants want to decrease the energy use of their building through energy efficiency improvements by 10% to 30%, with many participants indicating that they had already made (54%) or were planning to make energy efficiency improvements

[29] Saskatchewan Environmental Society. Our Story (2023). Retrieved from https://environmentalsociety.ca/about/story/

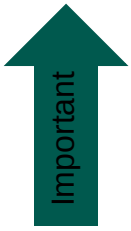
(14%). Out of the numerous retrofits provided, participants were primarily interested in the following improvements:



1. Windows and doors
2. Solar panels
3. Lighting
4. Automation controls and programmable thermostats
5. Heat, ventilation and/or air conditioning systems

5.2 Barriers to Energy Efficiency Retrofits

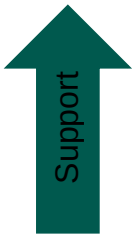
Although there is an interest within the ICI community to make energy efficient improvements and GHG emissions reductions, there are barriers to implementing such improvements to their building or operations. Participants prioritized the following barriers as being the most important:



1. Costs are too high and return on investment is too low
2. Incentives, grants, or rebates are not available
3. Difficulty implementing energy efficiency improvements
4. Unaware of where to start, what is available or the costs
5. Unaware of the benefits of energy efficiency improvements

5.3 Program Instruments

When asked to prioritize the proposed instruments for the program, participants provided the following ranking:



1. Rebates (30% or more of the total project cost)
2. Energy audits
3. Energy benchmarking
4. Decision support tools
5. Capacity building opportunities
6. Loans/financing

Although financing in the form of loans was not as favoured by all participants, those involved in the energy efficiency sector felt that they would be of greater benefit to small businesses and organizations, those who could not receive funding and/or those who did not already have corporate GHG mandates to fulfill.

When asked what size of loan participants would be interested in obtaining to complete energy efficiency improvements to their buildings 49% of participants indicated $100,000 or less, in part due to the current interest rates being high. However, 20% indicated that they would be interested in loan between $100,000-$700,000. Also, participants indicated they would be interested in receiving a loan from the City over a financial institution if the City provided lower interest rates, greater flexibility on loan terms (ex. no penalty for early payback, multiple options for term length, etc.) and a simple application process.

Suggestions for other program options to consider included energy efficiency coaching and providing greater incentives/support to those businesses/organizations that are in greater need.

5.4 Education and Awareness

When asked what information they felt would increase awareness and participation in the program, participants identified that providing the upfront costs and return on investment for the various types of retrofits, examples of energy efficiency retrofits for buildings of similar sizes and educational information about the program would be most important.

Participants strongly supported providing online tools (ex. Decision making tools, checklists, savings calculators, etc.), website information, and delivering information through utility bills. Participants also called for more personal assistance in working through the application process and in identifying what retrofits may work best for their building. Some participants stressed the importance of success stories from other businesses who implemented energy efficiency retrofits, since many would be unaware of how to begin.

5.5 Other Comments

From the various comments provided throughout the engagement activities the following topics were emphasized by participants:

Costs: Many participants expressed that although emissions reductions and energy efficiency improvements are important, the associated costs of the program and return on investment of any improvements need to be emphasized.

Flexibility: Program options, applications and the administrative process need to be flexible enough to allow for a variety of applications, since there will not be a standard approach for all buildings.

Simple: Making the program and options simple to understand, apply for and implement is critical.

Support: Many participants supported the program options and the City's efforts towards improving energy efficiency across Saskatoon.

6 Barriers to Energy Efficiency in the ICI/MURB Sector

As shown through the ICI Engagement results presented in Section 5, the ICI sector in Saskatoon finds energy and water efficiency improvements important but faces barriers that hinder its ability to adopt them. Some are directly related to financing; however, others go beyond financing. The key barriers described below were identified based on

reports from the Canada Green Building Council[30], Efficiency Canada[31], Energy and Mines Ministers[32], City of Ottawa[33] and the Delphi Group[34] and were built on through public engagement (Section 5) including the ICI survey and consultations with stakeholders. The barriers include:

- Energy and water efficiency retrofits can have high upfront costs, low return on investments, long payback periods, extended retrofit timelines, and operational complexities that can inhibit business's ability to invest,
- Business and building owners may lack motivation due to the complexity of the renovation process,
- Business and building owners may not have access to capital or may have limits on debt levels,
- The building sector typically obtains financing through financial institutions or investors that may have stringent credit requirements, complex processes, provide unfavorable terms and do not provide tailored options for financing energy efficiency projects,
- Landlord-renter split incentives: Utility savings associated with a building retrofit may not go to the entity responsible for making the capital investment decision. This can make it challenging for building owners to invest capital if they are not benefiting from the savings,
- Based on the review of existing programs in Saskatchewan, there are no financing or financial-incentive programs that facilitate full building as a whole retrofits, and instead offer a piece-meal approach with rebates only for specific equipment replacements such as HVAC upgrades,
- A lack of awareness and knowledge regarding which energy-efficient technologies are available and the ability to assess the feasibility of energy-efficient projects including evaluating which ones make the most financial sense,
- Building owners may lack confidence in energy and water efficiency project performance and data validity, and
- Shortage of qualified people in the ICI sector, such as energy auditors and energy retrofit contractors, project advisors and managers.

[30] Canada Green Building Council. Decarbonizing Canda's Large Buildings: A Path Forward (2022). Retrieved from https://www.cagbc.org/wp-content/uploads/2022/04/Decarbonizing-Canadas-Large-Buildings-Report-w.-Appendices-Final-Revised-Copy_with-formtting_2022-04-25.pdf
[31] Ibid. footnote 21
[32] Energy and Mines Ministers' Conference. Financing Energy Efficiency Retrofits in the Built Environment (2016) Retrieved form https://natural-resources.canada.ca/sites/www.nrcan.gc.ca/files/emmc/pdf/Financing%20Report-acc_en.pdf
[33] Better Buildings Ottawa. City of Ottawa's Strategy for Accelerating Retrofits of Existing Industrial, Commercial, Institutional, and Multi-Unit Residential Buildings (2021). Retrieved from https://pub-ottawa.escribemeetings.com/filestream.ashx?documentid=80428
[34] Delphi Group. Green Retrofit Economy Study (2022). Retrieved from https://delphi.ca/wp-content/uploads/2022/10/Technical-Memo-Demand-side-Analysis.pdf

7 Program Instruments

Many municipalities, provinces, and utility providers throughout Canada offer energy and water efficiency programming that incentivize decarbonization efforts. Best practices and program instruments were identified through online research, literature review, and interviews with municipal staff. The interviews were conducted with Calgary, Edmonton, Winnipeg, Toronto, and Vancouver as they currently offer ICI building energy and water efficiency programming.

Municipal programs were reviewed through online research and interviews were conducted with municipal Program Managers to identify the best practices or instruments that make up the programs, the criteria required to participate, program terms and interest rates, program barriers, and the justification for the program. Table 3 provides an overview of the types of efficiency instruments currently being offered. While some of these are provided by the municipality, many are provided by other entities such as local utilities, non-profit groups, and provincial governments.

Table 3 - Energy and Water Efficiency Program Instruments in Other Cities

Program Instruments	Vancouver	Surrey	Edmonton	Calgary	Winnipeg	Ottawa	Kingston	Toronto	Halifax	Montreal	Cities with Program Instruments (%)
Financing											50%
Financial Incentives											70%
Benchmarking, Labeling, and Disclosure (BLD)											100%
Mandatory Energy Use Data Disclosure Regulations											50%
Capacity Building, Networking and Education											70%

Municipality led

Led by entities other than municipalities (Utility providers, Crown corporations, and other 3rd party entities)

The table above provides current examples of municipal efficiency programming instruments. Programming based on bylaws and code regulations on energy and water efficiency have also been implemented mostly at a provincial level and have not been

discussed in detail within this report. However, in the future, once the program instruments discussed within the report have been successfully demonstrated and energy efficiency has been realized, it may be required to mandate efficiency regulations to ensure the widespread adoption of efficiency throughout ICI/MURB building sector.

This section provides a discussion on the program instruments including a detailed description, municipal best practice examples, and a cost and benefit analysis.

7.1 Property Assessed Clean Energy (PACE) Financing

Municipal financing is most commonly offered through a Property Assessed Clean Energy (PACE) mechanism. However, other types of lending mechanisms are also utilized throughout Canada to support energy efficiency retrofits outside of the municipalities' involvement, these are not explored in this study. There is an additional model where a municipality partners with a financial institution to offer financing directly to building owners, since this model is currently not widely used in Canada for the ICI building sector, it is also not explored through this report[35].

PACE is a financing mechanism in which building owners borrow money from the municipality to implement energy and water efficiency, renewable energy, or other projects and make repayments through their property taxes. The financing arrangement then remains with the property even if it is sold, facilitating long-term investments in building performance[36].

There are two types of PACE programs that serve two diverse markets: Residential PACE (R-PACE) and Commercial PACE (C-PACE).

R-PACE programming is targeted specifically to the homeowner and is being used successfully across Canada for single-family residential buildings (detached, semi-detached and row housing) including through Saskatoon's HELP. The approval process for R-PACE is typically a quick process that involves confirmation of the property's ownership, and a tax history assessment[37].

C-PACE is targeted to all other non-R-PACE property owners including:

- Offices,
- MURBs[38],

[35] Dunsky. Dunsky Supporting Halifax in Exploring Financing Options to Scale Clean Energy Upgrades for Homes and Businesses (2023). Retrieved from https://www.dunsky.com/dunsky-supporting-halifax-in-exploring-financing-options-to-scale-clean-energy-upgrades-for-homes-and-businesses/
[36] U.S Department of Energy. Property Assessed Clean Energy Programs (2023). Retrieved from https://www.energy.gov/scep/slsc/property-assessed-clean-energy-programs#:~:text=The%20property%20assessed%20clean%20energy,PACE%20or%20C%2DPACE)
[37] Canadian Home Builders Association. Keys to Developing a Successful PACE Financing Program (2023). Retrieved from https://www.chba.ca/CHBA/Housing_in_Canada/Net_Zero_Energy_Program/PACE.aspx
[38]Multi-family estates with five units or more are considered a commercial asset. Retrieved from https://www.nbc.ca/personal/advice/home/multi-family-real-estate.html

- Hotels,
- Industrial buildings,
- Institutional,
- Retail, and,
- Other buildings that fall under the definition of a commercial property.

C-PACE programs are not as widely adopted throughout Canada as R-PACE programs. The approval process for C-PACE can be significantly more involved and can include front end costs to cover energy modelling, business case analysis, and mortgage lender approval, which are not typically required during the R-PACE approval process[39].

While C-PACE programming has not yet been widely adopted throughout Canada, it has been extensively adopted throughout the United States (U.S.). C-PACE programs are currently being offered in 30 States plus the District of Columbia[40]. Existing U.S. C-PACE programs vary across several dimensions including the level of organization (statewide vs. local programs), financing structures, and eligible measures[41].

While C-PACE is most commonly used to finance retrofit projects in existing buildings, owners and developers are increasingly incorporating C-PACE into the capital stack to finance new building construction. C-PACE is currently being used for new construction in 19 states[42]. Lender consent and stringent performance and efficiency requirements are often required to employ C-PACE as a funding mechanism for the new builds[43]. This mechanism has not yet been implemented in Canadian municipalities; therefore, it will not be discussed in detail within this report.

Compared to R-PACE, C-PACE programs can produce larger savings on utility costs and emissions reductions with fewer projects for program administrators but have shown to be more complex, require longer construction periods, and require larger total financing volumes. For example, in 2021, the average project cost for a commercial PACE project in Toronto was identified to be $735,000 compared to $22,000 for a residential project; the average completion timeline is 15–17 months per commercial project compared to 4-6 month per residential project[44].

PACE financing programs can enable building owners to make energy upgrades by leveraging their property's value and offering accessible and flexible financing options.

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[39] Ibid. footnote 37
[40] PACENation. PACE Programs (2024). Retrieved from https://www.pacenation.org/pace-programs/
[41] U.S. Department of Energy. Property Assessed Clean Energy Programs (2024). Retrieved from https://www.energy.gov/scep/slsc/property-assessed-clean-energy-programs
[42] Rocky Mountain Institute. FAQ: PACE For Homes. (2024). Retrieved from https://rmi.org/our-work/buildings/residential-energy-performance/faq-pace-for-homes/
[43] U.S. Department of energy. Better Buildings. Commercial PACE Financing for New Construction. (2024). Retrieved from CPACE_for_New_Construction_Fact_Sheet_FINAL.pdf (energy.gov)
[44] Clean Air Partnership. Accelerating Home Energy Efficiency Retrofits through Local Improvement Charge Programs: A Toolkit for Municipalities. (2020). Retrieved from https://www.cleanairpartnership.org/wp-content/uploads/2020/05/FINAL-LIC-TOOLKIT-Accelerating-Home-Energy-Efficiency-Retrofits-Through-LIC-Programs-2020-1.pdf

7.1.1 Municipal Best Practices

Three C-PACE financing programs have been offered by Canadian municipalities to date, and a fourth program is expected to launch in 2024[45]. These include:

7.1.1.1 Commercial Clean Energy Improvement Program

The City of Edmonton's Commercial Clean Energy Improvement Program (CEIP), a 2-year pilot program that launched in June 2021, now closed to new applications, but plans to re-launch with program enhancements in June 2024. Edmonton's CEIP provides commercial, industrial, special purpose, and farm land property owners financing for energy and renewable energy upgrades which is repaid via their municipal property taxes. MURBs were not eligible for the municipal pilot program as MURBs are considered "residential" under the CEIP provincial program and will be eligible for financing under that program[46]. Eligible upgrades include Solar PV installations, air source heat pumps, HVAC, interior and exterior LED lighting and controls, and other upgrades that increase the energy efficiency or use of renewable energy.

