ONTARIO CLIMATE CONSORTIUM

Supported by Toronto and Region Conservation Authority

Designing a Property-Assessed Energy Retrofit Financing Program: Key Considerations for Ontario Municipalities

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Contents

1. Introduction

1.1. Report purpose

This report presents a set of key considerations for Ontario municipalities interested in moving forward with the development of a PACE – or Property-assessed Clean Energy – financing program to stimulate the uptake of building energy efficiency retrofits within their communities.

These key considerations have been developed through a cross-jurisdictional scan of existing property-assessed energy retrofit financing programs across Canada and the United States, as well as a facilitated risk management workshop with upper and lower tier municipal staff in the Regional Municipality of York.[1]

In Ontario, PACE financing is known as Local Improvement Charge, or LIC, financing. In this report we use the terms PACE and LIC interchangeably in reference to property-assessed energy retrofit financing programs.

The objective of this report is to identify the challenges and lessons learned, explore best practices, and clarify the potential risks and mitigation options for Ontario municipalities when developing such programs. The report represents phases 1 and 2 of a broader project to explore the feasibility of developing a PACE financing program in the City of Vaughan, within the Regional Municipality of York in Ontario, Canada. Table 1 below provides an overview of these different phases and the associated project deliverables and objectives.

[1] Ontario municipalities may be **single-tier** (e.g., Toronto, Hamilton, Barrie) or two-tier. In the latter category, the **upper tier** is either a county or a regional municipality (such as York). An **upper-tier municipality** is one formed by two or more **lower-tier municipalities**. Municipal responsibilities set out under the *Municipal Act* and other Provincial legislation are split between the upper-tier and lower-tier municipalities. A **single-tier municipality** is one that does not form part of an upper-tier municipality for municipal purposes and assumes all municipal responsibilities set out under the *Municipal Act* and other Provincial legislation.

Table 1 City of Vaughan Property-assessed Clean Energy Finance Feasibility Study - Project Overview

Phase	Deliverables and Objectives	Timeline
1) Synthesis Report	• Through research on existing PACE programs in North America, develop a synthesis of design options, trade-offs, and risk mitigation opportunities for local governments.	June 2019
2) Design-thinking workshop	• Conduct design-thinking workshop with municipal staff to understand risk profiles and mitigation options associated with various program designs. • Collaboratively develop a risk profile, and mitigation options, for a set of PACE program models in the York Region municipal context, including upper tier/lower tier governance and financing issues	
3) Developing Municipal LIC toolkit	• Develop a municipal toolkit - including generic by-laws and administrative policies, procedures and protocols, as well as a comprehensive risk assessment and mitigation plan – to increase the capacity of the City of Vaughan and partner municipalities to develop and implement a PACE financing program	December 2019
4) Model by-law	• Draft a by-law for Council consideration that would enable a PACE financing program in the City of Vaughan.	

1.2. Background context

Through the Paris Agreement, Canada has joined 195 Countries in committing to keep global temperature increases to below 2°C to avoid the most catastrophic impacts associated with climate change. To achieve this, Canada has committed to reducing emissions by 30% below 2005 levels by 2030, and to achieving a zero-carbon economy by mid-century.

In Ontario, the largest emissions sources are road transportation and buildings (residential, commercial and institutional), which represent 65% of total energy-related GHG emissions in 2016.[2] Road transportation and buildings are emissions sources which Ontario municipalities have a fair degree of influence over through planning and policy tools.

Within the building sector, energy-related GHG emissions are generated by residential and commercial buildings, and largely relate to thermal energy demand (particularly natural gas). As figure 2 shows, building sector emissions are dominated by single-family home sub-sector (detached, semi-detached, and townhouses), which make up half of total emissions.

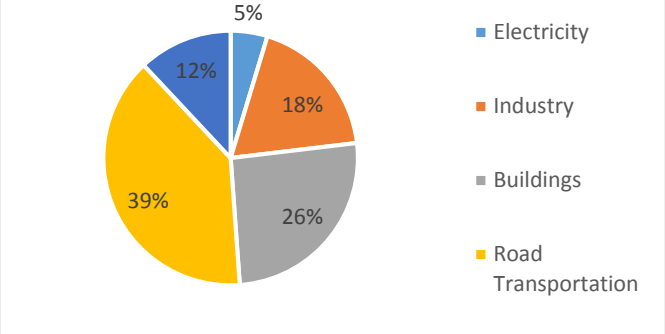


Figure 1 Energy-related GHG emissions in Ontario, 2016 data

Within the residential sector the potential benefits associated with reducing energy and emissions consumption is significant. Residential buildings account for more than 20% of the province's total annual energy consumption, at an annual cost to Ontario households of more than $12 billion per year.[3] Residential building sector emissions within York Region municipalities are higher than the provincial average, representing between 30-40% of energy consumption and similar proportion of emissions in the City of

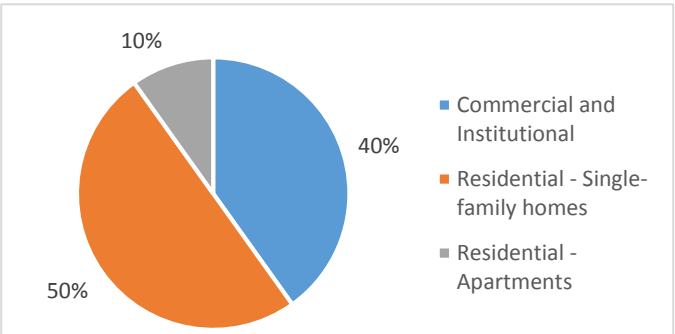


Figure 2 Building Sector GHG emissions by building type in Ontario - 2016 data

[2] Environment and Climate Change Canada (2018). *National Inventory Report 1990–2016: Greenhouse Gas Sources and Sinks in Canada.*
[3] *Ibid* and Financial Accountability Office of Ontario (2016). *Home Energy Costs in Ontario*. FAO calculates that the average household spends $2358 per year on home energy costs. NRCan database shows that there are 5,322,000 households in Ontario.

Vaughan, Markham and the Town of Newmarket. To contribute to meeting the Federal Government's targets under the Paris agreement will require at least 60% to 90% of existing homes to have relatively comprehensive energy efficiency retrofits by 2050.[4] In a typical city of 100,000 population, this translates to 800 to 1,200 home retrofits per year for 30 years, or 70 to 100 retrofits per month. A program of this scale would generate about $20-30 million of annual economic activity.

Municipalities in York Region have identified existing residential building retrofits as one of the greatest opportunities for achieving a low carbon future. York Region's Official Plan calls for area municipalities to "encourage retrofitting of existing buildings within the Urban Area and within Towns and Villages".[5] Municipal and Community Energy Plans completed by lower-tier municipalities in York Region, namely the Town of Newmarket, the City of Vaughan, and the City of Markham have all indicated that addressing the energy performance of the existing residential building sector is a high priority. For example, Newmarket's Community Energy Plan sets a target of retrofitting 80 percent of the Town's approximately 24,000 existing homes by 2031 with efficiency gains of 30 to 50 percent per dwelling. All three of these energy plans identify a local improvement charge mechanism as a key municipal policy lever to complement existing retrofit incentives that may be available from other levels of government and energy utilities. Furthermore, these energy plans recommend as a short-term action the determination of the best approach to implement a residential energy efficiency program.

[4] A comprehensive whole-house energy efficiency upgrade can reduce annual energy consumption by 15-30% and reduce annual GHG emissions by 60% or greater.
[5] York Region (2010). *Official Plan, chapter 5*.

Table 2 York Region Municipal Residential Sector Energy Conservation Objectives

Municipality	Residential Energy (% of total)	Residential Emissions (% of total)	Reduction Objectives and Targets
York Region	Data not available	Data not available	Encouraging energy and water efficient…retrofits such that buildings can contribute to energy efficiency and water management Encouraging initiatives that move toward zero greenhouse gas emissions by 2051[6]
City of Markham[7]	34	27	Emissions reduction target of 30% of electricity use and 40% heating energy use by 2030 (2011 baseline)
Town of Newmarket[8]	38	39	Retrofit 80 percent of the approximately 24,000 existing homes by 2031 with efficiency gains of 30 to 50 percent per dwelling. 100 percent compliance with applicable OBC for new build.
City of Vaughan[9]	37	35	GHG reductions from deep residential retrofits of the over 80,000 ground-related dwellings identified as an opportunity requiring further exploration. Emissions reduction target of 13,700 tonnes CO2 per year by 2031 (based only on updated conservation and demand management programs of utilities).

[6] Regional Municipality of York (2011). *Vision 2051.* Pages 26-27. Available online.
[7] City of Markham MEP (2018).
[8] Town of Newmarket Community Energy Plan (2016).
[9] City of Vaughan Municipal Energy Plan (2016).

1.3. Residential sector energy efficiency market failure

Residential energy efficiency has historically posed a paradox for policymakers – particularly in the single-family home sub-sector. Despite the value proposition for individual homeowners, and society in general, most homeowners have yet to implement energy efficiency upgrades in their home. There are behavioural and psychological barriers which prevent recognition and/or interest in energy savings opportunities or home renovation, as well as market barriers which prevent uptake even when a homeowner is aware and interested. There are a number of market barriers that have been identified as particularly significant[10,11]:

1. **Challenges related to the quantification of savings -** Energy efficiency is "counter-factual; in other words, energy savings reflect what would have happened in the absence of the retrofit and so cannot be measured directly.
2. **Insufficiently compelling value proposition –** due to relatively low cost carbon-based fuel sources (e.g. natural gas), energy savings from retrofits (e.g. $50 to $150 per month) are often not compelling enough to convince the owner to spend disposable income on an energy upgrade rather than a vacation or a kitchen remodel.
3. **High upfront costs -** payment for energy upgrades is required up front, whereas the payback occurs over a period of years, even decades. Financing is an obvious solution, but a significant number of homeowners do not have access to credit, or at least access to affordable credit.
4. **Contractor delivery system challenges –** In some markets, the supply of contractors, energy auditors, and other qualified professionals is limited. Contractors have difficulty charging prices that make entry to the residential energy efficiency market attractive because of high transactional costs. Contractors have also been dissuaded from entering the market because of the complexity of retrofit programs with multiple players (government, utilities, etc.) and arduous data collection requirements and/or difficult-to-use modeling tools, which add to the time and cost of the job.
   High household debt levels – In spite of an attractive business case, high debt levels may make it difficult to access traditional financing.