The 2-year program offered financing of $3,000 up to $1 million (M) per building. Participants were required to make a minimum of 3 eligible upgrades, have 5 years with no arrears on their property tax account, have owned the property for a minimum of 5 years, participate in both the City's Building Energy Benchmarking and Building Energy Retrofit Accelerator (BERA) programs (Sections 7.2 and 7.3 discuss these programs in detail), and complete an ASHRAE level II audit. Completion of a feasibility study was also required for any renewable energy upgrades. As per the CEIP provincial regulation, the maximum financing amount available to participants was limited by the lesser of the maximum of $1M per property or the property's annual municipal property tax amount (excluding interest and administration fees), as the annual CEIP tax could not exceed the annual property tax amount.

The program offered fixed terms for up to 20 years with an interest rate of 3.16% for a 20-year term and any earned rebates from the BERA program were used to reduce financing totals[47]. Funding was provided by FCM, and up to $10M was available for an estimated 20 commercial buildings. The program was created by the Government of Alberta via An Act to Enable Clean Energy Improvements and is administered by Alberta Municipalities through the Alberta CEIP Program.

An interview with the municipal program manager identified that the program received eight applications during the two-year pilot program. Four applications were denied due to eligibility requirements, one project is complete and achieved net-zero, and three projects are currently in process. The average loan amount requested was identified to be ~$750,000/building and administration fees charged to each participant were 1.5% incl of the total approved loan amount.

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[45] The City of Calgary expects to launch a C-PACE program in 2024.
[46] Program Manager CEIP, City of Edmonton, Teams Interview, (2023, December 12).
[47] Ibid. footnote 46

Uptake barriers identified include limited marketing and understanding of the program and short project timelines. For example, implementing three energy efficiency upgrades within a year can be challenging for building owners and their contractors. A multi-year program is expected to re-launch in June 2024, with an extensive marketing strategy and energy coaching services (to be provided by Alberta Ecotrust). It is expected that the program will be available for up to 20 buildings. A minimum of three retrofits will be required unless the building owner is returning to program (can do one upgrade at a time) or if fewer than three upgrades are required to reach Net Zero Energy or Net Zero Emissions. First reading of the new bylaw to create the multi-year CEIProgram is scheduled for February 12, 2024.

7.1.1.2 High-Rise Retrofit Improvement Support Program

The City of Toronto's High-Rise Retrofit Improvement Support Program (Hi-RIS) launched January 2014. Hi-RIS is designed for rental apartment buildings of three storeys or more and offers financing of up to 10% of the buildings assessed value or a maximum of $2.5M per building with current interest rates between 4.49% for a fixed five-year term up to 4.97% for a fixed 20-year term[48]. The program offers free support and decision-making services (see STEP Program in Section 7.4.1 for further details), and assistance with accessing additional incentives and rebates from third-party utility entities. Property owners must be in good standing with the City over the past 5 years, participation in the STEP program and conducting an energy assessment is required to participate in the program. Eligible building improvements include building envelope (windows and doors, air sealing, insulation), mechanical systems (boilers, building automation systems (BAS), heat pumps, cooling systems, HRVs), low-flow toilets and faucets, renewable energy, and lighting retrofits.

An interview with the municipal program manager identified that about 15 MURBs have completed building retrofits through the program. The program has a revolving fund where $10M was allocated to the program ~10 years ago and the fund has about ~$5M to use for additional retrofits at this time. Administration fees of 0.8% of the total approved loan amount are charged to participants to offset the cost to operate the program. No defaults on loan repayments have occurred.

Uptake barriers identified include current cost of borrowing (high prime interest rates) which are hindering the communities trust in borrowing at this time, literacy and understanding of energy and water efficiency retrofits throughout the community, and the lack of offering a pre-vetted contractor list through the program.

7.1.1.3 Taking Action on Tower Renewal Program

The City of Toronto's Taking Action on Tower Renewal Program (TATR) program launched in the summer of 2023. This FCM funded program, is designed for MURBs built prior to 1990 and have three storeys or more. Eligibility requirements include that the MURB must be located within the City of Toronto in a Neighbourhood Improvement

[48] Program Manager Tower Renewal, City of Toronto, Teams Interview, (2023, November 23). Rates are updated quarterly and are current as of November 23, 2023.

Area or in a community where residents live on low incomes based on census data. Property owners are eligible for financing of up to 25% of the buildings assessed value or a maximum of $5 million per building with current interest rates of between 4.49% for a fixed five-year term up to 4.97% for a fixed 20-year term[49]. After a year of the retrofits being complete, upon verification through an energy audit, the property owner is eligible for 10% of the total loan amount to be converted into a non repayable grant if an energy efficiency reduction of 30% or more has been achieved of for up to 7.5% of the total loan if an energy efficiency reduction of 15% was achieved.

Similar to the Hi-RIS program, the program also offers support through the City's STEP program (see Section 7.4.1.). Property owners must also be in good standing with the City over the past 5 years, and participation in the STEP program and completing an energy assessment is required. Eligible building improvements include building envelope (including roof replacements), high efficiency windows, heat pumps, mechanical systems, water fixture upgrades, and LED lighting.

As part of the financing agreement with FCM, the municipality ensures tenants are protected from displacement and rent increases, and that information sessions and clear communication is provided to tenants over the duration of the building retrofit[50].

An interview with the municipal program manager identified that 10 expressions of interest have been received since launch of program and that no retrofits had been completed as of November 2023. Administration fees are the same as the Hi-RIS program where 0.8% of the total approved loan amount is charged to program participants to offset the cost to operate the program.

Uptake barriers identified include restrictive eligibility criteria (currently based on physical locations within City) and a lack of capability for owners to increase rents upon completion of the retrofits (landlord-renter split incentive gap).

Another municipal financing program not using the PACE financing structure, includes:

7.1.1.4 Energy Retrofit Loans Program

In 2019, the City of Toronto Council expanded the eligibility for the Sustainable Energy Plan Financing to include private sector and enable low carbon retrofits that require City funding. The new program called Energy Retrofit Loans offers non-PACE loans to all ICI buildings throughout the City including MURBs. The program can provide up to 100% of the total project cost and up to 30-year repayment terms at rates that are equal to the City's cost of borrowing. The amount of financing and term of the loan are determined by a business case assessment. Current interest rates between 4.40% for a fixed five-year term up to 5.09% for a fixed 20-year term[51]. Three years of audited financial documents, a detailed project summary, which includes estimated costs and savings, and a feasibility or engineering study are required to participate in the program. Eligible

[49] Ibid. footnote 48
[50] City of Toronto. (2023). Retrieved from https://www.toronto.ca/news/city-of-toronto-launches-new-energy-retrofit-financing-and-grant-program-for-older-apartment-buildings/
[51] Program Manager Energy Retrofit Loans Program, City of Toronto, Teams Interview, (2023, November 11). Rates are updated quarterly and are current as of November 23, 2023.

projects may be offered through unsecured loans and up to a year interest- and payment-free financing options. Eligible projects include heat pumps, boilers, chillers, HVAC, BAS, lighting retrofits, renewable energy systems, and other measures/technologies. The program does not charge administration fees and has not realized any repayment defaults.

An interview with the municipal Program Manager identified that the program receives about 10+ participant applications per year and that approximately 2 building retrofits are funded per year (~22 retrofits since program launch). Applicants are typically larger buildings/business, as the requirement for audited financial statements is a barrier for small and medium sized enterprises to participate. Typical loan size is approximately $1-2M, however the program has supported a range of projects from $60,000- $8.3M

7.1.1.5 Summary of Municipal Financing Programs

The existing municipal C-PACE programs throughout Canada are in the beginning stages therefore there are limited programs to benchmark. Program financing structures and eligibility criteria vary significantly throughout the four programs identified within this report.

The existing municipal financing programs are considered to be successful and continue to be offered to property owners to perform energy and water efficiency retrofits in their respective communities. However, program barriers have been identified and include:

- Limited program marketing,
- Limited community understanding of the program and the benefits associated with building efficiency retrofits,
- Short project timelines,
- Equity considerations limited to physical areas of the city,
- Extensive credit check requirements,
- Landlord-renter split incentives,
- High cost of borrowing, and
- Lack of the use of a pre-vetted contractor list.

The barriers and lessons learned have been taken into consideration and incorporated into the ICI pilot programs discussed in Section 8. Table 4 provides a summary of the administration fees, interest rates, terms offered, total maximum loan amounts and program uptake, available through existing municipal financing programs available in Canada.

Table 4 - Summary of Financing Structure for Existing Municipal Financing Programs in Canada

Program	Administration Fees	2023 Interest Rates	Term	Maximum Loan Amount Per Building	Program Uptake
Clean Energy Improvement Program (Edmonton)	1.5% of the total loan amount. ($15K on a $1M loan)	Varies based on current bond yields. Maximum 9%. 20 years = 3.16%	Up to 20 years	≤ $1M	~8 total applications. 4 denied, 1 completed (net-zero) & 3 in process
Hi-RIS (Toronto)	0.8% of the total loan amount ($16K on a $2.5M loan)	5 years = 4.49% 10 years = 4.64% 15 years = 4.95% 20 years = 4.97%	5 - 20 years	≤ $2.5M	~15 completed building retrofits since program launch
TATR (Toronto)	0.8% of the total loan amount ($12.8K on a $2M loan)	5 years = 4.49% 10 years = 4.64% 15 years = 4.95% 20 years = 4.97%	5 - 20 years	≤ $5M	~10 total applications. No retrofits completed as of November 2023
Energy Retrofit Loans (Toronto)	None	5 years = 4.40% 10 years = 4.60% 20 years = 5.24% 30 years = 5.09%	Up to 30 years	≤ 100% of project cost. No maximum loan amount specified in program documentation.	~10 applications per year. ~22 retrofits completed since program launch

7.1.2 Program Considerations

This section goes through some of the key considerations for a municipal C-PACE financing program, which include loan capital and average/maximum loan amounts, interest rates, interest rate riders, operating costs and administration fees, loan terms and risk of default, target audience and subsidization, and eligible retrofits and mandatory program requirements.

7.1.2.1 Loan Capital and Average/Maximum Loan Amount per Building

Loan capital is the total amount of capital available to loan to participants to cover a portion of the cost of the retrofits. The total loan capital needed is the estimated average loan amount per building multiplied by the targeted number of buildings.

The cost to retrofit an ICI/MURB building can vary widely, depending on several factors such as the size and age of the building, the specific upgrades being made, and the location of the building.

A study from the Pembina Institute published in 2021, suggests that the incremental capital cost (ICC)[52] associated with a typical deep retrofit can range from $75 to $275 per square meter[53] and that applying a cost of $200 per square meter is a plausible ICC for building retrofits[54]. Another study published in 2022, by the CaGBC suggests that the ICC for deep energy retrofits can range from $210 to $1,060 per square meter and that the largest capital cost for most building types is associated with mechanical upgrades. The study suggests that HVAC upgrades can represent 75% to 90% of the total ICC needed for MURB and office buildings retrofits[55]. NRCan defines a deep energy retrofit as an extensive overhaul of a building's systems that can save up to 60 percent in energy costs[56].

The Pembina Institute study also suggests that there is a need to subsidize measures above the business as usual or base replacements with subsidies of 50% to 75% of the total ICC needed to retrofit a building, which will help:

- Avoid replacing failing equipment with upgrades that meet minimum performance standards but are inefficient and non-resilient technologies,
- Support the growth of supply chains and the skilled labour force, and
- Reduce inequity and support the reduction of energy poverty.

To determine the estimated average loan amount of $450,000 per building, the project team assumed:

- A conservative estimate of $150 per square meter, to cover a portion of ICC associated with a building efficiency retrofit.
- The City of Edmonton's Building Energy Benchmarking Program Dashboard – Year 6 Report, where the average MURB building size was identified as being 3000 square meters[57].

While a loan of $450,000 will not support business as usual or base upgrades/replacements, it is anticipated to provide building owners with a portion of the ICC required to retrofit a building, make energy, and water efficiency improvements[58].

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[52] The incremental capital cost (ICC) is the estimated additional capital investment required for retrofit measures above the business-as-usual or base upgrades/replacements required over time.
[53] This range was based on incremental cost data collected from nine case studies in Canada (primarily B.C.) and various locations in the U.S.
[54] Pembina Institute. Canada's Renovation Wave (2021). Retrieved from https://www.pembina.org/reports/canadas-renovation-wave.pdf
[55] Ibid. footnote 30
[56] Natural Resources Canada. Retrofitting (2023). Retrieved from https://natural-resources.canada.ca/energy-efficiency/buildings/existing-buildings/retrofitting/20707
[57] City of Edmonton. Building Energy Benchmarking Program Dashboard – Year 6 Report (2022). Retrieved from https://app.powerbi.com/view?r=eyJrIjoiNTlmMTFlZjUtMGFiOS00ODViLTk0ZDItYzJjNjkxYzRjOTQzIiwidCI6ImNkZjUyNWY5LWQ1MDItNDgzZi1hMWU4LTQ5NjRlMjkwZTY1MSJ9&pageName=ReportSectionc01c61f8e255005777d0
[58] The ICC for the deep retrofit of a 3000 square meter building can range up to over $3,000,000 based the Canada Green Building Council. Decarbonizing Canda's Large Buildings: A Path Forward report.

This funding can be used in addition to internal funding or to leverage or stack existing programs.