Addressing the upfront costs of energy retrofits for homeowners is one of the most significant ways in which local government policymakers can drive residential energy efficiency and emissions reductions. Residential energy upgrades help make housing more affordable for residents, create jobs for local contractors, and help

[10] State and Local Energy Efficiency Action Network (2015). A Policymaker's Guide to Scaling Home Energy Upgrades. Prepared by Robin LeBaron and Kara Saul-Rinaldi of the Home Performance Coalition.
[11] Energy and Mines Minister's Conference (2016). Financing Energy Efficiency Retrofits in the Built Environment. Available online.

achieve GHG emissions reduction targets set by governments. To achieve these savings, however, the homeowner must pay for the energy efficient upgrade measures (HVAC, insulation and air sealing, etc.) up front.

The two most common sets of policies that governments implement to address upfront costs are:

- **Incentives to bring down the cost of the project.** These take the form of:
  - Tax credits/deductions—either a tax credit or deduction in income tax liability for installation of energy efficiency measures or a temporary elimination of sales taxes.
  - Rebates for the purchase and installation of energy-efficient products, equipment, systems, and appliances.
- **Access to low-cost capital.** This includes:
  - Financing programs that enable access to capital through secured or unsecured loans, which may be repaid through conventional means or through innovative mechanisms such as on-bill financing through energy utilities and the use of property assessments in Local Improvement Charge (LIC) programs, also known as Property-assessed Clean Energy (PACE) programs.

LIC/PACE programs are a financing policy tool uniquely available to local governments in jurisdictions with enabling legislation in place. Enabling legislation is in place in 33 states covering Roughly 80% of the U.S. population. In Canada, enabling legislation is in place in Alberta, Quebec, Ontario, Prince Edward Island and Nova Scotia.

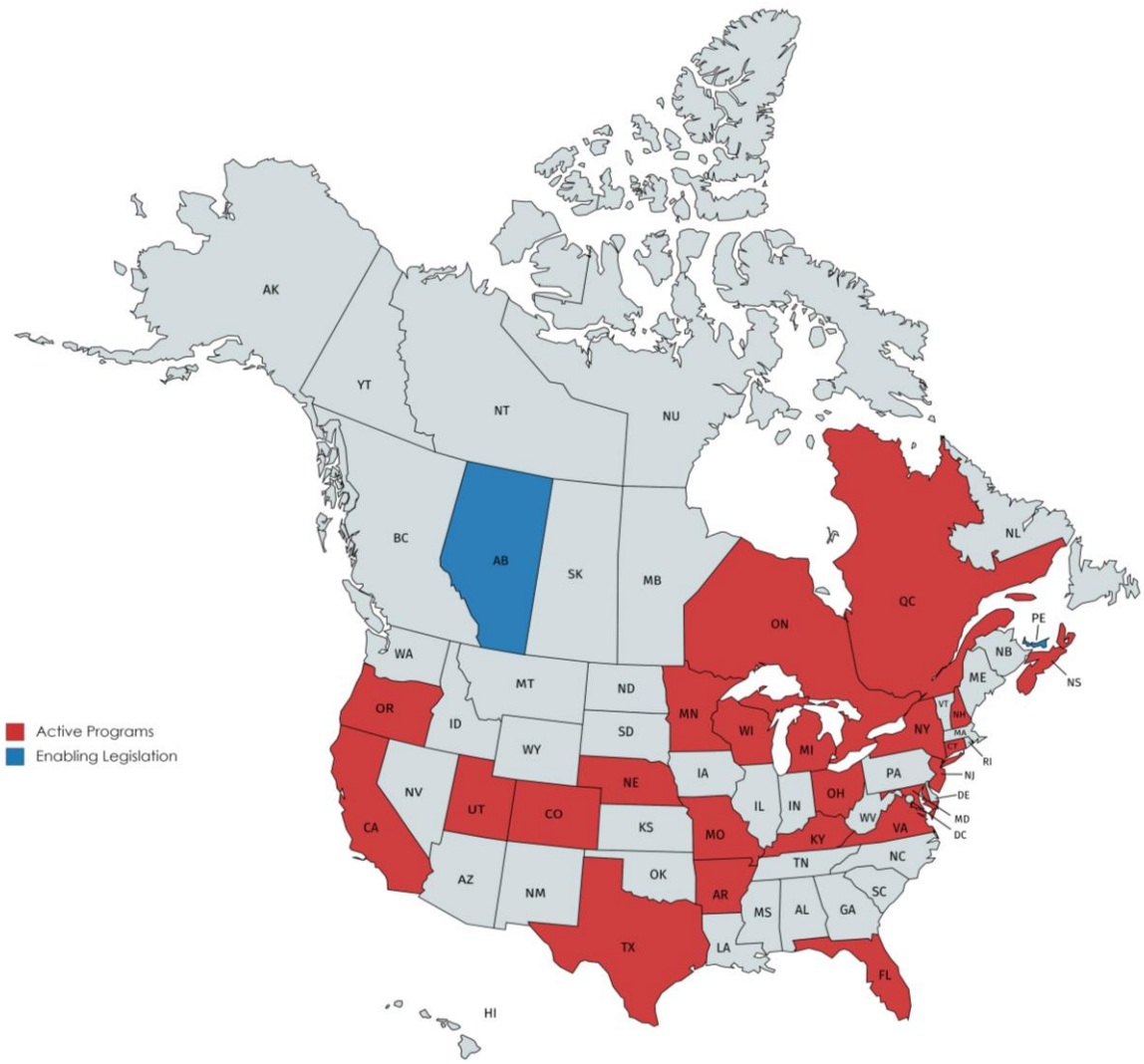


Figure 3 Provinces and states with PACE enabling legislation and/or existing programs (OCC, 2019)

While this report focuses on addressing the upfront capital barrier through financing tools, research indicates that it is critical to complement financing programs with other tools in collaboration with delivery partners - most notably energy utilities. Financing has been most effective when used in conjunction with other tools (e.g. advice, grants/rebates, mandatory information such as labeling) to address the range of barriers that homeowners and building owners face in undertaking efficiency retrofits.

1.4. LIC Financing in Ontario

Ontario's Municipal Act permits municipalities to pass a by-law to undertake works as a local improvement, and to raise all or any part of the cost of the work by imposing special charges on lots that abut on the work and/or will be directly benefited by it.[12] In the past, LIC charges have mostly been imposed for upgrading local infrastructure such as sewers and sidewalks.

In 2012, the Ontario government amended the existing LIC regulations under the Ontario Municipal Act, 2001 (O.Reg. 586/06) and the City of Toronto Act, 2006 (Government of Ontario, 2012) to permit municipalities to enter into voluntary LIC financing agreements with individual property owners. The regulation was scoped to energy and water saving measures, and renewable energy systems on private properties and enabled municipalities to impose a special charge on the lots of consenting property owners to facilitate repayment via property taxes.[13] One of the unique characteristics of the LIC financing tool is that due to its status as a special charge on the tax lien, LIC assessments stay with the property when it is sold, rather than with the former owner. This helps to overcome the barrier of high upfront costs; and is also the only approach that offers long-term financing at an attractive rate that aligns with the typical payback periods for deep energy savings projects. The long amortization period addresses homeowner risk that the payback period for their efficiency investment is longer than the time they remain (or intend to remain) in the home.[14] The LIC mechanism also addresses lender (public or private) repayment risk, as it becomes no worse than the municipality's average property tax default rate.

Shortly after Ontario passed its LIC enabling legislation, the City of Toronto launched a Residential Energy Retrofit Program in 2014, which provided financing to support property owners in undertaking energy and water conservation improvements.[15] The Program operates as two financing streams: The Home Energy Loan Program (HELP) for eligible single-family homes; and, the High-rise Retrofit Improvement Support Program (Hi-RIS) for multi-unit residential buildings. While other municipalities across Ontario have expressed interest in utilizing the LIC mechanism to support a local residential home retrofit program, a lack of familiarity and concerns from Council and Staff about financial and other risks associated with operating such a program have thus far prevented others from moving forward.

This report is focused on assessing risks to local governments and identifying key program design considerations to mitigate these risks while enabling program scale-up.

[12] Dunsky Energy Consulting (2013). CHEERIO Working Group: LIC Financing Pilot Program Design.
[13] Dunsky Energy Consulting (2013). CHEERIO Working Group: LIC Financing Pilot Program Design.
[14] Ibid.
[15] City of Toronto By-Law No. 1105-2013. https://www.toronto.ca/legdocs/bylaws/2013/law1105.pdf

2. Cross-Jurisdictional Scan of LIC Program Parameters

This section of the report presents an analysis PACE programs across North America and reflects on the key lessons learned from program implementation. This research is intended to help to shape the parameters, internal logistics, program criteria, and other varying details of the LIC framework to be proposed for implementation in the City of Vaughan and York Region.

For this report, authors conducted document reviews of publicly available information, as well as interviews with program sponsors and administrators representing the following programs shown in figures 4 below:

Figure 4 Jurisdictions Reviewed for Cross-jurisdictional Analysis (OCC, 2019)

This cross-jurisdictional scan of PACE programs is organized around a framework of key program design parameters shown in table 3 below. This framework has been adapted from the "*Lessons in Commercial PACE Leadership*" report published by the United States Department of Energy.[16]

Table 3 PACE Design Parameters

	Main Category	Key Parameters
Stage 1: Enabling	1.1 Enabling Legislation	• State/provincial legislation
	1.2 Municipal policy and by-laws	• Municipal by-laws • Business case rationale
Stage 2: Program Foundation	2.1 Program Administration Model	• Decisions around program operating model • Roles and responsibilities for organizations involved in program administration (municipality, third-party organization, etc.)
	2.2 Financial Management and project capitalization	• Project capitalization • Credit enhancements • Interaction with existing incentives
	3.1 Program qualification requirements	• Eligible property types • Eligible owners and projects
	3.2 Program evaluation	• Energy audit guidelines • Documenting energy savings
Stage 3: Program Set-up and Operations	3.3 Ongoing operations tasks/ costs	• How program operational costs are recovered • Administrative processes • Quality assurance/ quality control • Legal fees
	3.4 Stakeholder engagement	• Stakeholder identification • Stakeholder engagement process
	3.5 Program Marketing	• Primary marketing techniques

[16] U.S Department of Energy (2018). Lessons in Commercial PACE Leadership.

Stage 1: Enabling Legislation and Municipal By-Laws

1.1 Enabling Legislation

The basic function of provincial/state legislation is to enable property-assessed financing for energy retrofits within the jurisdiction. The legislation typically provides a high-level policy framework by setting out some limited aspects of program design, such as property types and eligible measures.

At a minimum, enabling legislation sets out the role that a municipality must play to enable property-assessed energy retrofit financing at the local level, such as adding a special charge on the consenting property. In Ontario, the enabling legislation permits municipalities to pass by-laws for the use of LICs on private properties to support energy efficiency, water conservation, and renewable energy retrofits. The legislation also provides for priority lien status of LIC assessments. Beyond defining the LIC assessment, its seniority on the property title, and the types of measures that are eligible, the enabling legislation is broad in that it doesn't prescribe what types of entities can be made responsible for establishing and operating a retrofit financing program, or how such programs can be structured or capitalized. This leaves important program development decisions to the local and regional level to be addressed in municipal by-laws and subsequent program design decisions.

PACENation, a US-based advocacy group, has developed recommendations for key elements to include in enabling legislation.[17] Some of those key recommendations are compared to Ontario's enabling legislation in table 4 on the following page.

[17] PACENation (2018). *Model Clauses Checklist.* Accessed online May 10,2019: https://pacenation.us/wp-content/uploads/2018/10/Model-Clauses-Checklist-.pdf

Table 4 Comparison between Recommended PACE Legislation Elements and Ontario LIC Regulation[18]

Recommended PACE Legislation Elements	Ontario LIC Regulation (O.Reg 586/06)
State the public purpose goals that PACE helps achieve (e.g. energy conservation, avoided costs, environmental concerns, economic development)	Clause 1(2)(b) - Water conservation Clause 1(2)(q) - Energy efficiency and renewable energy
Allow local governments offering PACE to do so in concert with others	Clause 32(1) – agreement between municipalities re joint local improvement
Allow programs to be administered by 3rd party providers	Not included – not strictly forbidden
Allow programs (government sponsors) to charge fees to offset program administration costs	Clause 12(2).2 The following may be included in the cost of a work…reasonable administrative costs, including the cost of advertising and of giving notices.
Specifies repayment mechanism, and that payments should not exceed the life of the improvement	Clause 30 describes special assessment, and that annual payments shall not exceed the life of the retrofit improvement
Indicate PACE program funding options	Not included – clause 34 indicates how to apply reserve fund for long-term debt

[18] Adapted from Dunsky (2016). Ontario Municipalities Local Improvement Charges Programs for Energy Upgrades Update Study. Accessed online May 10,2019: http://www.cleanairpartnership.org/wp-content/uploads/2016/10/CAP-LIC-Update-Study-Report-2016-05-31.pdf

1.2 Municipal by-laws

After a state/province has passed enabling legislation, local governments who wish to opt-in may pass an enabling by-law. While such a by-law may simply authorize the undertaking of energy works on private property, it is common for such by-laws to also stipulate the sector of focus be it residential, commercial or both. It is also common for enabling by-law to be accompanied by a business case / program rationale describing how the program will function.

As stated above, in the Ontario context there are critical program architecture decisions left to municipalities which need to be addressed as part of the development of a by-law and business case. These decisions include:

1. Program legal structure
2. Operational leadership and governance
3. Capital structure

Furthermore, depending on the program architecture decisions made above, the initial business case may also include specifications around:

1. Program qualification guidelines (including eligible property types)
2. Program evaluation

Each of these sets of decisions will be discussed in the following sections, **Stage 2: Program Foundation, and Stage 3: Program Set-up and Operations**.

Stage 2: Program Foundation

The enabling legislative framework typically provides some level of direction around program guidelines, but often much is left to the program sponsor (e.g. local government) to decide. This is particularly the case in the Ontario context, where the enabling legislation does not provide direction on:

- legal structure for a municipal retrofit program,
- operational leadership and governance,
- capital structure,
- qualifying properties and
- evaluation requirements

This section provides a synthesis of research on these foundational elements of PACE programs, and outlines the options available to Ontario municipalities.

2.1 Program Administrative / Legal Structure

Given that Ontario's enabling legislation has not provided for the establishment of a province-wide program at this time, interested municipalities have several options to consider in deciding how to structure an LIC-based energy retrofit program. There are two main categories of these program administrative structures: municipal stand-alone model or a multi-municipal collaborative model:

Administrative Structure

Municipal stand-alone model: The program operates solely within the jurisdictional boundaries of a municipality, as in the case of the City of Toronto's HELP and Hi-Rise program. These stand-alone municipal programs are typically found in larger urban municipalities that have enough market demand to support the administration and marketing costs associated with program delivery.

Multi-municipal collaborative model: Interested municipalities can collaborate to develop a model that operates across jurisdictional boundaries. This model is common in California. Opting-in to a larger program offers standardization in terms of program features, which can be beneficial for program stakeholders. It is also a model that has been effective for enrolling smaller municipalities in PACE programs. It allows them to join as a member with little or no cost or administrative burden.

Legal Structure

Initial decisions around administrative model lead to decisions around the legal structure for the retrofit program. In the case of a stand-alone program, the municipality can design and administer the program itself with in-house staff and resources (e.g. City of Toronto).

Whether going it alone, or in a multi-municipal collaboration, the option to outsource program design decisions and some key administrative functions to an arms-length Municipal Services Corporation or a fully independent organization can provide access to outside program design expertise and efficiencies in operations and governance. For example, interested municipalities can establish a joint-share Municipal Services Corporation with partner municipalities, as many California municipalities have done using that State's Joint Powers Authority model, or through a cooperative procurement agreement, participating municipalities can contract with an independent program administrator.

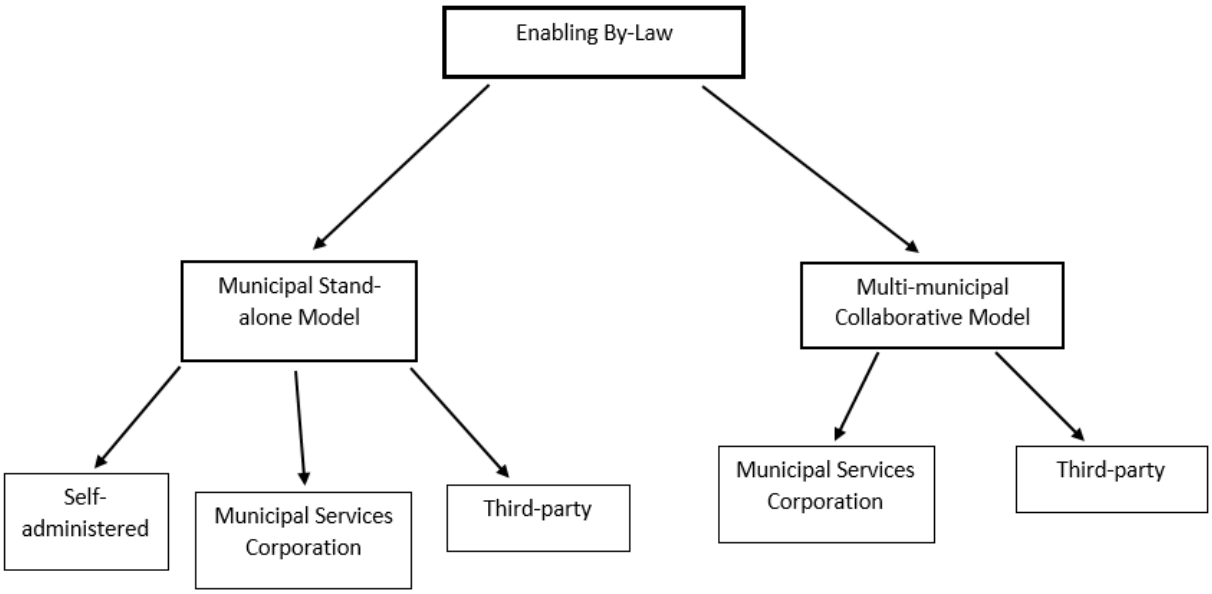


Figure 5 Decision tree highlighting program administration model options (OCC, 2019)

It is important to note that decisions on administrative and legal model are not necessarily static. A municipality may choose a standalone self-administered model initially to build experience and early success with the intent to migrate to an outsourced multi-municipal model in a later phase. Such a strategy could be outlined in the business case that is developed to support the development of an enabling by-law.