Existing C-PACE programs offer large maximum loan amounts ranging from $1M to $5M (Section 7.1.1 provides a detailed discussion on the existing programs and their financing structures). The eligible maximum loan amount will be confirmed during final program design to reduce program uptake risk and to provide a significant source of funding to complete building efficiency upgrades.

7.1.2.2 Interest Rates

Interest rates can be set based on the prime rate, the City's cost of borrowing, or other factors. As per Table 4 above, the interest rates offered through existing C-PACE programs vary in the range of 4.4-9%. Typically, for PACE financing, the City would recover the full interest cost from the program participants.

If the City accessed an internal loan, the interest rate would be based on what the City would receive if the principal were instead invested in the market for the same period, currently 4.3% for a 5-year term, 4.5% for a 10-year term, and 5% for a 20-year term[59]. Saskatoon's annual HELP interest rates are set as such. If an external loan was accessed, the interest paid would be set by the financial institution. Energy and water efficiency improvements are offered through building improvement loans by financial institutions and rates are also based on the current prime lending rates[60]. For analysis purposes, an interest rate of 6% is assumed for borrowing and lending, linked to the prime rates[61] at the time this report was written.

Rates may be set below market value to align with the goals of the program such as promotion of energy efficiency or improving equity. Some residential energy efficiency PACE loan programs have reduced rates as low as 0% (e.g., PACE Atlantic[62]) as does the Canada Greener Homes Initiative[63]. The reduced interest rates are promotional rates, which are typically offered through a combination of low-cost capital or grants.

7.1.2.3 Interest Rate Riders

By adding an interest rate rider on top of the City's borrowing rate for the loans, surplus can be generated and used to enhance or scale the program. The interest rate rider would be the difference between the rate at which the City borrows and the rate at which it lends. City's borrowing is expected to be at a lower rate because the City has a AAA credit rating. On the other hand, the lending rates to the buildings will be determined by the market rate adjusted for lending risks.

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[59] Data retrieved from City of Saskatoon Finance Department Sept 19th, 2023.
[60] Royal Bank of Canada. Home Improvement Loans (2023). Retrieved from https://www.rbcroyalbank.com/personal-loans/home-improvement-loans.html#green and Scotia Bank. Renovations. Retrieved from https://www.scotiabank.com/ca/en/personal/mortgages/home-renovation.html
[61] Rate Hub. Prime Rate in Canada (2023). Retrieved from https://www.ratehub.ca/prime-rate
[62] Energy Hub. Clean Energy Financing Programs Canada (2023). Retrieved from https://www.energyhub.org/solar-incentives/#:~:text=PACE%20Atlantic%20%E2%80%93%20PEI%20residents%20in,15%25%20of%20the%20property%20value.
[63] Government of Canada. Canada Greener Homes Loan (2023). Retrieved from: https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/canada-greener-homes-loan/24286

Research has revealed that other jurisdictions often apply interest rate riders, in addition to administrative charges, to help cover their operating costs. For example, Dunsky Clean Energy Improvement Program Business Case Model developed for the City of Edmonton refers to Sonoma County adding an interest rate rider of 4%; Halifax of 1.21%; and Connecticut Green Bank of between 1% and 3% depending on the size of the loan[64].

Although an addition of an interest rider may cover the operating cost and enhancements to the program, the addition of an interest rate rider may further impact the uptake of the program if interest rates are higher than the cost of external borrowing.

7.1.2.4 Operating Costs and Administration Fees

Operating costs include staff salaries, communications and marketing plans, legal and compliance fees, and technology infrastructure to process applications, assessments, monitoring, and reporting. For this analysis, it is assumed that the loans are administered by the City. Based on experience administering HELP, and assuming slightly more complexity for ICI/MURB buildings, it will take 1 staff coordinator to process a maximum of 100 applications.

For smaller-scale projects, the operating costs tend to be proportionally higher, which can result in increased administration fees. For instance, there would be fixed costs associated with the program whether it involved 15 buildings or 100 buildings. This could be as much as a full-time-equivalent (FTE) staff. Therefore, administration fees may need to be higher to achieve a break-even point in projects with small scale.

The City can recover the operating costs of the program by charging an administration fee, through an interest rate rider, or as a flat fee. When conducting the municipal scan on the existing C-PACE municipal programs, it was identified that the existing C-PACE programs charge a one-time administration fee ranging from 0.8% to 1.5% of the total loan. Discussions with C-PACE Program Managers did not identify administration fees as being a barrier to participating in the existing programs. A maximum administration fee of 1.5%-2% of the final loan amount of $450,000 per building would cost participants $6,750-$9,000 per building and would recover the operating cost of the program over the term of the loan. If subsidization or incentives were designed into the program, administration fees could be waived or reduced for affordable housing[65] or income-qualified participants.

7.1.2.5 Loan Terms and Risk of Default

PACE loan programs typically offer flexible terms from 5 to 30 years based on building owner preference. However, Saskatoon's HELP provides loan terms of 5,10, or 20 years; a maximum of 20 years is preferred by the City's Finance Department.

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[64] Ibid. footnote 35

[65] Affordable Housing MURBs for the purpose of this program would be defined as MURBs that offer rents at or below 80% of the local median market rent to at least 30% of the units within the building. This definition is based on FCM's affordable housing definition for the Sustainable Affordable Housing funding. Retrieved from https://greenmunicipalfund.ca/sustainable-affordable-housing

Risks are also associated with loaning money to community members. However, based on previous research during HELP design, R-PACE loans were found to have less than a 1% default rate. Additionally, interviews with municipal C-PACE Program Managers identified that current C-PACE programs have 0% default rate. However, to mitigate such risks, a property tax lien will be applied to the property upon approval of the application prior to commencing retrofits. Penalties associated with late payments can also help mitigate repayment risks. These will be further investigated and included in the design of the pilot programs.

7.1.2.6 Target Audience and Subsidization

Programs can be targeted at the full sector, or to a segment to enhance affordability and equity.

For example, targeting the MURBs subsector could benefit multiple residents by potentially reducing energy poverty through the reduction of the cost of utilities, while at the same time increasing occupant comfort, safety and building resilience. Section 3.1 provides a detailed discussion on Saskatoon energy poverty rates by neighborhood. Additionally, MURB building owners, property managers, and tenants, face greater complexities in implementing energy retrofits due to shared infrastructure, diverse ownership, and the landlord-renter split incentive gap.

MURB buildings also offer an enormous potential to scale up due to the ease of replication in other similar ICI/MURB buildings. For instance, a high-rise residential building with mixed-use features may have common architectural design and energy consumption patterns with commercial buildings like hotels or offices.

Additionally, targeting small and medium-sized buildings (up to 3,000 sq m) and the non-profit subsector would target up to 95% of the total ICI/MURB building stock in Saskatoon. Small and medium-sized buildings were identified by administration to account for more than 40% of the energy consumption within the ICI sector. The total building stock and the calculated GHG emissions were estimated based on the City's building inventory and by using assumptions from the City of Edmonton's Building Energy Benchmarking Program Dashboard - Year 6 Report[66]. Additionally, during engagement activities, it was also identified that those involved in the energy efficiency sector felt that loan financing would be of greater benefit to small businesses and organizations, those who could not receive funding and/or those who did not already have corporate GHG mandates to fulfill.

Many of the efficiency programs have equity embedded and provide some level of subsidization to income-qualified participants. These often include waived or reduced administration fees, rebates for specific equipment upgrades and energy audits, and no-cost items. Financial incentives are further discussed and described in Section 7.2 – Financial Incentives.

[66] Ibid. footnote 57

Final program designs will also look at additional ways to embed equity into the program. For example, ways to minimize housing cost increases, tenant displacements, utility cost increases and community trust and buy-in.

7.1.2.7 Eligible Retrofits and Mandatory Requirements

PACE programs can include a variety of retrofit measures; however, they are typically aimed at retrofitting the building as a whole system. Energy and water retrofits can include:

- Lighting Systems: LED lighting is more energy-efficient than traditional lighting systems, and it lasts longer, reducing the need for frequent replacements. According to the Department of Energy, lighting represents 10% of commercial building energy use, making it a significant target for energy savings[67].
- HVAC Systems: Heating, ventilation, and air conditioning (HVAC) systems can represent up to 40% of a building's energy use[68]. Replacing outdated systems with newer, more efficient models including heat pumps can result in significant energy savings.
- Building Envelope: The building envelope includes walls, roofs, and windows and doors, and can significantly impact a building's energy use. Upgrading insulation, sealing air leaks, and upgrading windows and doors can result in energy savings and improved occupant comfort.
- Low-Flow Fixtures: Low-flow fixtures can significantly reduce water consumption in buildings. Water Sense labelled low-flow faucets reduce a sink's water flow by 30% or more from the standard flow of 2.2 gallons per minute (GPM) or 8.3 liters per minute (LPM) down to 1.5 GPM (5.7 LPM). Standard toilets use 1.6 gallons per flush (GPF) or 6.05 liters per flush (LPF), while highly efficient Water Sense labelled models use 1.28 GPF (4.85 LPF). Water Sense labeled toilets can reduce water use by 20% or more[69].
- Once-Through Cooling Equipment: Single-pass or once-through cooling (OTC) systems, also known as single-pass cooling systems use water to remove heat and cool equipment components. After water is passed once through a coil within or casing around a piece of equipment, the water is discharged to the sewer. Many businesses use once through cooling equipment in welding equipment, air conditioners, ice making machines, and industrial and laboratory equipment. Replacement of such equipment can significantly reduce water consumption; however, the exact impact is dependent of the specific application[70].
- Automation and Controls: Automation and controls can contribute to energy and water efficiency through optimized operations, demand responses, data analytics

[67] U.S. Energy Information Administration. Energy Use in Commercial Buildings (2023). Retrieved from https://www.eia.gov/energyexplained/use-of-energy/commercial-buildings.php
[68] Science Direct. Building energy management decision-making in the real world: A comparative study of HVAC cooling strategies (2021). Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S2352710220335026
[69] Unites States Environmental Protection Agency (2023). Water Sense Professional Certification. Retrieved from https://www.epa.gov/watersense/watersense-products
[70] Capital Regional District. Once-Through Cooling Systems (2023). Retrieved from https://www.crd.bc.ca/education/water-conservation/at-work/cooling-systems

and smart control technologies and irrigation systems. The exact impact of automation and controls on efficiency varies widely depending on the specific application and the level of investment in these technologies. However, when implemented effectively, they have the potential to deliver substantial energy and water savings, reduce operating costs, and contribute to sustainability goals.

- Renewable Energy: In the context of building energy efficiency, renewable energy sources like solar panels, geothermal and wind turbines are integrated into the building's infrastructure to generate clean electricity on-site. This approach reduces a building's reliance on conventional grid power, thereby lowering energy costs and carbon emissions. Renewable energy technologies for buildings not only provide a sustainable and eco-friendly energy source but also contribute to greater energy independence and long-term cost savings.
- Electric Vehicle (EV) Charging Stations: EV charging stations installed in or around buildings offer multiple benefits for energy efficiency. These stations support the adoption of electric cars, which are inherently energy-efficient and produce fewer emissions. From a building perspective, providing EV charging infrastructure encourages sustainable commuting and enhances the overall energy efficiency of the facility. Moreover, integrating smart charging solutions allows building owners to manage and optimize the use of electricity for EV charging, ensuring efficient energy distribution and reducing peak demand loads on the building's electrical system.

Technical specifications including eligible project timelines will be considered during the final program design.

Furthermore, eligibility criteria, including the caveat that building owners and property managers will not be eligible to submit more than one application, and mandatory participatory requirements such as energy audits, participation in the BLD program and minimum energy efficiency reductions or performance expectations will also be considered during final program design.

7.1.3 Benefits

This section explores the benefits that a C-PACE loan program can provide.

7.1.3.1 Economic

Energy retrofits aim to generate utility bill savings for building owners through reduced energy consumption. A deep retrofit with an extensive overhaul of building's systems can save up to 60% in energy costs[71]. Additionally, retrofitting can increase the value of the building, increase resiliency, and attract tenants, leading to higher rental income. Furthermore, the loan program can create jobs in the energy efficiency industry, boosting the economy. For the City, PACE programs can be cost-neutral, or can even generate revenue to be reinvested for additional programming aimed at promoting energy efficiency in the ICI building sector.

[71] Ibid. footnote 56

7.1.3.2 Environmental

PACE loan programs typically offer loans that target retrofitting the building-as-a-whole, in comparison to just replacing a single piece of equipment with an energy efficient model. This approach maximizes energy and GHG emission reductions in this sector and aids in achieving municipal, national, and international climate change targets.

7.1.3.3 Equity

PACE financing programs often have streamlined application processes that rarely require credit checks, income verification, or mortgage consent making it easier for property owners to access financing for energy and water efficiency upgrades. They can be designed to offer equity components to income-qualified owners, smaller and medium businesses, or affordable housing providers.

7.1.4 Discussion

A PACE loan program can provide building owners with access to the capital required to facilitate whole-building retrofits that result in GHG emission reductions, utility cost savings for building owners and renters, increased durability, safety and resilience of the buildings, and a stimulation of the local economy.

Despite the success of the C-PACE financing mechanism in the U.S., its implementation in the ICI/MURB sector is still in its initial stages throughout Canada. The ICI/MURB sector encompasses a wide range of buildings and businesses, making the energy audit requirements complex and cost intensive which PACE financing can help with.

Survey results indicate that the ICI/MURB sector shows a preference for rebates over loan financing; however, low-interest rates, no complex underwriting process, and flexible term options such as no penalty for early repayment would be key drivers for choosing PACE loan financing for the small and medium size buildings including MURBs.

Financing programs require significant capital through loans or other means and cost the municipality to administer. However, these costs can be passed on to the participants, and if administration costs and interest rates are kept low, can still be favourable to participants and be feasible for the municipality to finance.

7.2 Financial Incentives

Financial incentive programs promote energy and water efficiency upgrades by providing financial assistance to building owners and property managers. This often allows the building owners or property managers to achieve long-term financial payback by reducing the upfront capital cost associated with the upgrade but comes at high capital cost to finance the rebates. Financial incentives typically include rebates and no cost items, grants, or subsidies. Table 5 summarizes three types of financial incentives.

Table 5 - Summary of Financial Incentive Types

Rebates and No Cost Items	Grants	Subsidies
• Encourages consumers or businesses to adopt specific products, services, or behaviors that improve energy efficiency or are more environmentally friendly. • Applied after the purchase or implementation of the desired product or service. Consumers or businesses make the initial payment, and then they receive a portion or the full cost of the product or service amount back as a rebate.	• Supports energy efficient programs, initiatives, or research in targeted beneficiaries to accelerate adoption, to address an underserved population, address a community need, or stimulate innovation. • Provided by governments, foundations, or organizations. • Requires submission of a proposal/application and are competitive with the selection process based on the merit of the proposal. • Provided as a lump sum or installments in alignment with the proposal and grant requirements.	• Financial assistance that reduces the overall cost of goods or services to support essential sectors, encourage specific economic activities, or assist disadvantaged groups. • Applied upstream of the value chain of an energy efficient product with the benefits passed on to consumers. • Broad-based or targeted, benefiting entire industries or specific groups. • They can take the form of direct payments, tax breaks, or reduced fees.

7.2.1 Municipal Best Practices

Of the municipalities reviewed, Edmonton, York, Toronto, Montreal, and Surrey offer financial incentive programs for energy and water efficiency upgrades and renewable energy installations for building owners within the ICI building sector. Many other financial incentive programs offered throughout Canada for the sector are administered and funded by either the local utility provider or another level of government and not the municipality.

7.2.1.1 Rebates and No Cost Items

The City of Edmonton's Building Retrofit Accelerator Program (BRAP), which is now closed to new applications, offered rebates of up to $125,000 per building for lighting, HVAC, hot water, building envelope upgrades and solar installations, and up to $75,000 for buildings that did not pursue upgrades that include solar PV installations. Eligibility requirements to participate in this program include that the building must be 1000 sqft or larger, consume less than 15 GWH of electricity per year, and be a participant in Edmonton's Building Energy Benchmarking Program (see Section 7.3 for a discussion on Benchmarking programs). Additional rebates were also offered to building owners seeking Energy Star certification (Section 7.4) through the program.

The City of York offers Water Saving and Protection Incentives for Businesses in the form of two programs: the ICI Capacity Buyback Incentive Program and the Water Efficiency Equipment Replacement Initiative program.

- The ICI Capacity Buyback Incentive Program: Offers high water using businesses up to $50,000 in the form of a capacity buyback to make water

efficiency improvements or install submeters. A capacity buy-back program is a program where a utility provider buys back the capacity that has been reduced by a retrofit or efficiency improvement. In this example, the City of York distributes the municipal water supply and then buys back the capacity of water that has been reduced through efficiency improvements from program participants. The value of the incentive is based on the type of water saving initiative implemented and the volume of water that is reduced. Eligible retrofits are based on a pre-retrofit analysis conducted by York Region or its agent.

- The Water Efficiency Equipment Replacement Initiative Program: Offers incentives of up to 50% of the total cost of the equipment replacement or up to a total incentive of $10,000. This program is open to all businesses and MURBs. Eligible equipment includes toilets, urinals, ice machines, condensing units, and other such equipment.

The City of Surrey Rental Apartment Efficiency Program is a CEAP for rental apartments. The City of Surrey partnered with FortisBC and Landlord BC to help rental apartment building owners and property owners renovate to save money, energy, and water. No cost energy, water, and money saving efficiency measures and education tools are provided to property managers and owners of eligible apartment buildings, hotels, and motels. The program provides free energy audits, the installation of low-flow showerheads, faucets and aerators, and support services to assist with the implementation of efficiency upgrades.

Additional CEAPs offered by entities other than the municipalities include:

- BC Hydro's Business Energy-Savings Incentives Program: Provides funding for up to 25% of the cost to businesses for simple one-for-one replacements such as LED bulbs and strips, variable frequency drive (VFD) fans and pumps.
- Efficiency Nova Scotia's Free Energy Efficient Products and Installation Program: Professionals install LED bulbs, hot water tank wraps and faucet aerators to businesses that are electrically heated at no cost.
- Efficiency Manitoba offers the In-Suite energy Efficiency Program and the Small Business Program. These are separate programs are targeted at MURB's and small businesses, respectively. Both programs provide and installs free energy and water saving items such as LED bulbs, bathroom and kitchen faucet aerators, showerheads and timers, water heater pipe wraps, and attic insulation assessments. They also provide incentives for smart thermostats, advanced HRV control & installation, LED linear lamps, specialty bulbs and exit signs, lighting controls and pitched roof insulations.

7.2.1.2 Grants

Toronto's Deep Retrofitting Challenge, which is closed to new applications, was a competition style grant program funded by the federal government for 10 to 16 buildings with a floor space over 600 m^2 or greater than three storeys to undertake deep energy retrofits. Deep energy retrofits are defined as a reduction in building energy usage by 50% or more. MURBs, commercial and mixed-use building were eligible for grants of $200 per square metre of gross floor area up to a maximum of $500,000, or 25% of the

total project cost, whichever was less, to offset the incremental design and construction costs required to achieve maximum emissions reductions[72]. A total of eight buildings participated in the challenge and all projects are expected to be completed by early 2025. Once the projects are complete, the City plans to develop and release comprehensive case studies including retrofit designs, utility savings, project costs, and lessons learned.

7.2.1.3 Subsidies

Montreal's Affordable Housing Renovation program subsidizes affordable housing units up to $575,000 per unit to extend the usable life of the building, improve the tenant's quality of life and encourage ecological transitions. Eligible subsidies include up to 50% for the energy assessment, and 30-45% for the upgrades based on the type of upgrade performed. Eligible buildings must contain six dwelling units or more, be five storeys or fewer, be built more than 20 years ago, and one third of the dwelling units must meet the programs definition of affordable. Affordable is defined as one third of the units have rents equal to or lower than the table provided in the Affordable Housing Renovation Program's additional information guide. Eligible retrofits include energy and water efficiency improvements, along with structural, interior construction and furnishings, and exterior projection such as balconies. Mandatory program requirements include upgrading the building's oil-fired boiler, central furnace, and water heater as part of the work performed, and ensuring that tenant displacement does not occur at the time the building is being renovated. The Province of Quebec and the City of Montreal jointly fund this program[73].

7.2.2 Program Considerations

The key considerations for a municipal financial incentive program include rebate capital required, operating costs, and eligible retrofits, as explained below. For this analysis, it is assumed that the financial incentive instrument is in the form of rebates and/or no cost items.

7.2.2.1 Rebate Capital and Maximum Eligible Rebates

Rebates are typically offered to cover a portion of the total cost to replace equipment with more efficient models or to perform energy audits. Whereas no cost items cover the entire cost of the upgrade or energy audit. No cost items are typically offered to building owners, property managers and tenants to make easy one-to-one replacements such as replacing faucets, thermostats, and bulbs with more efficient models. The level of rebate offered usually depends on the type of equipment being replaced and the energy saving potential of the new equipment. However, rebates may also be in the form of a flat rate or a percentage of the total cost of the upgrade based on the activity performed, performance achieved, or the type of equipment replaced.

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[72] City of Toronto. Deep Retrofit Challenge (2023). Retrieved from https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives/deep-retrofit-challenge/

[73] City of Montreal. Affordable Housing Renovation Program (2023). Retrieved from https://montreal.ca/en/programs/affordable-housing-renovation-program

Typical rebates for the ICI building sector as seen in other programs, such as the City of Edmonton's BRAP, range from $75,000 per building up to $125,000 per building, for buildings that have included rooftop solar in their renovations.

Financial incentives in the form of rebates or no cost items for a pilot program could be funded by generating revenue through PACE administration fees, by leveraging external grant funding, through partnerships with local utilities or other organizations, or through property taxes.

The eligible final rebate amounts will be confirmed during final program.

7.2.2.2 Operating Costs and Administration Fees

Operating costs include administering the rebates, marketing, outreach, and evaluation of activities. For this analysis, it is assumed that rebates are administered by the City and will be processed by Sustainability staff during the loan application process.

Administration fee's will be confirmed during final program.

7.2.2.3 Target Audience and Subsidization

Programs can be targeted at the full sector, or to a segment to enhance affordability and equity. Section 7.1.2.6 above, explores the benefits associates with targeting specific subsectors, while considering equitable design considerations.

7.2.2.4 Eligible Retrofits and Mandatory Requirements

Rebate programs can include a variety of retrofit measures, aimed at replacing existing equipment with new more efficient technologies or to adopt services or behaviors such as energy audits. Eligibility criteria for equipment retrofits also typically include minimum product efficiency requirements. For a full list of possible energy and water efficiency retrofits, see Section 7.1.2.7.

Technical specifications including eligible project timelines will be considered during the final program design.

Furthermore, eligibility criteria, including the caveat that building owners and property managers will not be eligible to submit more than one application, and mandatory participatory requirements such as energy audits, participation in the BLD program and minimum energy efficiency reductions or performance expectations will also be considered during final program design.

7.2.3 Benefits

The benefits of incentive programs that aim to reduce the cost of equipment replacements or specific energy efficiency upgrades include:

7.2.3.1 Economic

Incentive programs lower the cost of specific equipment upgrades or retrofits, improving the return-on-investment and allowing businesses to save money more quickly. By encouraging the purchase of new equipment, these programs can stimulate economic activity in the energy efficiency and construction industries, creating jobs and contributing to local economic growth.

7.2.3.2 Environmental

Newer, more efficient equipment uses less energy and water and reduces GHG's, contributing to the City's overall emissions reductions goals. Rebates targeted at water-efficient appliances may also contribute to the preservation of local water resources, especially in areas prone to water scarcity, and minimizes the environmental impact of water supply and treatment, reducing GHG emissions. As the City becomes more energy and water efficient, it is better prepared to withstand the potential impacts of climate change, such as extreme weather events, and water and energy supply disruptions. Further, rebates for water re-use projects could preserve or enhance green spaces and natural habitats.

7.2.3.3 Health

Improved indoor air quality resulting from the replacement of outdated HVAC systems and appliances can reduce the risk of respiratory illnesses and allergies. Improved occupant comfort can result from the use of newer, more efficient equipment. Newer equipment is often designed with the latest technology and can provide better temperature control, improved ventilation, and reduced noise levels.

7.2.3.4 Equity

Energy efficient equipment can make housing more affordable by reducing utility bills. Financial incentives can be targeted at affordable housing, MURBs, or other underserved groups to enhance energy performance and reduce costs for low-income residents and/or small-medium businesses. This is common through CEAPs as described in the best practice scan.

7.2.4 Discussion

Financial incentives for equipment replacement in ICI buildings and MURBs can provide economic, environmental, and social benefits. Offering rebates and no cost items allows building owners to get a better payback on their energy and water efficient retrofit investments. Rebates were the most supported program instrument through both the survey and engagement activities. Financial incentives can be used to target specific retrofits/equipment to encourage GHG reductions and other benefits.

While there are costs associated with administering these programs and offering financial incentives to participating businesses, there is no revenue anticipated for the City as the administrator of this program.

Financial incentives can be used in conjunction with other energy efficiency-related instruments to encourage uptake in C-PACE or BLD programs. Revenues from C-PACE can also be used to fund incentives.

7.3 Energy and Water Benchmarking, Labelling, and Disclosure

BLD programs have gained importance nationwide as an initial step in understanding a building's energy performance. BLD tools allow building owners to identify energy-saving opportunities by tracking their consumption and identifying opportunities for improvement, which could lead to reduced energy consumption and lower utility bills

over time[74]. Energy consumption baselines provide a reference point for identifying inefficiencies and potential energy-saving opportunities. With access to accurate and granular energy data, building owners and operators can make data-driven decisions and implement targeted energy-saving measures to optimize building performance and reduce energy costs[75]. BLD programs allow for data transparency, the sharing of best practices, and showcase leadership efforts taken by building owners to encourage additional energy efficiency investment in our community.

ENERGY STAR Portfolio Manager (ESPM): ESPM is a free US Environmental Protection Agency (EPA) benchmarking tool. In Canada, the ESMP is managed by NRCan, and is the primary benchmarking program used throughout Canada. The tool measures, monitors, and discloses energy use and provides eligible buildings with an ENERGY STAR score, weather-normalized energy use intensity (EUI) benchmarks, and carbon emissions estimates. Buildings can also earn ENERGY STAR certification through the program if their buildings earn a score of 75 or higher (out of 100). ENERGY STAR scores are based on the actual, measured energy use of a building, and account for differences in operating conditions, weather, and other important considerations calculated directly within the tool.

Interactive dashboards or platforms can also be utilized to enhance the usability and management of the ESPM tool. Interactive dashboards can provide building owners, and municipalities with user friendly visual data and program management instruments that assist in tracking and validating data. Dashboards are developed and maintained and hosted by third party contractors.

Furthermore, BLD programs can enable municipalities to monitor building performance, mandate future energy reporting regulations or policy developments, and to incentivize energy and water efficiency programs.

7.3.1 Municipal Best Practices

BLD programs are administered at both the provincial and municipal levels, with support from the federal government.