2.2 Financial Management and Capitalization

Program Initialization and Capitalization

For the initial stages of program design and implementation, public funding in the form of grants and subsidies are often used. For example, in Canada, funding from the Federation of Canadian Municipalities and Natural Resources Canada have been used to finance feasibility studies and pilot projects. In the United States, several PACE programs were established with funds under the American Recovery and Reinvestment Act stimulus package released in 2009.[19] The Department of Commerce and the Department of Energy has also provided grants to fund programs across the states.

Municipal reserve funds have also been used to launch pilot programs, such as the City of Toronto which committed $20 million in 2014 to launch HELP and Hi-RIS. About half of the $20 million had been committed as of March 2018,[20] and City staff managing the program have indicated an increasing level of interest amongst homeowners and multi-unit residential building owners. Moving beyond pilot program stage to achieve the scale of retrofits required to meet deep emissions reductions requires a commensurate scaling-up of program capitalization by leveraging private sector sources of capital.

Depending on decisions made regarding program administrative and legal structure (see 2.1), PACE programs can leverage private capital either through bond or direct funding.

Bond Funding - If a municipality chooses the self-administered model, or a municipal services corporation model, a bond funding approach can be appropriate. For example, the City of Toronto is considering the transition to a private sector funding approach with its Green Debenture Framework which has designated property-assessed energy financing as eligible.[21] The City's inaugural green bond offering of $300 million is an indication of the financing scaling potential of transitioning from a public to private financing approach.[22]

Under a bonding model, revenue bonds issued by an authorized entity, such as a local government or a municipal services corporation are used to capitalize a PACE program. Bond obligations are paid back through the LIC payments remitted by the property owner to the municipality. The municipal services corporation model provides the opportunity for PACE program debt to be off-balance sheet from the perspective of the municipality, which may address concerns raised about municipal debt limits in Ontario.

[19] Dunsky Energy Consulting (2013). CHEERIO Working Group: LIC Financing Pilot Program Design.
[20] City of Toronto (2018). Home Energy Loan Program and High-rise Retrofit Improvement Support Program Update.
[21] City of Toronto (2019). Green Debenture Framework.
[22] https://wx.toronto.ca/inter/it/newsrel.nsf/7017df2f20edbe2885256619004e428e/1023e42ae9365fae852582ce0069f953?OpenDocument

However, these concerns appear over-stated as municipal debt obligations in respect of the owner's share of the cost of a work undertaken as a local improvement do not count towards the municipal debt limit.

Direct Funding - In US PACE programs, where the independent administration model is common, direct funding is the most prevalent approach. Under this approach, capital for projects is raised directly from capital providers (i.e., lenders). The lender's investment in a PACE project is secured by a financing agreement giving it the right to receive loan repayments from the assessment on the property. In US PACE programs, private lenders have typically not been interested in smaller residential scale projects which is why commercial PACE has seen greater growth. Such smaller projects have been funded in Connecticut by the state's Green Bank and by small, private community development financial institutions, and other nonprofit institutions in select markets. In the Ontario context a Direct Funding approach is applicable to both an arms-length Municipal Services Corporation model and an independent entity model.

Credit Enhancements

Notwithstanding the low rate of default on municipal property taxes and LIC loans, several existing US PACE programs have established credit enhancement tools for their programs which offer lenders protection against losses if a borrower defaults or is delinquent on payment. These include:

Loan Loss Reserve Fund (LLR)– a pool of funds that lenders can tap to recover a portion of losses in the event of a default. For example, the California State Treasury created a $10M LLR to cover first mortgage lenders for any losses as a result of the PACE lien. To date, 146,311 residential PACE financings valued at about $3.3 billion are covered by the LLR, and not a single claim has been made against it. During Program development, it was initially estimated that the LLR would last between eight to twelve years, however the program currently working with technical advisors to help determine the potential long-term liability and longevity based on activity to date.[23]

Debt service reserve fund (DSRF) – a pool of funds to cover a lender when a borrower is delinquent on payments. Once a payment is made, funds are returned to the DSRF. San Francisco, for example, offers a DSRF equal to 10% of the assessment, made possible through an earlier federal grant.

Programs may build up reserves for credit enhancements through fees charged on each PACE transaction, while others use grant funding. Administrators of municipal self-financed programs could use these reserves as a tool to encourage retrofits in the non-profit housing sector, and more generally to manage the risk of

[23] California Alternative Energy and Advanced Transportation Financing Authority (2019). *Property Assessed Clean Energy (PACE) Loan Loss Reserve.* Accessed online: https://www.treasurer.ca.gov/CAEATFA/pace/activity.asp

delinquency or default on the PACE obligation. If using a private sector lending model, these tools can be used to help lenders to offer long term financing and/or low interest rates.

Interaction with Existing Incentives

PACE programs typically engage with utility companies in the program foundation stage to align financing with available rebate/incentive programs. In the case of Connecticut's CT PACE Program, the Green Bank works cooperatively with other government and utility partners which have incentive programs for energy efficiency and renewable energy projects. The Green Bank factors in incentives/rebates into the project costs, with the remainder financed by the program.

During the initial stages of the City of Toronto's HELP program setup and launch, staff partnered with utility companies that offered incentives, including the Independent Electricity System Operator (IESO), Toronto Hydro, and Enbridge Gas. Both the HELP and Hi-RIS programs collaborated with Enbridge Gas to integrate with existing incentives offered by the gas utility, in addition to cross-promotion and project support. By maximizing use of utility grants/incentives, applicants free up more of the loan to take on deeper retrofits.[24]

[24] City of Toronto (2017). Home Energy Loan Program and High-rise Retrofit Improvement Support Program Evaluation.

Table 5 Retrofit Program – Program Foundation Key Considerations

Admin Model	Legal Structure	Operational Leadership and Governance	Capital Structure
Self-administered (standalone model)	N/A – in this model there is no separate legal entity to administer the program. A division or department within the municipality with a specific mandate and staff expertise would be established. This would result in a more centralized authority but would also require additional resources for staffing and operational functions.	City staff provide operational leadership Governance is provided directly via municipal Council	• Municipal capital reserve funds • Debt finance (debentures) • Senior government loans and/or grants
Arms-length Municipal Services Corporation (standalone or multi-municipal model)	Established under Section 203 of the Ontario Municipal Act, 2001 MSC is incorporated under corporation acts, such as the Ontario Business Corporations Act.	MSC has a separate board and management structure from the municipality. Municipal Council(s), as shareholder(s), will be responsible for appointing the Board of the corporation – which could include staff, councilors, community members - providing additional overall influence on the corporation The municipality(ies) as shareholders of the corporation, may use a shareholder's declaration to establish overriding policy to be followed by the board and can restrict the board's scope of authority, to the extent desired by the municipality(ies)	Can be incorporated as either a share corporation, or a non-share corporation. A share corporation model has the advantage of providing an initial asset base to leverage through the issuance of bonds/debentures which are secured against the assets of the corporation
Independent Delivery Model (standalone or multi-municipal model)	Share capital corporation under the *Business Corporations Act 2017* **OR** Multi-stakeholder Co-operative under the *Co-operative Corporations Act* **OR** Non-share capital corporation under the *Not-for-Profit Corporations Act, 2010.*	Independent governance and management structure for operations	• Private capital (e.g. performance contracts) • Revenue bonds

2.3 Program Scope

In the foundation stage, a business case typically outlines the overall scope of the program in terms of which properties types and retrofit measures qualify.

Eligible property types

Enabling legislation often covers both residential and commercial properties, with only a few designating industrial properties. In the case of Ontario's enabling legislation, there were no stipulations as to which property types are eligible, which leaves that decision to the local level. A legal opinion obtained by the cities of Guelph and London concluded that LICs can be used for energy retrofits on all types of buildings except buildings owned by municipalities and their local boards.[25] The City of Toronto's PACE program is focused on residential properties, as are the active programs in Nova Scotia.

Various US states have PACE enabling legislation that covers both residential and commercial properties. However, residential PACE activity is focused in California with few active residential programs in other states. This is partly due to concerns expressed by residential mortgage lenders which California has mitigated with the LLR discussed in section 2.2.

Commercial programs differ from their residential counterparts in that they have a lower number of participants and involve significantly larger transactions per project. They often involve complex retrofit measures and can invest to a larger degree in professional design and planning services, such as applying the widely recognized ASHRAE procedures for commercial building energy audits. In addition, commercial property owners are arguably more sensitive to the cost-effectiveness of a retrofit project compared to residential homeowners. The business case and marketing strategies for PACE financing can therefore differ significantly between residential and commercial target groups.

In addition to deciding on eligible property types, municipalities may establish criteria or stipulations within their enabling by-law or business case to target specific neighbourhoods for property-assessed financing. For example, the City of Toronto's LIC by-law outlines an outreach and building selection process that aims to focus programs in areas with '*a concentration of buildings with a preponderance of residents with low-incomes*', as well as buildings that are older than 1980 in order to maximize outcomes aligned with city objectives.[26] Nova Scotia's enabling regulation within the Halifax Regional Municipality Charter identifies properties situated within the (as yet undeveloped) Cogswell District Energy Systems service area as

[25] Guelph Energy Efficiency Retrofit – Report to Council http://guelph.ca/wp-content/uploads/council_agenda_052416.pdf#page=125
[26] City of Toronto LIC by-law.

eligible for financing to connect to the District Energy Network.[27] This financing incentive would be coupled with a requirement for new development within the redevelopment area to connect to the prospective district energy system.

Eligible owners and projects

Broadly speaking, program requirements for building owner and project eligibility tend to fall into a few general categories of requirements. Some requirements may be laid out in the enabling by-law/business case. For example, the program verifies that the building is in the special assessment district and confirms the applicant is legally eligible to participate in the program. Requirements for qualifying building owners can include:

Consent: Most PACE by-laws outline requirements for mortgage lender consent if the property is subject to one or more mortgages. One exception is the Clean Energy Financing program in Nova Scotia which recommends, rather than requires, that homeowners notify their mortgage lender about their participation in program. During the initial program design process, mortgage lenders were consulted with and an internal legal discussion was conducted to address lender concerns. To date, the Clean Foundation has not encountered any bank putting their client in a default position and it has not impacted program uptake.

Best practices in requesting lender consent include providing lenders with:

- Standard request forms with supporting documentation (e.g. project summary, improvements, estimated savings
- Borrower statistics (loan-to-value, debt service coverage ratio)
- Energy audit results
- Program overview, including summary of enabling legislation

Ownership: All owners of the property must consent to the arrangement

Current on obligations: This can include property taxes, utility bills, etc.

Financial limitations: including debt-service ratio, combined loan to value ratio, and assessment to value ratio.

- For example, the energy savings to debt ratio for the Town of Bridgewater (and most other programs) is set at 1:1 or greater, which means that the total savings from any

[27] A district energy (DE) system supplies thermal energy to multiple buildings from a central plant or from several interconnected but locally-distributed plants. Thermal energy is conveyed through pipes to end users using water or steam. DE systems can achieve significant energy efficiency gains for buildings/homes, which translates to reduced operating costs, as there is no need to import fuel.

energy improvements to a home paid for through PACE financing must be equal to, or greater than, the total cost of the improvements to that home including labour and materials, administrative fees, and interest accrued. In other words, the combined package of upgrades must pay for itself within the timeframe of the financing period (10 years).[28]

- Clean Foundation's PACE loans "may not exceed 15% of the assessed value of the Customer's Property" and the loan has to be paid back within 10 years at a four per
- cent interest rate.[29]
- The City of Toronto for example, sets a maximum financing amount as 10% of the assessed value of the property.

Expected savings: some PACE programs include stipulations that projects demonstrate energy savings over a certain threshold, and/or that the term of the assessment not exceed the useful life of the project. Some programs encourage or require a project's savings-to investment ratio, or "SIR", be greater than one – i.e., the total estimated cost savings exceed total payments. While most PACE programs require a greater than 1:1 savings to investment ratio, there are few programs that explicitly outline threshold requirements of more than 1:1. For example, the Connecticut Green Bank has cash flow conditions that stipulate that:

- The savings to investment ratio of the project is greater than or equal to 1.25x.
- The debt service coverage ratio of the project is greater than or equal to 1.75x.

[28] Report to Bridgewater Town Council (2017). Clean Energy Financing (PACE).
[29] A PACE Program in Alberta: An Analysis of the Issues (2019).

2.4 Program Evaluation

Investors, program participants, and governments who expect positive public policy outcomes all need tools to predict and verify outcomes from efficiency upgrades and to ensure they continue to accrue over time. Investor confidence depends upon knowing that the funds invested will achieve the expected savings in energy costs.[30]

The following program evaluation tools are used in the PACE programs surveyed for this report.

Program Uptake and Participation

Generally, PACE program administrators monitor the uptake of participants, applications received, funding offers, retrofit projects completed, total number of buildings improved, and the total project expenditures. Some programs also identify the social and environmental impacts, such as jobs created, average energy and water savings, and GHG reductions.

Certain program administrators may require participants to sign a utility bill information release form to provide them with information on the property's utility bill before and after the installation to obtain accurate energy savings associated with projects. Obtaining feedback from participants through surveys on how to improve program design has also been a common evaluation method. For example, The City of Toronto's HELP and Hi-RIS programs both track the following program results:

- Expressions of Interest received, funding offers, retrofit projects committed, and total project expenditures.[31]
- The programs also track key environmental, social and employment impacts: average savings per year, GHG reductions, and average natural gas, electricity, and water reductions for completed projects.[32]

[30] Page 11, https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/emmc/pdf/Financing%20Report-acc_en.pdf
[31] City of Toronto (2017). HELP and High-rise Retrofit Improvement Support Program Evaluation.
[32] Ibid.

Monitoring/ tracking outcomes

Energy and cost savings associated with PACE projects can be estimated in advance and tracked once the project is completed. While projecting and documenting savings associated with renewable energy projects is usually straightforward to measure based on metered energy generation, it can be quite difficult to reliably estimate and measure savings with energy efficiency projects. There are some key decisions for program administrators:

- Should energy audits be required?
- Should savings be documented and, if so, how?

Energy Audits

Terms vary across programs and jurisdictions but generally, an energy audit is required to determine current baseline energy usage. Some programs require lower-level audits for projects under a certain dollar threshold (i.e. under $100,000). Other programs provide flexibility as to what type of audit is done, and some determine the necessity for an audit on a case-by-case basis. Outside parties, such as contractors and engineering firms perform the audits. Programs generally require audits to be carried out by certified professionals (CIET, NYSERDA).

Documenting energy savings

Program administrators may want to measure and track PACE program contributions towards their energy and emissions goals. At a minimum as a means of assurance and quality control, several program administrators reserve the right to have a third-party qualified contractor complete an inspection and verify the completed retrofit measure by producing a commissioning report.

PACE programs may also include an evaluation, measurement, and verification (EM&V) component for determining program impacts. Which EM&V method is appropriate depends on several factors, including policy objectives, access to data, available budget, etc. EM&V is more complicated with smaller residential sector projects, than it is with commercial sector projects. Program administrators may request access to customer bill records to document savings over the pre-retrofit time-frame.

Stage 3: Program Set-up and Operations

Once the critical program foundation decisions have been made in the form of a Council-approved by-law and business case, decisions around program set-up and operations need to be made. These decisions may be made directly by the municipality and included as part of the business case, or they may be outsourced to an arms-length or independent entity following Council-approval. These decisions include:

1. Financing ongoing program administration costs
2. Stakeholder and homeowner engagement
3. Program marketing techniques

3.1 Ongoing operations and costs

Understanding the resources required to set-up and operate the program is important to program planning and decisions about self-administering the program or working through a third-party either alone or in collaboration with other municipalities. Ontario's enabling legislation doesn't stipulate whether the program need be administered by the municipality, or by an external entity. This provides municipalities with the flexibility to choose a model that suits their needs. Whether administrative tasks are delegated to an outside party may depend on budget, internal capacity, internal expertise, risk tolerance and views on the role of government. The responsibilities for these costs depends on how the program is structured and financed.

Broad areas of ongoing operations include:

- **Administrative processes:** application approvals, contract document development, marketing, customer service, IT activities, financial and technical underwriting. Staff capacity, including legal and technical expertise, will be required. These tasks can be performed by third party agencies.
- **Funding:** servicing PACE assessments (billing, collections) and recording the lien on the property. These functions are performed by the municipal tax department. When bonds are used for funding, an additional set of tasks and costs emerge that require legal and financial expertise on the part of the municipality. if these bonds are issued at a regional level, as would be the case in York Region, economies of scale may make these costs more manageable for participating lower-tier municipalities.
- **Quality assurance / Quality control:** Periodic or routine inspection of projects to ensure that contractors do quality work can instill confidence among participants. These tasks can be done by third parties with expertise in building science.

Participant fees are often charged to cover ongoing operation costs, with four basic options:

- One-time fees as a percentage of the financed amount
- Annual fees as a percentage of outstanding balance
- An "adder" to the interest rate charged on the assessment
- Flat fee

The Clean Foundation for example, is paid for their services through administrative charges on financing. For the Town of Bridgewater's retrofit program, Clean's indicated base program fee is $450, which represents less than 10% on a $5000 financing agreement, and as little as 3% on a $15,000 agreement.[33] Fees are as follows:

  - Homeowner intake & registration - $150
  - Savings-to-debt assessment and upgrade planning process - $200
  - Administration of contractor payments – $100

3.2 Stakeholder and Homeowner Engagement

Many programs establish a program advisory board, task force or similar group to help navigate the decision points preceding program launch. These bodies may be established solely to help select a program administrator or may support the program over a longer term to respond to market changes. Engaging homeowners is also important to encourage participation in the program, in addition to traditional marketing approaches.

Case study: The Hi-RIS program runs workshops and creates panel discussions to educate building owners about energy efficiency, water efficiency, and behavioural change. They make it a point to meet with building owners on a consistent basis to educate and inform them of ways to improve their buildings. Outreach is important for uptake and expansion and program administrators regularly send out emails, mail-outs, and run quarterly workshops where they partner with utilities (Toronto Hydro and Enbridge). They also host conservation awareness and training workshops for building staff, contractor engagement events, and leaders' forums where they work with leading building owners with the hopes that they will share the program with others.

Case study: City of Toronto's HELP program seeks to support the City's priority groups including people with disabilities, seniors, and low-income residents. The Programs are designed to assist these residents by improving housing conditions and maintaining housing affordability.[34] To date, activities in support of this goal have included:

[33] Report to Bridewater Council (2017).
[34] City of Toronto (2017). HELP and High-rise Retrofit Improvement Support Program Evaluation.

- Outreach in Neighbourhood Improvement Areas,
- Referrals to low income programs offered by the utility companies,
- Direct marketing and cross-promotion with Enbridge Gas including outreach to buildings eligible for the Enbridge Gas Affordable Housing Program (which provides enhanced incentives),
- Outreach to the social housing sector to build awareness with multi-residential housing providers that serve resident groups including seniors, low-income residents and people with disabilities.