All 8 jurisdictions reviewed currently offer bylaw mandated or voluntary BLD programs. Vancouver, Montreal, Toronto, and Ottawa have implemented mandatory reporting requirements, while Edmonton, Calgary and Winnipeg still offer voluntary programs at this time[76]. Many provinces also offer BLD programs that are administered by the province. Of the provincial programs, Quebec, Ontario, and New Brunswick have mandatory disclosure requirements for building owners based on the size of the

[74] Natural Resources Canada. Energy Star Portfolio Manager (2023). Retrieved from https://natural-resources.canada.ca/energy/efficiency/buildings/energy-benchmarking/3693
[75] Efficiency Canada. Unlocking the Potential of Mandatory Building Performance Standards through Benchmarking (2023). Retrieved from https://www.efficiencycanada.org/codes-mandatory-building-performance-standards
[76] U.S Environmental Protection Agency. Benchmark Your Building Using ENERGY STAR® Portfolio Manager® (2023). Retrieved from https://www.energystar.gov/buildings/benchmark

buildings, whereas British Columbia and Nova Scotia offer voluntary programs.
Mandatory Energy Use Data Disclosure Regulations

Toronto and Ottawa currently follow the same regulations as the province of Ontario, which is that all buildings that are greater than 50,000 ft^2 must report and disclose their energy consumption on an annual basis[77]. The City of Ottawa is in the process of developing an energy disclosure and performance bylaw which may mandate additional buildings to participate in the program. Currently, all buildings over 20,000 $sqft^2$ are being encouraged to participate[78].

The City of Vancouver's bylaw mandates that commercial buildings greater or equal to 100,000 ft^2 disclose their energy use[79]. By 2024, the regulation will be for all commercial buildings greater or equal to 50,000 ft^2 and for MURBS greater or equal to 100,000 ft^2 report. Vancouver is the only jurisdiction to also introduce reporting requirements for GHG intensity (GHGi) limits and Heat Energy Limits, which will all be mandatory by 2040.

The City of Montreal's bylaw mandates that all buildings greater than 50,820 ft^2 or that have 50 or more dwelling units disclose their energy use. By 2024, all building greater or equal to 21,528 ft^2 or that have 25 or more dwelling units will also be required to report[80].

7.3.1.1 Voluntary Energy Use Data Disclosure

Calgary, Edmonton, and Winnipeg offer voluntary BLD programs. Data disclosure rates range from about 60-100% depending on the program.

The City of Edmonton offers the Building Energy Benchmarking Program, which has helped over 1000 buildings measure and track their energy performance since 2019. The program offers interactive energy performance maps in the form of an interactive dashboard, provides detailed energy performance scorecards to each participant, provides information sessions and benchmarking workshops, publishes an annual report, and has an annual awards ceremony. The program also offered rebates of up to $10,000 (max 50% of the total cost) to participants to complete an American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Level 2 Energy Audit[81]. At this time, this incentive is no longer available.

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[77] Government of Ontario. O. Reg. 506/18: Reporting of Energy Consumption and Water Use (2023). Retrieved from https://www.ontario.ca/laws/regulation/180506

[78] City of Ottawa. Better Buildings Ottawa Strategy (2023). Retrieved from https://ottawa.ca/en/living-ottawa/environment-conservation-and-climate/climate-change-and-energy/better-buildings-ottawa#section-156b963b-fbe5-482a-b566-7d00013b00e8

[79] City of Vancouver. Annual Greenhouse Gas and Energy Limits By-Law No. 13472 (2023). Retrieved from https://bylaws.vancouver.ca/consolidated/13472.PDF

[80] City of Montreal. By-law concerning GHG emission disclosures and ratings of large buildings (2023). Retrieved from https://montreal.ca/en/articles/law-concerning-ghg-emission-disclosures-and-ratings-large-buildings-20548#:~:text=To%20achieve%20this%20goal%2C%20the,force%20on%20September%2027%2C%202021.

[81] American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) (2023). Retrieved from https://www.ashrae.org/technical-resources/bookstore/procedures-for-commercial-building-energy-audits

The City of Calgary offers the Commercial and Institutional Building Energy Benchmarking Program. The program also launched in 2019 and has had over 350 participants. Like Edmonton's BLD program, this program also offers interactive energy performance maps in the form of an interactive dashboard, provides detailed energy performance scorecards to each participant, provides information sessions and benchmarking workshops, publishes an annual report, and has an annual awards ceremony.

The City of Winnipeg offers the Building Energy Disclosure Project. This program, which also launched in 2019, uses ESPM to provide a tool to help commercial and institutional building owners better understand the energy performance of their buildings while supporting overall reductions in greenhouse gas (GHG) emissions and energy consumption.

All three programs were funded in 2019 through the NRCan Financial Assistance for Benchmarking, Labelling and Disclosure Initiatives under the Pan-Canadian Framework on Clean Growth and Climate Change.

7.3.2 Program Considerations

The key considerations for municipal BLD programs include capital and operating costs, tools used, and targeted audience to develop, implement, and host an interactive BLD dashboard on the City website.

7.3.2.1 Costs

Setting up the necessary infrastructure for collecting energy consumption data, transferring of the data between the platform and the local utility providers incurs initial costs and the annual consultant cost to host and maintain the dashboard is estimated to cost $100,000 for two years.

Resources would be required to administer the program for initial set-up (recruiting, communications, platform establishment, and data entering/interpretation), and interpreting energy data); ensuring data privacy and security; and ongoing monitoring and maintenance of the data collection systems, privacy protocols, and cybersecurity measures. Communication resources would be essential in conducting outreach campaigns, training sessions, and educational materials to engage building owners, occupants, and stakeholders on the benefits of energy data reporting, disclosure, and benchmarking opportunities.

7.3.2.2 Tools

Programs can be developed using the free version of the ESPM tool only or by procuring contractor services to develop and manage an interactive dashboard in addition to the free version of the ESPM tool.

7.3.2.3 Target Audience

Programs can be targeted at the full sector, and at civic buildings to lead by example.

7.3.3 Benefits

Several benefits can be realized by offering a BLD program to Saskatoon's ICI/MURB sector:

7.3.3.1 Economic

By optimizing energy usage and identifying operational inefficiencies, a BLD program could result in cost savings associated with maintenance, repairs, and equipment replacement for building owners in the long term. Stimulation of the local economy and job creation could also result from the implementation of a BLD program. As building owners gain the required knowledge to incorporate energy and water efficiency improvements into their long-term strategic planning through benchmarking opportunities the demand for newer more efficient technologies will increase along with the need for skilled trades within the sector.

Improved energy performance ratings, and Energy Star certification (see Section 7.4) resulting from the program could enhance the market value and desirability of ICI buildings as energy-efficient buildings are increasingly sought after by tenants, investors, and other stakeholders who value sustainability.

7.3.3.2 Environmental

Energy efficiency improvements driven through a BLD program can help mitigate the environmental impact of ICI/MURB buildings in the long term by reducing carbon emissions and other pollutants.

The development of future policies that are informed by accurate building energy use and carbon emission details could promote future GHG emissions reduction goals.

7.3.3.3 Health

Opportunity to improve indoor and outdoor air quality, resiliency, and comfort for building occupants through efficiency improvements to buildings.

7.3.3.4 Equity

A BLD program can offer resources, tips, case studies, and an interactive tool to learn about energy efficiency. A BLD program could help alleviate the effects of energy poverty by providing the tools and resources needed to understand energy and water consumption and then to make an impact to conserve both energy and water, which will ultimately decrease the cost of utilities.

7.3.4 Discussion

Energy BLD programs are noted as ideal steppingstones for municipalities to educate, inform, make data informed decisions, and motivate building owners to start their energy retrofitting journey. These programs help establish accurate baselines and performance levels, thereby effectively demonstrating the potential benefits and opportunities for improvement. By implementing a BLD program, the City could drive the implementation of energy and water efficiency improvements, GHG emission reductions and the prioritization of the application of technology and emerging trends in Big Data Analytics to improve services and processes that meet the changing needs of residents and businesses[82].

[82] City of Saskatoon. 2022-25 Strategic Plan (2023). Retrieved from https://www.saskatoon.ca/sites/default/files/documents/2022-2025_cos_strategic_plan.pdf

Furthermore, BLD programs were supported through both the survey (3rd most supported) and in person engagement meetings conducted with various property managers throughout Saskatoon. Participants specifically called for more personal assistance in identifying what retrofits will work best for their building and stressed the importance of success stories from other businesses who implemented energy efficiency retrofits. Many building owners also stated that there is a lack of knowledge when it comes to tracking energy use and that they are unaware of how to even begin or what the associated benefits would be if they were to upgrade their buildings to be more energy efficient.

Not only would a BLD program allow building owners to develop an energy baseline and track their energy performance overtime, ultimately reducing GHG emissions by saving energy and water. It would also allow for the City to develop an energy consumption baseline, monitor building performance, mandate possible future energy reporting regulations, and incentivize future energy efficiency programs[83].

A BLD program could provide building owners with the tools and resources to measure and quantify their own energy consumption, set goals, and track the impact of their investments[84]. This would allow business owners to claim that they are conducting transparent and sustainable operations in a competitive environment. A benchmarking tool would allow building owners to share best practices and learn from each other to focus the improvements that will make the most impact on their buildings.

Although there are benefits to offering a BLD program for the Saskatoon ICI/MURB sector, significant energy savings and GHG emissions will not be realized immediately. Not only are the benefits in terms of the environmental impact small, but the capital cost of hosting and maintaining an ICI/MURB energy and water BLD program are high.

Participation and motivation in BLD programs have been identified as a challenge for many building owners as the time and resources required to participate are intensive. Incentives to participate such as rebates, no cost items, and competitions like Edmonton's annual award ceremony and an extensive communications campaign are required to promote participation in such programs.

7.4 Capacity Building, Networking, and Education

Capacity building, networking, and education programs are common enabling activities to promote water and energy efficiency and decarbonization activities. Approaches seen throughout jurisdictions are educational videos, guides, and webpages, decision making tools and certification programs.

7.4.1 Municipal Best Practices

Seventy percent of the municipalities researched offer various forms of capacity building, networking, and education programs.

[83] Ibid. footnote 75
[84] Ibid. footnote 75

Educational videos such as the City of Edmonton's Environment, Climate Change Energy Videos, guides such as Edmonton's Change Habits for Climate Guide, and webpages such as the City of Ottawa's How Can You Take Action on Climate Change provide building owners with energy savings tips, information on current technologies, and ideas on what actions to take to reduce their impact on climate change, energy consumption and GHG emissions.

The City of Vancouver promotes the Zero Emissions Building Exchange as a resource for increasing the knowledge, capacity, and passion for building owners to maintain cost-effective and low energy buildings.

A variety of decision-making tools have also been developed by municipalities and are offered to support building owners and property managers starting their energy reduction and decarbonization path, including:

- The City of Toronto's Better Building Navigation and Support Services, offers building owners, operators, and property managers a one on one support service to navigate the process of improving energy efficiency in their buildings.
- CleanBC offers Energy Coaching services for building owners and managers throughout the province of BC.
- The City of Vancouver provides support services for MURBs owners and property managers to assist with the upcoming 2024 mandatory annual energy and carbon reporting regulatory requirements.
- The City of Toronto offers Sustainable Towers Engaging People (STEP) Program for MURB buildings owners and property managers that have buildings over 3 storeys or more and that were building before 1990. The program provides no-cost support to reduce operating costs and improve the quality of life for residents. The program includes benchmarking, audits, individualized targets to improve the buildings utilities performance, a customized action report and capital improvement plan with recommendations to lower costs and increase tenant satisfaction, financing opportunities (including access to TATR, Hi-RIS) and access to peer network, education, events, case studies and more[85].
- Solar Potential maps such as Saskatoon's Residential Solar Potential Map help residential homeowners identify what the solar potential for their building is. The maps are user friendly and allow the user to explore personalized estimates on the financial and environmental benefits associated with solar PV installations.
- Online tools such as Saskatoon's SmartUtil and Toronto's My Water Toronto and Powerlens are helpful starting points for building owners to track their energy use and make informed decisions on how to proceed with energy and water efficiency upgrades based on actual utility costs and energy use trends.

[85] City of Toronto. The STEP Program (2023). Retrieved from https://efaidnbmnnnibpcajpcglclefindmkaj/https://www.toronto.ca/wp-content/uploads/2017/11/8fd7-step_program_scores.pdf

- City of Hamilton's Proactive Leak Detection Program uses advanced technology to identify leak locations within the City's water distribution network. This allows for the early detection, repair of leaks and the replacement of pipe before breaks are to occur.

Certification programs like LEED, BOMA Best, ENERGY STAR®, Passive House Canada, Net Zero, Water Sense, IREE, ZCB and are also widely adopted by most of the municipalities and promote energy and water efficiency measures in ICI buildings.

- LEED: is a certification program that provides a framework for healthy, highly efficient, and cost-saving green buildings and is a globally recognized symbol of sustainability achievement.
- BOMA BEST: is certification program that encourages smart and sustainable solutions for existing buildings that promote health, efficiency, cost-effectiveness, and low-carbon performance. The certification program is also a globally recognized symbol of sustainability achievement that offers buildings both certifications and building managements tools.
- ENERGY STAR®: is an energy efficiency labelling program that is administered by the U.S. Environmental Protection Agency. In Canada, NRCan administers the ENERGY STAR certification program, which recognizes energy-efficient products, buildings, and practices. Buildings that achieve ENERGY STAR certification demonstrate superior energy performance compared to similar buildings.
- Passive House Canada: is a building performance standard administered by a Canadian non-profit professional association. Passive House is recognized internationally as the optimal way to build healthy, climate-resilient, affordable, and energy-efficient institutional, and commercial buildings through all stages of design, construction, and livability.
- ASHRAE Energy Audits: the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) offers standards and criteria for performing energy audits on buildings. ASHRAE has three levels of energy audits that increase in terms of the depth, scope, and detail. Level 1 is a walk-through survey, level 2 is an energy survey and analysis, and level 3 is a detailed analysis of capital-intensive building modifications.
- Canadian Home Builders Association Net Zero: is a Canadian home labelling program that provides the industry and consumers with a clearly defined and rigorous two-tiered technical requirement that recognizes Net Zero and Net Zero Ready Homes, and the builders and renovators who provide them.
- Water Sense: is a water labelling program administered by the U.S. Environmental Protection Agency and a resource for helping businesses save water. Water Sense-labeled products and services are certified to use at least 20% less water, save energy, and perform as well as or better than regular models.
- Investor Ready Energy Efficiency (IREE): is a Canada Green Building Council (CAGBC) certification program that signals to investors that projects were

developed by qualified professionals and meet the requirements of the Investor Confidence Project Protocols. The protocols provide a consistent roadmap for assessing risk and comparing retrofit project investment opportunities.

- Zero Carbon Building Standards (ZCB): is a CAGBC framework for zero carbon buildings. The ZCB standards are an important tool supporting the green building sector's efforts to decarbonize Canada's buildings.

7.4.2 Program Considerations

The key elements for municipal capacity building, networking and education programs include operating costs, as explained below.

7.4.2.1 Costs

Developing and implementing effective capacity building and education programs requires resources and funding. This can include the cost of hiring trainers or consultants, developing training and educational materials, delivering training sessions, attending in person event, and developing/hosting online services.

7.4.3 Benefits

There are significant benefits associated with conducting capacity building and education on energy efficiency for the ICI/MURB sector. These include:

7.4.3.1 Economic

By learning about energy-saving measures and implementing them, businesses can reduce their energy consumption and lower their energy bills. This can result in significant cost savings over time. Stimulation of the local economy and job creation could also result from the implementation of various enabling programs. As building owners gain the required knowledge and tools to implement energy and water efficiency improvements the demand for newer more efficient technologies will increase along with the need for the skilled trades within the sector.

Businesses that invest in energy efficiency can improve their competitiveness by reducing their operating costs and improving their bottom line. This can help them to stay competitive in their respective markets.

7.4.3.2 Environmental

Improved energy efficiency can result in reduced greenhouse gas emissions over time, helping to mitigate climate change and contribute to a more sustainable future.

7.4.3.3 Health

Through educational resources and tools on energy and water efficiency, home comfort and improved indoor air quality could be a result. For example, educational materials on how often to replace HVAC filters, or how to program thermostats correctly could lead to a reduction in energy consumption and GHG emissions while making the home or building safer and more comfortable.

7.4.3.4 Equity

Energy and water education can help alleviate energy poverty by providing the tools and resources needed to understand energy consumption and conservation. Energy and water education can be in the form of facts, myth busters and how-to guides that

can be distributed in pamphlets to community associations to ensure that all communities receive access to the education.

7.4.4 Discussion

Capacity building and education on energy efficiency could provide a range of benefits for businesses in the ICI sector. By improving knowledge and awareness of energy-saving measures, businesses may have the required tools needed to reduce their energy consumption, lower their energy bills, and improve their bottom line. While there are costs associated with conducting these programs, the long-term benefits may outweigh the short-term costs. Overall, capacity building and education on energy efficiency have been identified as important tools in promoting sustainability and energy efficiency in the ICI/MURB sector.

Subject matter experts who were interviewed during the engagement sessions and responded to the survey strongly supported programming for online tools such as decision-making tools, maps and calculators, and website information such as videos, factsheets, and webinars. They also supported delivering energy and water efficiency information through utility bills.

Although there are many benefits associated with capacity building, networking, and education, participating in such enabling activities requires a time commitment from businesses. This can be a challenge for busy ICI sector businesses that may struggle to find time for training and education or who do not have a dedicated resource responsible for energy management. In addition to the costs associated with the time commitment, there may also be costs associated with implementing energy-saving measures and education programs do not provide the upfront capital often required to drive the energy or water efficiency retrofit. For example, businesses may need to invest in new equipment or upgrade existing equipment to improve energy efficiency but may not have the capital to do so.

7.5 Comparison of Program Instruments

The programs offered for the ICI/MURB sector throughout Canada range from C-PACE financing programs to education campaigns and how-to videos on how to conserve energy and water. The program instruments are compared and summarized in Table 6, additional details explaining the comparison are provided in the section below the table.

Table 6 - Comparison of Energy and Water Efficiency Program Instruments

Program Instruments	Financing	Financial Incentives	Benchmarking, Labelling and Disclosure	Capacity Building, Networking, and Education
Target	Building-as-a-whole retrofits	Equipment replacements and energy audits	Enabling activities & baseline data	Enabling activities
Potential Energy use & GHG emission reductions	10-50% (up to a deep energy retrofit)	5-25%	No immediate reductions but will promote long term improvements	No immediate reductions but will promote long term improvements
Complexity	High	Low	Moderate	Low
Costs				
Capital cost	High	High	High	Low to Moderate
Operating cost	Moderate	Moderate	Moderate	Low
Repayment risk	Moderate	None	None	None
Payback Potential	High	NA	NA	NA
Benefits				
Environmental	High	Moderate	Moderate	Moderate
Economic	High	Moderate	Low	Low
Social/Health	High	High	Low	Low
Equity	High	High	Moderate	High

Target describes which type of activities the program promotes. PACE financing is ideal for extensive retrofits, rebates are tailored to specific equipment replacements and audits, benchmarking and disclosure are critical for establishing baselines across various building types, and capacity building and networking projects support education and understanding for a diverse range of businesses and building owners.

Potential energy use and GHG emissions are assessed based on potential reduction that the instrument offers. PACE financing is effective in driving GHG and energy reduction, particularly when applied to comprehensive retrofits in buildings. Energy efficiency rebates target specific upgrades, and depending on the nature of these upgrades, the potential for reducing GHG emissions and energy use varies. For instance, HVAC and boiler upgrades or replacements can achieve up to a 40% increase in energy efficiency. BLD projects establish the foundation for informed decisions and transparency. Capacity building and networking projects indirectly support GHG and energy reduction by educating and fostering a culture of energy efficiency.

Program instrument complexity is assessed in terms of time and resources required for implementation and administration. For example, PACE financing requires coordination between multiple departments and implementation duration will vary depending on the scope of the program, encompassing the time required for review, design, and execution. Oversight is essential to ensure compliance with financing terms. Rebate programs involve managing application processing, verification of project eligibility, and disbursing rebates. BLD programs demand data collection, analysis, and reporting. Data management is critical for accuracy and transparency. Capacity building and networking programs require the need for effective scheduling and facilitation of educational events and networking opportunities. Strong coordination and communication are key.

A cost and benefit assessment of the program instruments was completed based on the amount of capital and operating costs required and the programs perceived economic, environmental, and social benefits. A full-scale PACE loan program has the highest potential to create local jobs, provide significant utility savings, increase renewable energy generation, meet GHG reduction targets, increase building safety, comfort and resiliency and can be designed with an equitable lens. However, the capital cost required to offer a PACE program can be high. Other risks include default on repayment, which has been found to be extremely low in other municipalities and program uptake, which was found to be moderate in other municipal C-PACE programs. See Section 7.1.1, discussion on existing municipal C-PACE program uptake.

Financial incentives in the form or rebates and/or no cost items can offer significant benefits in terms of environmental and social/ health benefits. However, the economic benefits can be limited compared to financing programs due to the high capital cost required to fund the program and given that there are no opportunities for a return on the City's investment. Alternatively, rebate programs can provide a better return on investments for building owners by decreasing the capital costs associated with making energy efficiency improvements and can be used to incentivize building owners to participate in other programming such as a BLD or C-PACE program. Additionally, there are no risks associated with repayments or program uptake.

Energy benchmarking and data disclosure initiatives may not yield immediate benefits, but over time, they establish a foundation for informed decision-making, future policies, and continuous improvement in energy efficiency. Capacity building efforts, while not providing instant results, empower individuals and organizations with the knowledge and skills needed to make sustainable energy choices, leading to long-term energy savings and environmental benefits.

According to this analysis, all program instruments provide some level of economic, environmental, and social benefits. However, a financing and financial incentive programs have the potential to realize the most significant benefits in terms of local job creation, energy and water savings, increased safety, comfort and building resiliency and GHG emissions.

8 ICI Pilot Programs

A suite of ICI pilot programs was developed using the program efficiency instruments described in Section 7. Based on the outcomes from the TBL, best practice research, engagement strategy, and the cost benefit analysis conducted on the program instruments, the program instruments have been packaged into four ICI programs:

A. Small-Scale C-PACE Pilot Program for MURB's.
B. Medium-Scale C-PACE & Commercial Energy Assistance Pilot Program for Small and Medium Size Businesses and MURBs.
C. Full-Scale C-PACE Program for ICI/MURB Buildings.
D. Benchmarking, Labeling and Data Disclosure Program with an Interactive Dashboard (no C-PACE program).

A free version of a BLD program using ESPM could be developed to complement any of the four programs described below; this can be done with existing capital funding. Participation in the BLD program will be built into programs A-C as a prerequisite for participation to aid in the continuity and uptake for the BLD program.

Each of the proposed pilot programs are described and analyzed in the following sub-sections. The programs have been evaluated using the same overarching principles that were used to design HELP. These principles are:

- Financial sustainability,
- GHG reduction potential,
- Potential uptake of the program,
- Preference of stakeholders,
- Equity considerations, and
- Compatibility with existing City programs, and precedence in other jurisdictions.

A financial analysis was conducted for each pilot program using the following assumptions:

- Estimated average loan amount of $450,000 per building. A retrofit cost of $450,000 is not expected to support the entire ICC associated with a building retrofit. However, it will provide building owners with funding to leverage existing programs or existing internal funding and will allow for a distribution of funds to a broader group of building owners.
- Cost of borrowing capital and cost of lending are both charged at a 6% interest unless an interest rate rider is used.
- Loan terms of 20 years.
- A one-time administration fees would be charged to participants without any interest and would be paid over the 20-year loan term.
- Operating costs for the program were pro-rated based on the volume of loans, including staff and communications. A full time Environmental Coordinator can process up to 100 C-PACE loan applications in one year. Section 7.1.2.1 – Loan Capital and Average/Maximum Loan Amount per Building and Section 7.1.2.4 - Operating Costs and Administration Fees provides a detailed discussion and

analysis of the retrofit and staffing costs associated with municipal C-PACE programs.

Each program will also aim to include equitable elements into the design of the website, application process, and materials, which may in include:

- Use of plain language and clear communication,
- Use of multiple languages (where applicable),
- Use of multiple formats including online or over the phone, and
- Use of the HELP pre-vetted contractor list.

Administration may be eligible to apply for and leverage:

- The FCM Signature Initiative Pilot Project grant funding of $500,000 or up to 50% of total project cost, whichever is less; or
- The FCM Signature Initiative Capital Project for a low-interest loan of up to $10M or 80% of the total project cost, and a grant of 15% of the total loan amount.

Capital borrowing blended with grants and loans will further reduce operating costs and may also allow for additional equity measures to be introduced to the final program design.

These ICI pilot programs include some design considerations; however, the final design, bylaw, and financing details will require further reporting and approval. See Section 7.1.2 – Program Considerations for a detailed discussion on the program design considerations for a C-PACE program.

8.1 ICI Program A - Small-Scale C-PACE Pilot Program for MURBs

This program includes a C-PACE program targeted at up to 15 MURBs (5 buildings per year). The program would provide loans to multi-unit building owners that would then be repaid through property taxes using the PACE financing model. Loans would be offered at flexible terms from 5 to 20 years at a rate equal to the City's borrowing rate. Program development will require approximately 1 year of planning and implementation and will run for three years.

For a detailed discussion on the target subsector, see Section 7.1.2.6.

The program would be used to pilot a C-PACE financing program that can be improved upon to be scaled to additional buildings within the ICI/MURB sector.

8.1.1 Financial Analysis

Table 7 below provides a cost breakdown of the financial analysis along with the assumptions used to conduct the analysis. The estimated total program cost is ~$6.9M which includes a loan capital cost of $6,750,000 and an operating cost of $107,000 to administer the program.

Table 7 - ICI Program A - Financial Analysis

	Amount ($)	Assumptions
Funding		
Borrowing	$6,750,000	Average Loan of $450,000 * 15 buildings
Administration Fee Revenue	$107,000	$7,134 per participant * 15
Total Funding	**$6,885,000**	
Costs		
Participant Loans	$6,750,000	
Operating	$92,000	Includes: Staff costs for Environmental Coordinator (Fixed + Operational cost = 25% annually) & Communications staff.
Contingency	$15,000	
Total Costs	**$6,857,000**	**Loan capital + Operating costs**

In this analysis, it was assumed that it would require 25% of an Environmental Coordinator for three years to administer 15 loans. An administration fee of 1.6% of the anticipated average loan amount of $450,000 per building or ~$7,150/building would achieve cost neutrality to operate the program.

Alternatively, a 2% administration fee of ~$9,000 could be charged to each participant to recover the operating costs and subsidize an affordable housing component embedding equity into the program. Equity considerations will be further evaluated during the final program design. With this example, charging a 2% administration fee would provide a surplus of $28,000 at the end of the program, which could allow for waiving or reducing administration fees or providing rebates for the cost of energy audits to 2 affordable housing buildings[86].