Outreach can be costly in terms of staff time and challenging in terms of reaching and convincing target audiences. Developing a robust community engagement strategy that leverages good will in the community can assist.

Programs generally employ the following engagement strategies:

- Program website
- Engaging information materials: videos, fact sheets, FAQs
- Contractor workshops and training
- Property tax bill inserts
- Facilitated neighbour-to-neighbour contact

3. Property-assessed Financing Risk Assessment for Ontario Municipalities

Following the cross-jurisdictional scan, the project team developed a Risk Management Framework to document potential risks to Ontario municipalities interested in offering an LIC Loan as part of a PACE program. It is noted that as part of due diligence, a similar risk assessment should be conducted for the retrofit program. For the purposes of this risk assessment, program risk is captured as reputational risk for the municipality. These risks were identified through the cross-jurisdictional research in phase 1.

To assess each of the identified risks, and identify mitigation options, the project team facilitated a design-thinking workshop in April 2019 with municipal finance and legal staff from upper and lower tier municipalities in York Region.[35] This workshop focused on collaboratively developing a risk profile and mitigation options for (1) a self-administered **municipal model** and (2) an **entity model**, either run by a municipal services corporation or an independent third party.

The risk management framework used by the team has the following components:

1. Risk Categories
2. Risk Inventory
3. Risk Matrix (Assessment and Rating)
4. Strategies to Address Risk

Risk Categories

- **Service delivery** – Risk of not meeting customer expectations
- **Employees** – Risk that employees, contractors or other people at the municipality will be negatively impacted by a policy, program, process or project including physical harm
- **Public** – Risk that the policy, program or action will have a negative impact on citizens
- **Physical Environment** – Risk that natural capital will be damaged
- **Reputation** – Risk associated with anything that can damage the reputation of the municipality or undermine confidence
- **Financial** – Risk related to decisions about assets, liabilities, income and expenses including asset management, capital and operational funding, economic development, theft or fraud

[35] Please see Appendix C for a list of workshop participants

- **Regulatory** – Risk related to the consequences of non-compliance with laws, regulations, policies or other rules

Risk Inventory

This refers to the list of risks identified under all Risk Categories.

Risk Matrix – Assessment and Rating

Based on findings from the research, input from the workshop, and the team's expert opinion, impact and likelihood were assessed for each potential risk to come up with a risk rating. A colour rating was assigned to each risk to identify low (green), medium (yellow) and high (red) risks.

Table 6 Risk Matrix

Impact Scale ⬇					
4 Catastrophic	**4**	**8**	**12**	**16**	**20**
3 Major	**3**	**6**	**9**	**12**	**15**
2 Moderate	**2**	**4**	**6**	**8**	**10**
1 Minor	**1**	**2**	**3**	**4**	**5**
Likelihood Scale➔	**1 Rare (< 5%)**	**2 Unlikely (5-20%)**	**3 Somewhat likely (20-50%)**	**4 Likely (50-90%)**	**5 Almost Certain > 90%**

Strategies to Address Risk

The team collaboratively developed strategies to address risk again based on input from the cross-jurisdictional scan, the design thinking workshop, and expert reviewers. These strategies can be classified as follows:

1. **Accept risk** – an example might be the low risk of municipality not complying with LIC legislation, so it makes more sense to deal with it if it happens rather than invest resources into an alternative risk management strategy
2. **Avoid risk** – an example might be to limit the program to energy efficiency measures and avoid the risk that renewable energy measures might impact building department workflows.
3. **Transfer risk** – an example might be for a municipality to enter into an agreement for a third-party to administer the program.
4. **Mitigate risk** – an example might be to provide a credit enhancement to mitigate concerns of financial institutions and investors and promote uptake by homeowners.
5. **Exploit the risk** – an example might be if the uptake of home energy retrofits exceeds the business plan and being prepared to exploit the opportunity.

Following application of risk mitigation strategies, the team developed conclusion for moving forward with the development of a PACE program.

1. **Accept risk** – where a risk has been rated as low (green).
2. **Accept risk with ongoing monitoring** – where a risk is rated as low (green), but ongoing monitoring may be required through the program implementation phase to determine whether the need for mitigation arises.
3. **Accept with identified mitigation strategies** - where a risk has been rated as medium or high (yellow/red), but the identified program design considerations places the risk within the risk tolerance of the municipality and/or there is an opportunity to transfer risk to another entity using the third-party program administration model.
4. **Accept with transfer of risk** – where a risk has been rated as medium or high (yellow/red) and there is an opportunity to transfer the risk to another entity.

Tables 7 and 8 on the following pages presents a summary of the risk management frameworks for Vaughan and Newmarket completed for this project. The findings of these tables have informed the key considerations section which follows this one.

Table 7: Qualitative Municipal Risk Assessment for an LIC Program – Vaughan

Administrative Model: Municipal Model, Municipal-Owned Entity Model or Third-Party Entity Model (risks apply to all models except where noted)
Rating: Red – High, Yellow – Medium, Green – Low

No.	Risk	Context	Impact	Likelihood	Rating	Strategies to Address Risk	Conclusion
Service Delivery - customer expectations are not met, or service can no longer be provided							
1	Province repeals enabling LIC legislation.	LICs have been used in Ontario for many years to fund municipal infrastructure projects and recover costs from benefiting property owners. These regulations were expanded in 2013 to include voluntary energy and water efficiency upgrades of private homes and buildings undertaken on single properties (O. Reg 586/-6). Without this enabling legislation, municipalities could not an LIC Loan Program to property owners. Since this legislation promotes private investment in energy efficiency, it is not considered at risk of being repealed.	Catastrophic	Rare		**Mitigate:** communicate broadly the value of LICs for promoting private investment in energy efficiency to reduce emissions. **Mitigate:** consider a business plan based on market-based financing, if required.	**Accept**

2	Council repeals LIC bylaw.	Councils must pass a by-law specific to energy retrofits to enable the application of LICs. Community energy planning can demonstrate the rationale and build community support for an energy retrofit program, as well as serve as the foundation for the integration of energy and climate policies into planning tools (e.g., official plans, secondary plans, community improvement plans).	Catastrophic	Unlikely		**Mitigate:** complete a community energy plan with robust public and stakeholder engagement. **Mitigate:** integrate energy and climate policies into planning tools **Mitigate**: develop a robust business case for the program ensuring strong input from internal staff to build ownership and durability of the program in the event of changes in senior management or Council. **Mitigate**: consider a business plan based on market-based financing, if required.	**Accept with mitigation**
3	Competing municipal priorities for capital.	Municipalities require funds to build and maintain capital projects such as buildings, roads and sewers. Regardless of the strength of a business case for the program, limits on the amount of available capital may constrain the availability of capital and/or durability of the program in the event of changes in senior management or Council. Up-front municipal capitalization can be recouped over time through the program or secured a grant programs (e.g., FCM Community EcoAction)	Major	Likely	Municipal Model	**Mitigate:** ensure strong public and stakeholder engagement. **Mitigate:** develop a robust business case for the program **Mitigate:** plan to recoup up-front municipal capitalization and/or seek grant funding. <u>Alternative to reduce Risk Rating:</u> **Transfer:** establish a Municipal Services Corporation or enter into an agreement with an existing Third-Party Entity to administer the program and secure private capital based on the merits of the program.	**Accept with mitigation and/or transfer capital financing risk**
			Major	Unlikely	Municipal-owned Entity Model		
			Minor	Rare	Third-Party Entity Model		

4	Insufficient municipal resources to meet property owner demand.	Municipalities will require staffing and other administrative resources (including information technology systems to manage the LIC Loan Program). Legislation allows for the municipality to recoup administrative costs through LIC repayments.	Major	Likely	Municipal Model	**Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage appropriate departments in program design. **Transfer:** establish a Municipal Services Corporation or enter into an agreement with an existing Third-Party Entity to reduce administrative burden.	**Accept with mitigation and/or transfer administrative risk**
			Minor	Likely	Entity Model		
Employees - risk of negative impact including physical harm							
5	Impact on internal processes and workload related to building permits.	Most basic energy efficiency measures do not require a building permit. Renewable energy measures like solar thermal and PV do require building permits.	Moderate	Somewhat Likely		**Mitigate:** (initially) limit program to energy efficiency measures. **Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage building department in program design.	**Accept with mitigation**
6	Impact on internal processes and workload related to tax roll adjustments.	To qualify the special charge as having priority lien status, a municipality must have entered into an agreement with the property owner and prepare and certify a local improvement roll for the private LIC. The annual amount of the LIC that is due to the municipality must appear on the property tax roll and the property tax account for the participating property.	Moderate	Almost certain		**Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage tax departments in program design	**Accept with mitigation**
Public - risk of negative impact on a citizen							

7	Homeowner placed in a "technical" mortgage default position.	The Canadian Bankers Association has raised a concern that the LIC could put homeowners/borrowers in an unexpected default position under most lenders' standard charge term for residential mortgages. Almost all lenders obtain covenants from their borrowers with respect to additional borrowing that could result in charges against the property or that might impair priority of the lender's charge. Mortgages insured by the Canadian Mortgage and Housing Corporation (7% of mortgages in Ontario) would not be approved for an LIC loan, regardless of the business case. The City of Toronto responded to this risk by requiring homeowners to seek the consent of their mortgage lender which limited participation. However, there has been limited appetite of traditional mortgage providers to agree to new senior covenants for retrofit loans tied to property tax. The Clean Energy Financing program in Nova Scotia recommends homeowners notify their mortgage lender about their participation in program. During the initial program design process, mortgage	Major	Rare		**Mitigate:** engage mortgage lenders and mortgage insurers early in program design. **Mitigate:** address risk through program design, e.g.: • require homeowners to advise their mortgage lender of their participation in the program • require homeowner to secure mortgage lender consent to participate in the program. (not recommended due to significant impact on participation rates) • exclude properties with a CMHC insured mortgage • conduct detailed financial due diligence **Transfer:** establish a Loan Loss Reserve to manage mortgage lender concerns regarding potential losses in the event of a default.	**Accept with mitigation**

		lenders were consulted with and an internal legal discussion was conducted to address lender concerns. To date, the Clean Foundation has not encountered any bank putting their valued customer in a default position and it has not impacted program uptake. Loan Loss Reserves (LLR) have been successful in other jurisdictions to manage mortgage lender concerns. The announcement for FCM Community EcoAction noted the potential to establish an LLR for a retrofit program. The retrofit cost relative to the value of the asset is low. The risk of a mortgage lender not renewing a mortgage if the homeowner is current with both their mortgage and property tax payments is low. In the Final Report of the Expert Panel on Sustainable Finance it is recommended that in the case of municipality-sponsored PACE programs, CMHC could provide guarantees for Local Improvement Charge (LIC) financing programming.					

8	MPAC increases homeowner property taxes.	Home improvements can increase the value of the home. This can increase the MPAC-assessed value of the home. However, MPAC currently does not include energy efficiency in its property assessments so there is no clear link to increasing property assessments and resulting taxes.	Minor	Unlikely			**Accept with ongoing monitoring**
9	Impact on resale of home.	Despite the presumed offset of reduced utility costs, an LIC attached to a home could have the perception of higher cost of ownership in the marketplace. Equally, improved energy efficiency could have a positive impact on increasing the market value (not the MPAC-assessed value) of the home, thus increasing the asset value to the homeowner.	Moderate	Somewhat Likely		**Mitigate:** engage real estate industry early in program design. **Mitigate:** implement a home energy labelling program to change market demand for efficient homes.	**Accept**
10	Increase in municipal tax sales.	If a homeowner defaults on their property taxes, the municipality can take their property to a tax sale. Municipal property taxes are also considered "recession proof". The municipality also has other options to consider before taking the step of initiating a tax sale.	Moderate	Unlikely		**Mitigate:** address through program design by ensuring annual utility savings are equal to or exceed the annual increase to property taxes.	**Accept with mitigation**

Physical Environment - risk of damage to natural capital							
None identified.							
Reputation - risk of damage to municipal reputation (i.e., program risk)							
11	Failure to establish an effective governance model for the entity as a Municipal Services Corporation	Effective governance of the Municipal Services Corporation is essential for the success of the program.	Major	Unlikely	Municipal-owned Entity Model only	**Mitigate:** include governance expertise in the due diligence process. **Transfer:** enter into cross-municipal partnerships to share governance knowledge. **Transfer:** enter into a partnership with an existing municipally owned corporation.	**Accept with mitigation and/or transfer risk**
12	Municipality fails to efficiently and effectively administer the retrofit program	Retrofit program poorly managed ((e.g., fraudulent use of program, home energy savings not realized, failure to achieve cost scale).	Major	Unlikely	Municipal Model only	**Mitigate:** develop a robust business case for the retrofit program. **Mitigate:** conduct a risk assessment for the retrofit program. **Note:** The Likelihood of the Municipal Model failing to achieve scale is Almost Certain. The Risk Rating would be High (red) if this was a goal of the program. **Transfer:** establish an Entity to administer the retrofit program on behalf of the municipality	**Accept with mitigation and/or transfer of risk**

13	Entity fails to efficiently deliver the retrofit program.	Retrofit program poorly managed (e.g., fraudulent use of program, home energy savings not realized, failure to achieve cost scale).	Moderate	Unlikely	Municipal-owned and Third-Party Entity Models	**Mitigate:** robust due diligence in establishing LIC-enabling partnership agreement between the municipality and the Entity.	**Accept with mitigation**
Financial - risk of financial harm to the municipality							
14	Negative impact on municipal debt management and credit rating.	Municipal governments have a provincially legislated debt ceiling or Annual Repayment Limit (Ontario Regulation 403/02 (Debt and Financial Obligation Limits) under the Municipal Act, 2001). Municipal debt obligations in respect of the owner's share of the cost of a work undertaken as a local improvement do not count towards the municipal debt limit. The debt of municipal services corporations is not attributed to the owner municipality.	Minor	Unlikely		**Mitigate:** engage credit agencies early. **Mitigate:** use reserves for up-front municipal capital contributions **Mitigate:** plan to recoup up-front municipal capitalization through program and/or seek grant funding.	**Accept with mitigation**
15	Homeowners default on LIC payment.	Municipal property taxes are considered "recession proof". The municipality has priority lien status in the event of a tax sale.	Moderate	Rare		**Mitigate:** address through program design, e.g.: • ensure annual utility savings are equal to or exceed the annual increase to property taxes • establish financial limitations including debt-service ratio, combined loan to value ratio, and assessment to value ratio for project eligibility • ensure applicant's property tax and utility bills are in good standing • require homeowner to sign-up for a pre-authorize payment plan	**Accept with mitigation**

						Transfer: require homeowners to secure mortgage lender consent to participate in the program (not recommended due to significant impact on participation rates)	
16	Impact of interest rate fluctuations.	Interest rates of capital vary over the course of a retrofit program	Minor	Likely		**Mitigate:** stress test for changes to interest rates in the business plan.	**Accept with mitigation**
17	Municipality liable for damages due to defective work of independent contractors.	By promoting an LIC-based retrofit program, a municipality may expose themselves legally if a contractor provides defective work, whether endorsed by the municipality or not.	Minor	Unlikely		**Mitigate:** include language in the enabling By-law to protect the municipality. **Mitigate:** address through program design, e.g., • Entity enters into contract with contractors • pre-qualified contractors • quality control oversight	**Accept with mitigation**
18	Administration costs exceed business plan.	Incremental increases to municipal administrative costs associated with offering LIC loans are to be recouped through the LIC payment.	Major	Unlikely		**Mitigate:** use conservative assumptions and include appropriate contingencies in business plan	**Accept with mitigation and ongoing monitoring**
Regulatory Risk - risk of non-compliance with legislation or regulations							

19	Non-compliance with LIC legislation.	The portion of the imposed special charge due each year must be added to the municipality's tax roll for that property to ensure the LIC is appropriately attached to the property. The useful life of the proposed energy improvement cannot be less than the LIC payment term limit. However, municipalities have experience with the LIC mechanism as well as establishing internal controls to ensure regulatory compliance.	Moderate	Unlikely		**Mitigate:** engage tax and legal departments in program design to ensure effective internal controls **Mitigate:** document regulatory obligations in the enabling by-law **Mitigate:** integrate building science assessment into program design	**Accept with mitigation and ongoing monitoring**
20	Non-Compliance with Ontario Building Code (OBC)	Some energy retrofits may require a building permit. Renewable energy retrofits are more likely to require a building permit than energy efficiency measures	Minor	Unlikely		**Mitigate:** engage building department in program design **Mitigate:** address through program design, e.g.: • integrate building permit compliance into program design • limit eligible retrofit measures to energy efficiency	**Accept with mitigation and ongoing monitoring**
21	Non-compliance with O.Reg. 599/06 (Municipal Services Corporation)	Some Ontario municipalities have limited experience with Municipal Services Corporations.	Major	Unlikely	Municipal-owned Entity Model	**Mitigate:** engage legal department in program design	**Accept with mitigation**

Table 8: Qualitative Municipal Risk Assessment for an LIC Program – Newmarket

Administrative Model: Municipal-Owned Entity or Third-Party Entity Model

Rating: Red – High, Yellow – Medium, Green – Low

No.	Risk	Context	Impact	Likelihood	Rating	Strategies to Address Risk	Conclusion
Service Delivery - customer expectations are not met, or service can no longer be provided							
1	Province repeals enabling LIC legislation.	LICs have been used in Ontario for many years to fund municipal infrastructure projects and recover costs from benefiting property owners. These regulations were expanded in 2013 to include voluntary energy and water efficiency upgrades of private homes and buildings undertaken on single properties (O. Reg 586/-6). Without this enabling legislation, municipalities could not an LIC Loan Program to property owners. Since this legislation promotes private investment in energy efficiency, it is not considered at risk of being repealed.	Catastrophic	Rare		**Mitigate:** communicate broadly the value of LICs for promoting private investment in energy efficiency to reduce emissions. **Mitigate:** consider a business plan based on market-based financing, if required.	**Accept**
2	Council repeals, or fails to enact,	Councils must pass a by-law specific to energy retrofits to enable the application of LICs.	Catastrophic	Unlikely		**Mitigate:** complete a community energy plan with robust public and stakeholder engagement. **Mitigate:** integrate energy and climate policies into planning tools	**Accept with mitigation strategies**

	an enabling LIC bylaw.	Community energy planning can demonstrate the rationale and build community support for an energy retrofit program, as well as serve as the foundation for the integration of energy and climate policies into planning tools (e.g., official plans, secondary plans, community improvement plans).				**Mitigate**: develop a robust business case for the program ensuring strong input from internal staff to build ownership and durability of the program in the event of changes in senior management or Council. **Mitigate**: consider a business plan based on market-based financing, if required.	
3	Competing municipal priorities for capital.	Municipalities require funds to build and maintain capital projects such as buildings, roads and sewers. Regardless of the strength of a business case for the program, limits on the amount of debt that can be taken on by a municipality or availability of reserve funding may constrain the availability of capital and/or durability of the program in the event of changes in senior management or Council. Up-front municipal capitalization can be recouped over time through the program or secured a grant programs (e.g., FCM Community EcoAction)	Major	Likely		**Transfer:** establish a Municipal Services Corporation or enter into an agreement with an existing Third-Party Entity to administer the program and secure private capital based on the merits of the program. **Mitigate:** plan to recoup up-front municipal capitalization and/or seek grant funding. <u>Alternative to reduce Risk Rating:</u> **Transfer:** enter into an agreement with an existing Third-Party Entity	**Accept with mitigation strategies and transfer of capital financing risk**
4	Insufficient municipal resources to meet property owner demand.	Municipalities will require staffing and other administrative resources including information technology systems to manage the LIC Loan Program.	Minor	Likely		**Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage appropriate departments in program design.	**Accept with mitigation strategies or transfer risk**