An analysis for a small-scale program targeting 5 MURBs was conducted, however, an administration fee of 3.45% or ~$15,502 would be required to recover the cost to operate the program. An administration fee of 3.45% is considered high as compared to the existing C-PACE programs in Edmonton and Toronto, which range from 0.8% to 1.5%. Administration fees above 2% pose an increased risk to program uptake and are not considered feasible. This approach could be feasible if a grant was accessed to cover some or all the operating costs.

Following the approach identified in Section 7.1.2.3, by adding an interest rate rider on top of the City's borrowing rate for the loans, additional revenue can be generated. With an interest rate rider of 1%, a surplus of ~$900,000 could be realized in 20 years. The surplus generated would be used to enhance and expand the program upon completion of the 3-year pilot program. However, this can also be a disincentive for participation and will be evaluate further during program's implementation plan design.

[86] Ibid. footnote 65

8.1.2 Analysis Discussion

8.1.2.1 Financial Sustainability and Risk

ICI Program A is the lowest cost program in terms of both loan capital and operating costs. Program A could potentially be funded through an internal loan, which makes it more favourable than the higher cost programs due to the City's limited borrowing capacity for additional external loans at this time. The program can be structured to be financially self-sustaining with all operating and interest costs covered by fees paid by the participants with a small surplus.

Prorated staffing costs and fixed costs were used to evaluate the financial analysis of this pilot program. It was assumed that 25% of an Environmental Coordinator is required annually to support, review, and approve 15 loan applications. Existing resources will be reallocated to administer this program. However, if resources are not available at program launch, this poses a risk to the program. If full-time resources are required to administer this program, the operating cost of the program will be higher, and the program could go over-budget.

The program may be able to access $500,000 in FCM grants or a loan of up to $10M and grant of 15% of the total loan amount to offset operating costs, expand education or to offer the subsidized component of the program.

Offering loans to MURB property managers and building owners to perform energy and water efficiency retrofits allows for the savings associated with the cost of the utilities to be passed on to the tenants, which can ultimately benefit the community and help reduce energy poverty.

Due to the low number of targeted buildings in this program, the default repayment risk is very low.

8.1.2.2 GHG Reductions

It is anticipated that this program will result in an emission reduction of up to 592 tonnes of CO_2e from 15 MURBs. If the pilot proves successful, there is significant potential to scale up for reducing GHG emissions in MURBs and other buildings. MURBs and similar buildings in the ICI sector represent a significant energy use in buildings in Saskatoon (see Section 3.1). Hence, this will help to meet the targets set in the LEC Plan.

8.1.2.3 Potential Uptake

The risk of low uptake for this pilot program is the lowest as compared to ICI programs B and C with only 15 targeted MURB buildings. Existing relationships established during engagement with MURB managers can potentially be leveraged to mobilize participations in the pilot program. The program has the potential to be scaled up to 1,000 MURBs of the total 39,000 dwelling units in the city, based on the scope of energy retrofits or to other ICI/MURB buildings. Keeping administration fees at 2% or less is expected to help with uptake.

8.1.2.4 Stakeholder Preference

36% of survey respondents were somewhat to strongly interested in loan financing compared to higher levels of interest for rebates (88%), energy audits (68%), and

energy benchmarking tools (67%). When asked what size of loan participants would be interested in obtaining to complete building efficiency improvements, most participants indicated $100,000 or less (49%), followed by a loan in between $100,000 and $700,000 (20%). The largest group of respondents through engagement survey and meetings were those involved in MURB housing (26%).

8.1.2.5 Equity Considerations

Targeting the program at MURBs, can help improve energy efficiency, cost savings, and help alleviate energy poverty for renters and income-qualified residents, an underserved population within our community (see Section 7.1.2.6).

8.1.2.6 Compatibility With Existing Programs and What Other Jurisdictions Are Doing

The City has experience administering a financing program through HELP so will build upon those successes and learnings. The City will be offering a voluntary BLD program using existing resources which will complement uptake for this program. Additionally, staff time from HELP can potentially be shared to reduce the staff cost that will be carried by this program.

C-PACE programs currently do not have the same level of support from FCM, or as many opportunities to benchmark existing programs as the HELP program did during program development. C-PACE programs are just beginning to be expanded from the already established R-PACE programs by Canadian municipalities. As mentioned in the best practice research section, two cities have initiated pilot C-PACE programs for ICI and MURB buildings. This pilot program will build upon the successes and lessons learned through these programs.

Starting with a small-scale C-PACE program for 15 MURBs provides the City with an opportunity to learn and establish a strong pilot program that has the potential to be scaled in the future for up to 39,000 MURB units in 1000 buildings or to additional buildings within the ICI/MURB building sector.

8.2 ICI Program B – Medium-Scale C-PACE & Energy Assistance Pilot Program for Small and Medium Size Businesses and MURBs

This program includes a medium-scale C-PACE program for 50 buildings. The program will target MURBs, small and medium-sized commercial buildings and non-profit organizations. This will include a CEAP component to incentivize participation in the C-PACE component of the program. Program development will require approximately 1 year of planning and implementation and will run for three years. If successful, the program could be scaled to include all buildings within the ICI/MURB sector.

For a detailed discussion on the target subsector, see Section 7.1.2.6.

Loans would be offered at flexible terms from 5 to 20 years at a rate equal to the City's borrowing rate and a 2% administration fee or ~$9,000 will be charged to each program participant to achieve recover the operating cost of the program cost to offer the CEAP component of the program with the surplus generated at the end of the program. Partnerships (for instance with SaskPower) can also be explored to deliver the CEAP component during the development of the program implementation plan.

The CEAP component will be offered to program participants (small/medium businesses, non-profit and MURBs), and is expected to include rebates, no cost items, or a mixture of both. Rebates could be offered to offset the high costs associated with energy audits, and equipment replacements such as HVAC, lighting retrofits, and renewable energy installations. No cost items will cover the cost of small one to one replacement such as LED bulbs, VFDs for HVAC equipment, smart thermostats, and low-flow fixtures. Offering free items improves the return on investment for building owners and increases the capacity and awareness of small and medium-scale businesses and MURBs. Furthermore, a CEAP program would incentivize participation in both the C-PACE and BLD programs.

8.2.1 Financial Analysis

Table 8 below provides a cost breakdown of the financial analysis along with the assumptions used to calculate each cost. The estimated total program cost is ~$22.7 million, which includes a loan capital cost of $22.5 million and an operating cost of $220,000.

Table 8 - ICI Program B - Financial Analysis

	Amount ($)	Assumptions
Funding		
Borrowing	$22,500,000	
Administration Fee Revenue	$450,000	$9,000*50
Total Funding	**$22,950,000**	
Costs		
Participant Loans	$22,500,000	
Operating	$190,000	Includes: Staff costs for Environmental Coordinator (60% annually) & Communications staff.
Contingency	$30,000	
Rebates	$230,000	CEAP component offered to small/medium businesses, non-profit, and MURBs
Total Costs	**$22,720,000**	**Loan capital + Operating costs**

In this analysis, 60% of an Environmental Coordinator was assumed to administer loans for 50 buildings. A 2% administration fee of ~$9,000 charged to each participant would recover the operating costs and the CEAP rebates and no-cost items. Alternatively, an administration fee of 0.98% or $4,400 /building could be charged to recover the operating cost only and not offer the CEAP component.

$230,000 for the CEAP component could provide 11,500 LED bulbs (priced at $20 per bulb), which are at least 75% more energy-efficient than traditional bulbs[87], 766 smart thermostats, which can potentially increase HVAC efficiency by 8% compared to non-

[87] U.S. Department of Energy. LED Lighting (2023). Retrieved from https://www.energy.gov/energysaver/led-lighting

programmable thermostats[88], or up to 32 energy audits, which can provide building owners with energy and water savings opportunities.

Following the approach identified in Section 7.1.2.3, by adding an interest rider on top of the City's borrowing rate for the loans, additional revenue can be generated. With an interest rider of 1%, a surplus of ~$3M could be realized in 20 years. The surplus generated would be used to enhance subsidized energy efficiency programming and to expand the program upon completion of the 3-year pilot program. However, this can also be a disincentive for participation and will be evaluate further during program's implementation plan design.

8.2.2 Analysis Discussion

8.2.2.1 Financial Sustainability

ICI Program B requires more loan capital (~$22.7M) than program A and may be less favourable given the City's internal and external borrowing limits. The proposed program can be designed to be financially sustainable using a 2% administration fee, plus it generates additional surplus due to the scale of the program that can be used for the CEAP component.

The CEAP component will be offered to small and medium sized businesses and MURBs, which will engage the local business community effectively, showcasing the municipality's commitment to fostering thriving businesses by offering a program that has the potential to provide a better return on investment for building owners. Additionally, smaller businesses may lack the resources required to undertake building retrofits, the capacity and awareness of the technology and financial returns to decide on which investments to undertake and may even face uncertainties about their long-term business continuity, especially in highly competitive or volatile markets.

Compared to program A, with more buildings, there is a slightly higher risk of repayment defaults; however, defaults have been non-existent in HELP and Hi-RIS and are not prevalent in other studied programs. Liens, penalties, and alternative measures such as loan loss reserves will be explored to mitigate this risk if this pilot program is preferred.

The program assumes that 60% of a Sustainability Environmental Coordinator will be available to administer the program, this presents some risk including that a partial staff may not be available and more of the admin costs will fall to the program or that a larger time allocation is required. The CEAP component can be scaled up or down to mitigate this financial risk.

Providing a CEAP program for small and medium sized business and MURBs reduces the high cost of equipment replacements and offers a better return on investment for building owners.

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[88] U.S Environmental Protection Agency. Energy Efficiency Program Sponsor Frequently Asked Questions About ENERGY STAR Smart Thermostats (2023). Retrieved from https://www.energystar.gov/products/heating_cooling/smart_thermostats/smart_thermostat_faq

8.2.2.2 GHG Reductions

Program implementation in 50 buildings is anticipated to result in an emission reduction of up to 1,486 tonnes of CO_2e. The program is targeted to small and medium-sized buildings which currently represent 40% of GHG emissions (see Section 7.1.2.6). Therefore, the GHG reduction targets set forth in the LEC plan, will be met sooner than with Program A.

8.2.2.3 Potential Uptake

Based on the inventory of buildings that have business licenses in the city, there are nearly 7,500 ICI/MURB buildings in Saskatoon and small and medium-sized buildings (up to 3,000 sq m) represent 95% of the total stock (see Section 7.1.2.6). Although small and medium-sized buildings represent 95% of the total stock, the uptake risk for the program is considered moderate given that the targeted number of building retrofits for program B increases from 15 to 50 buildings.

8.2.2.4 Stakeholder Preference

Rebates that cover 30% or more of the total project cost were the most supported program instruments as indicated by the survey responses and through the in-person stakeholder engagement meetings as high costs were identified as the most significant barrier. However, loan financing was also of high preference by small, medium and MURB building owners.

8.2.2.5 Equity Consideration

Small and medium-sized businesses, non-profit, and MURBs often lack the capacity to participate in energy retrofit programs. Consequently, they cannot access support and the benefits of energy efficiency. The primary objective of this program would be to establish a program that incentivizes the participation of such businesses in loan financing. In terms of building size and GHG intensity, these businesses are smaller. When aggregated, they represent 95% of the ICI/MURB building numbers and business owners.

8.2.2.6 Compatibility With Existing Programs and What Other Jurisdictions Are Doing

The City, through HELP and in partnership with SaskPower on the EAP, provides financing, rebates, no cost items, and educational support for residential homeowners. This expertise can be used to develop C-PACE financing and CEAP for MURBs and small and medium businesses.

As explained in the best practice research section, there are other municipalities and provinces that have implemented CEAPs successfully.

8.3 ICI Program C - Full-Scale C-PACE Program for ICI/MURB Buildings

This program includes a full-scale C-PACE program open to the entire ICI/MURB sector including MURBs, businesses, large property owners, associations, and other building owners. The program would target 90 buildings. Over the course of the next decade, the program would aspire to scale up its impact, with the goal of benefiting up to 1,000 buildings. Program development will require approximately 1 year of planning and implementation and will run for three years.

Loans would be offered at flexible terms from 5 to 20 years at a rate equal to the City's borrowing rate. A 2% administration fee of the maximum eligible loan amount of $450,000 per building or ~$9,000 would be charged to each program participant to recover the cost to operate the program and the cost to offer an income-qualified component to the program.

Waived or reduced administration fees and rebates for energy audits would be offered to income-qualified or affordable housing MURB building owners.

Eligible upgrades would include energy and water efficiency upgrades such HVAC, lighting retrofits, building envelop improvements, low-flow fixtures, and renewable energy installations.

8.3.1 Financial Analysis

Table 9 below provides a cost breakdown of the financial analysis along with the assumptions used to conduct the analysis. The estimated total program cost is ~$40.9 million. This includes a loan capital cost of $40.5 million and an operating cost of $395,000 to administer the program.

Table 9 – ICI Program C - Financial Analysis

	Amount ($)	Assumptions
Funding		
Borrowing	$40,500,000	
Administration Fee Revenue	$810,000	$9,000*90
Total Funding	**$41,310,000**	
Costs		
Participant Loans	$40,500,000	
Operating	$335,000	Includes: Staff costs for Environmental Coordinator & Communications staff. Staffing cost includes a full time Environmental Coordinator, annually.
Contingency	$60,000	
Rebates	$415,000	Waived admin fees and audits for income qualified/affordable housing MURBs
Total Costs	**$40,895,000**	**Loan capital + Operating costs**

In this analysis, it is assumed that 1 full-time Environmental Coordinator is required to administer 90 buildings. A 2% administration fee of ~$9,000 could be charged to each participant to recover the operating costs and to offer an income-qualified or affordability component to the program. Alternatively, an administration fee of 0.98% or $4,389/building would be required to recover the cost to operate the program and not include the income qualified component.

Following the approach identified in Section 7.1.2.3, by adding an interest rider on top of the City's borrowing rate for the loans, additional revenue can be generated. With an interest rider of 1%, a surplus of ~$6M could be realized in 20 years. The surplus generated would be used to enhance and expand the program upon completion of the 3-year pilot program. However, this can also be a disincentive for participation and will be evaluate further during programs implementation plan design.

This program represents a bold step toward a more sustainable and energy-efficient future for the ICI/MURB sector. However, it also carries several risks.

8.3.2 Analysis Discussion

8.3.2.1 Financial Sustainability

ICI Program C requires more loan capital (~$40.9M) than programs A or B which may make it less favourable given the City's internal and external borrowing limits. The proposed program can be designed to be financially sustainable using a 2% admin fee, as with program B, plus it generates additional surplus due to the scale of the program that can be used to fund an income-qualified component.

Compared to programs A and B, program C has a higher risk of repayment defaults; however, the risk remains low and liens, penalties, and alternative measures will be explored to mitigate this risk if this program is preferred.

A full-scale C-PACE program offers a scale that allows for the optimization of allocated staff time and resources making it the most financially sustainable. However, there are limitations associated with internal and external borrowing.

8.3.2.2 GHG Reductions

The program implementation in 90 buildings is anticipated to result in an emission reduction of up to 13,685 tonnes of CO_2e at full build-out, assuming each building achieves a 20% reduction in GHG emissions[89]. The City could also mandate a certain level of energy efficiency or GHG emission reduction for buildings of a certain size to be eligible for the program.

8.3.2.3 Potential Uptake

Potential uptake risks exist with implementing a full-scale program targeting 90 buildings. Businesses may need years to plan buildings retrofits as many barriers exist and need to be considered when planning a building-as-a-whole retrofit such as budget constraints, when equipment reaches the end of life, resources, and lack of energy and water efficiency knowledge. Therefore, a 3-year program may hinder participant uptake in this program.

However, this program would be a full-scale project aiming to implement a C-PACE program for up to 90 ICI/MURB buildings per year. With this rate of intake, a substantial portion of ICI/MURB buildings will have implemented energy efficiency within 10 years. A C-PACE program could ultimately support up to 800-1000 buildings, while others will begin adopting energy efficiency as a market measure.

It is likely that mid to large buildings, due to their greater energy consumption, and environmental footprint, may be the first to participate in this program during the initial call for participation. These buildings, often pivotal in urban landscapes, have the potential to set an example and inspire broader changes within the ICI/MURB sector. While the specific criteria for participation in this program will be designed during the

[89] GHG emission reductions are calculated based on the estimated size (m2) of the buildings expected to participate in the program. Larger buildings contribute to increased GHG emissions reductions. Analysis completed in the 2024/25 Climate Budget was based on slightly different assumptions.

implementation planning stage, it's anticipated that they will prioritize factors such as building size, energy consumption intensity, and the scope of energy-efficient upgrades.

8.3.2.4 Stakeholder Preference

36% of survey respondents were somewhat to strongly interested in loan financing. Support for loan financing was mainly from the small, medium and MURB building owners. However, larger financing amounts between $100,000-$700,000 were requested by 20% of survey participants.

8.3.2.5 Equity Consideration

The full-scale C-PACE program will target the entire ICI/MURB sector and is not specific to any sub-sector. Due to efficiencies of scale, the program will have the capacity, using a 2% administration fee, to subsidize income-qualified or affordability components that could target small and medium business owners or MURBs.

8.3.2.6 Compatibility With Existing Programs and What Other Jurisdictions Are Doing

The program will build upon the success of HELP and will expand energy efficiency measures in ICI buildings and MURBs. As mentioned in the Section 7 - Program Instruments, two municipalities have initiated C-PACE programs. The project team will also build upon the success and lessons learned from these programs.

8.4 ICI Program D - No C-PACE Program; Implement Benchmarking, Labeling and Data Disclosure Program with a Dashboard.

In this program, the ESPM BLD tool along with an interactive dashboard will be implemented. This program provides an alternative to a financing program if funding is not available to support ICI programs A to C. Program development will require approximately 1/2 year of planning and the program will run for 1.5 years.

Unlike programs A to C, this is not a financing program. Instead, it includes the development of an interactive dashboard with visualization, reporting, and analytic enhancements for a BLD program through an interactive dashboard.

The interactive dashboard will serve as a public data portal, providing a map view, and ENERGY STAR score or certification and histograms that can be filtered to enable users to interpret and isolate data in multiple ways. It will also include clickable building summaries and case studies, highlighting sustainability projects.

8.4.1 Financial Analysis

Table 10 below shows a cost breakdown of the financial analysis along with the assumptions used to calculate each cost. The estimated total program cost for Program D is $395,000. This includes an operating cost of $259,000 to administer the program, and an additional $100,000 to develop, launch, host and maintain the BLD dashboard for two years.

Table 10 – ICI Program D - Financial Analysis

	Amount ($)	Assumptions
Operating Cost	$259,000	Includes: Staff costs for Environmental Coordinator, Project Manager, & Communications staff
Data Exchange	$20,000	Development of data exchange with SaskPower, SaskEnergy & SL&P Includes: Staff costs for IT.
Bi-Annual Platform Fee	$100,000	Estimated contractor cost
Contingency	$16,000	
Total Operating Cost of Program	**$395,000**	Sum of all program costs

8.4.2 Analysis Discussion

8.4.2.1 Financial Sustainability

Program D will not generate any revenue from administration fees to help the program achieve cost neutrality. Also, the program has a high implementation cost due to third party annual platform fees and operational costs.

8.4.2.2 GHG Reductions

No quantifiable GHG reductions will be realized from this program. However, it will serve as a tool to identify a baseline and drive future energy and water retrofit initiatives. BLD tools do not directly reduce GHG's but contribute to emission reductions in the long term as they help building owners identify opportunities for efficiency improvements.

8.4.2.3 Potential Uptake

BLD programs have been well-received in several municipalities and provinces. Inspired by the benchmarking program in Edmonton, the program could expect to have up to 200 buildings participating within 2-3 years with strong communication efforts, annual reports and highlights, and interactive dashboards to promote the program.

However, in the absence of incentives, program support and/or loan financing support, participation in this program is expected to be low which poses a risk to the program. Dedicated communication efforts and interactive dashboards will help promote the program and ensure that building data is continually contributed to the program year after year.

8.4.2.4 Stakeholder Preference

67% of stakeholders have shown interest in participating in a BLD program, as found from the survey and 100% from the one-to-one discussions. However, stakeholders expect incentives and support to participate in the benchmarking program.

8.4.2.5 Equity Consideration

Equity in BLD programs is achieved through inclusive data collection, community involvement, user-friendly tools like a dashboard proposed in this program, equity metrics, targeted efforts, and ongoing evaluation to address disparities.

8.4.2.6 Compatibility With Existing Programs and What Other Jurisdictions Are Doing

As mentioned under best practice research, the BLD programs have been successfully adopted on a voluntary and mandatory basis in several other jurisdictions.

8.5 Overall Suitability of ICI Pilot Programs

Table 11 provides a rating and assigns an overall suitability of the proposed pilot program considering the benefits associated with each of the overarching principles. Borrowing potential has been added to this table and were considered when evaluating the suitability of each program.

Table 11 - Overall suitability of Proposed ICI Pilot Programs for the City of Saskatoon

Overarching Principles	ICI Program A: Small-scale C-PACE Loan Program for MURBs	ICI Program B: Medium-scale C-PACE loan and CEAP Pilot Program for Medium Size Businesses, Non-Profits and MURBs	ICI Program C: Full-scale C-PACE Program for ICI Buildings and MURBs	ICI Program D: BLD program & Interactive dashboard
Borrowing Potential	High $6.9M Most likely to be funded through an internal loan.	Moderate $22.7M Moderately likely to be funded through an internal loan, may require external borrowing.	Low $40.9M Very unlikely to be funded through internal loan, may require external borrowing.	NA No revenue generation to pay back capital, not a loan program.
Financial Sustainability	Moderate 1.6% administration fee = $107K Recovers the operating cost over the term of loan.	Moderate 2% administration fee = $220K Recovers the operating cost over the term of loan plus $230K to offer rebates and no cost items.	High 2% administration fee = $395K Recovers the operating cost over the term of loan plus $415K for rebates or other programming.	Low No administration fee. $259K operating costs.
GHG Reductions (3-Year Pilot Program)	Low 592 tonnes of CO2e.	Moderate 1,486 tonnes of CO2e.	High 13,685 tonnes of CO2e.	Non-quantifiable No immediate reductions.
Uptake Risk (Building Retrofits)	Low/Moderate Number of buildings 15.	Moderate Number of buildings 50.	High Number of buildings 90.	NA No immediate retrofits expected.
Stakeholder Preference	Moderate Financing (PACE loans) favored by MURB and small and medium sized	High Most favored program due to rebates/no cost items. Financing	Moderate Financing (PACE loans) are the least preferred instrument as	High Third most favored program instrument due to a general lack of

	property managers and building owners.	(PACE loans) favored by all building owners.	larger building owners do not require loans and are interested in rebates to achieve positive paybacks.	energy and water efficiency knowledge and baseline data.
Equity Consideration	High Targets MURBs.	High Targets low-medium sized buildings, non-profits, and MURBs.	Moderate/High Depends on design, will include affordability component and/or income-qualified component.	Low No specific equity components/design.
Compatibility with existing programs and what other jurisdictions are doing	High City's HELP program. Toronto's Hi-RIS and TATR programs for MURBs.	Moderate/High City's HELP program. City/SaskPower EAP program. Many examples of CEAPs.	Moderate/High City's HELP program. Edmonton's CIEP program for the ICI building sector.	High 10 jurisdictions researched offer a BLD programs lead by the municipality.

9 Recommendation and Conclusion

9.1 Recommendation

In conclusion, it is recommended that:

1. ICI Program A, a small-scale C-PACE program for 15 MURBs be piloted, with the program to launch in 2025 and run for 3 years (until 2028), and
2. ESPM be implemented, with the free version of the BLD program to launch in 2025 and run for 1.5 years (until 2027).

If approved, program design and an implementation plan will be developed for a small-scale C-PACE program targeting 15 MURBs and the implementation of the ESPM tool.

ICI Program A will charge an administration fee of between 1.6% - 2% to each participant, to recover the cost to operate the program and if preferred an equity component will be integrated into the program during the design stage, which could include waiving administration fees and offering rebates and or no cost items to affordable housing MURB owners.

MURBs will be the targeted subsector for the program, as they showed the greatest support during engagement for both financing and BLD programs, and because they provide the greatest opportunity to further embed equity into the program. Moreover,

designing a program for the MURB subsector will allow energy and water savings to be passed on multiple tenants, targeting underrepresent communities throughout the City and helping to reduce the effects of energy poverty, while at the same time increasing occupant safety, comfort and building resiliency.

Energy efficiency measures in MURBs can also serve as pilots for similar ICI/MURB sector buildings with shared architectural and energy usage characteristics. For instance, a high-rise residential building with mixed-use features may have common architectural design and energy consumption patterns with commercial buildings like hotels or offices.

ICI Program A is recommended at this time, as it allows the City to build upon the success of HELP and expand energy efficiency measures to buildings within the ICI/MURB sector. Additionally, program A was identified to have the most combined financial, economic, and social benefits. ICI Program A is the financially sustainable program as it is the lowest cost program in terms of both loan capital and operating costs, and existing resources would be reallocated to administer the program. Furthermore, the program could potentially be funded through an internal loan, which makes it more favourable than the higher cost programs due to the City's limited borrowing capacity for additional external loans at this time.

Program A was also identified to have the least number of risks as compared to the other proposed program options. Due to its small scale, the risk of repayment default is considered very low to negligible, and the uptake risk is also minimized. Starting with a small-scale C-PACE program for 15 MURBs is less complex, requires less resources, and would allow for the opportunity to establish a strong base program that can be scaled in the future if the pilot program is successful.

Additionally, the program offers the potential to create local jobs within the construction and energy sectors and reduce up to 592 tonnes of CO_2e within the first three years. If successful, the program would be scaled to up to 1000 MURBs and similar ICI/MURB buildings to help the City achieve its net zero emissions target by 2050.

The implementation of ESPM is also recommended as BLD programs have been identified as essential tools that provide transparent data on energy use, identify inefficiencies, set baselines for improvement, inform policies, and encourage behavioral change, making them foundational tools in the effort to combat climate change. Furthermore, the implementation of ESPM is a critical first step in in understanding a building's energy performance, allowing for the disclosure of the ICI/MURB sectors building energy use, best practice sharing, and allowing for the City to monitor the existing building stock, which will ultimately inform future municipal policies and programs.

9.2 Conclusion

As the City continues its journey in reducing GHG emissions, it is important that improved building efficiency measures and renewable energy installations be considered for existing buildings. The research and analysis provided in this report outlines the optimal pathways for the City to facilitate the ICI/MURB sector to transition

to low emissions and net-zero buildings. Through the provision of financing, incentive, benchmarking, and capacity building programs that encourage the generation of renewable energy the City can progress its 2050 net zero GHG emission reduction targets while providing numerous other benefits for the businesses and residents in Saskatoon that live and work in ICI/MURB buildings.

10 References

Any relevant initiative documents or files are linked for easy reference.

11 Appendices

11.1 Appendix A: Triple Bottom Line Improvement Review

Triple Bottom Line Improvement Review

11.2 Appendix B: Final Engagement Report

Final Engagement Report