		Legislation allows for the municipality to recoup administrative costs through LIC repayments.					
Employees - risk of negative impact including physical harm							
5	Impact on internal processes and workload related to building permits.	Most basic energy efficiency measures do not require a building permit. Renewable energy measures like solar thermal and PV do require building permits.	Moderate	Somewhat Likely		**Mitigate:** (initially) limit program to energy efficiency measures. **Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage building department in program design.	**Accept with mitigation strategies**
6	Impact on internal processes and workload related to tax roll adjustments.	To qualify the special charge as having priority lien status, a municipality must have entered into an agreement with the property owner and prepare and certify a local improvement roll for the private LIC. The annual amount of the LIC that is due to the municipality must appear on the property tax roll and the property tax account for the participating property.	Moderate	Almost certain		**Mitigate:** recover administrative costs through the LIC payment. **Mitigate:** engage tax departments in program design	**Accept with mitigation strategies**
Public - risk of negative impact on a citizen							
7	Homeowner placed in a “technical” mortgage default position.	The Canadian Bankers Association has raised a concern that the LIC could put homeowners/borrowers in an unexpected default position under most lenders’ standard charge term for residential mortgages. Almost all lenders obtain covenants from their borrowers with	Major	Rare		**Mitigate:** engage mortgage lenders and mortgage insurers early in program design. **Mitigate:** address risk through program design, e.g.: • require homeowners to advise their mortgage lender of their participation in the program • require homeowner to secure mortgage lender consent to participate in the program	**Accept with mitigation strategies**

		respect to additional borrowing that could result in charges against the property or that might impair priority of the lender's charge. Mortgages insured by the Canadian Mortgage and Housing Corporation (7% of mortgages in Ontario) would not be approved for an LIC loan, regardless of the business case. The City of Toronto requires homeowners to seek the consent of their mortgage lender which limited participation. The Clean Energy Financing program in Nova Scotia recommends homeowners notify their mortgage lender about their participation in program. During the initial program design process, mortgage lenders were consulted with and an internal legal discussion was conducted to address lender concerns. To date, the Clean Foundation has not encountered any bank putting their valued customer in a default position and it has not impacted program uptake. Loan Loss Reserves (LLR) have been successful in other jurisdictions to manage mortgage lender concerns. The announcement for FCM Community EcoAction noted the potential to establish an LLR for a retrofit program.				(not recommended due to significant impact on participation rates) • exclude properties with a CMHC insured mortgage **Transfer:** establish a Loan Loss Reserve to manage mortgage lender concerns regarding potential losses in the event of a default.	

8	MPAC increases homeowner property taxes.	Home improvements can increase the value of the home. This can increase the MPAC-assessed value of the home. However, MPAC currently does not include energy efficiency in its property assessments so there is no clear link to increasing property assessments and resulting taxes.	Minor	Unlikely			**Accept with ongoing monitoring**
9	Impact on resale of home.	Despite the presumed offset of reduced utility costs, an LIC attached to a home could have the perception of higher cost of ownership in the marketplace. Equally, improved energy efficiency could have a positive impact on increasing the market value (not the MPAC-assessed value) of the home, thus increasing the asset value to the homeowner.	Moderate	Somewhat Likely		**Mitigate:** engage real estate industry early in program design. **Mitigate:** implement a home energy labelling program to change market demand for efficient homes.	**Accept**
10	Increase in municipal tax sales.	If a homeowner defaults on their property taxes, the municipality can take their property to a tax sale. Municipal property taxes are also considered "recession proof". The municipality also has other options to consider before taking the step of initiating a tax sale.	Moderate	Unlikely		**Mitigate:** address through program design by ensuring annual utility savings are equal to or exceed the annual increase to property taxes.	**Accept with mitigation strategy**

Physical Environment - risk of damage to natural capital							
None identified.							
Reputation - risk of damage to municipal reputation							
11	Failure to establish an effective governance model for the entity as a Municipal Services Corporation	Effective governance of the Municipal Services Corporation is essential for the success of the program.	Major	Unlikely		**Mitigate:** include governance expertise in the due diligence process **Transfer:** enter into cross-municipal partnerships to share governance knowledge **Transfer:** enter into a partnership with an existing municipally owned corporation	**Accept with mitigation strategies and/or transfer risk**
12	Entity fails to efficiently deliver the retrofit program	Retrofit program poorly managed (e.g., fraudulent use of program, home energy savings not realized, failure to achieve cost scale).	Moderate	Unlikely		**Mitigate:** robust due diligence in establishing LIC-enabling partnership agreement between the municipality and the entity.	**Accept with mitigation strategy**
Financial - risk of financial harm to the municipality							
13	Negative impact on municipal debt management and credit rating.	Municipal governments have a provincially legislated debt ceiling or Annual Repayment Limit (Ontario Regulation 403/02 (Debt and Financial Obligation Limits) under the Municipal Act, 2001). Municipal debt obligations in respect of the owner's share of the cost of a work undertaken as a local improvement do not count towards the	Minor	Almost certain		**Mitigate:** engage credit agencies early. **Mitigate:** use reserves for up-front municipal capital contributions **Mitigate:** plan to recoup up-front municipal capitalization and/or seek grant funding.	**Accept with mitigation strategies**

		municipal debt limit. The debt of municipal services corporations is not attributed to the owner municipality.					
14	Homeowners default on LIC payment.	Municipal property taxes are considered "recession proof". The municipality has priority lien status in the event of a tax sale.	Moderate	Rare		**Mitigate:** address through program design, e.g.: • ensure annual utility savings are equal to or exceed the annual increase to property taxes • establish financial limitations including debt-service ratio, combined loan to value ratio, and assessment to value ratio for project eligibility • ensure applicant's property tax and utility bills are in good standing • require homeowner to sign-up for a pre-authorize payment plan **Transfer:** require homeowners to secure mortgage lender consent to participate in the program (not recommended due to significant impact on participation rates)	**Accept with mitigation strategies**
15	Impact of interest rate fluctuations.	Interest rates of capital vary over the course of a retrofit program	Minor	Likely		**Mitigate:** stress test for changes to interest rates in the business plan.	**Accept with mitigation strategies**
16	Municipality liable for damages due to defective work of independent contractors.	By promoting an LIC-based retrofit program, a municipality may expose themselves legally if a contractor provides defective work, whether endorsed by the municipality or not.	Minor	Unlikely		**Mitigate:** include language in the enabling By-law to protect the municipality. **Mitigate:** address through program design, e.g., • Entity enters into contract with contractors • pre-qualified contractors • quality control oversight	**Accept with mitigation strategies**

17	Administration costs exceed business plan.	Incremental increases to municipal administrative costs associated with offering LIC loans are to be recouped through the LIC payment.	Major	Unlikely		**Mitigate:** use conservative assumptions and include appropriate contingencies in business plan	**Accept with mitigation strategies and ongoing monitoring**
Regulatory Risk - risk of non-compliance with legislation or regulations							
18	Non-compliance with LIC legislation.	The portion of the imposed special charge due each year must be added to the municipality's tax roll for that property to ensure the LIC is appropriately attached to the property. The useful life of the proposed energy improvement cannot be less than the LIC payment term limit. However, municipalities have experience with the LIC mechanism as well as establishing internal controls to ensure regulatory compliance.	Moderate	Unlikely		**Mitigate:** engage tax and legal departments in program design to ensure effective internal controls **Mitigate:** document regulatory obligations in the enabling by-law **Mitigate:** integrate building science assessment into program design	**Accept with mitigation strategies and ongoing monitoring**
19	Non-Compliance with Ontario Building Code (OBC)	Some energy retrofits may require a building permit. Renewable energy retrofits are more likely to require a building permit than energy efficiency measures	Minor	Unlikely		**Mitigate:** engage building department in program design **Mitigate:** address through program design, e.g.: • integrate building permit compliance into program design • limit eligible retrofit measures to energy efficiency	**Accept with mitigation strategies and ongoing monitoring**

20	Non-compliance with O.Reg. 599/06 (Municipal Services Corporation)	Some Ontario municipalities have limited experience with Municipal Services Corporations.	Major	Unlikely		**Mitigate:** engage legal department in program design	**Accept with mitigation strategies**

4. Key Considerations for Ontario Municipalities

In this section key considerations are focused on enabling municipal policy (stage 1) and program foundation (stage 2). While decisions surrounding program set-up and operations (stage 3) are important, these are decisions that may reasonably be deferred to follow Council approval of the initial business case/program rationale and be delegated to an arms-length or independent program administrator depending on decisions made in stages 1 and 2.

Stage 1: Municipal Policy and By-Laws

Official Plan

By identifying and prioritizing the improvement of energy efficiency in existing residential and commercial buildings within the Municipal Official Plan, and specifically indicating a policy of encouraging energy and water retrofits, the municipality will send a high-level policy signal that would provide support for the development of energy retrofit programs. The City of Vaughan's 2010 Official Plan does include policy on energy conservation and efficiency, but it does not explicitly mention or prioritize retrofits in the existing built environment.

Community Improvement Plan[36]

Building upon the high-level supportive policy in the Municipal Official Plan, specific OP policy that enables the designation of Community Improvement Plan (CIP) project areas based on criteria related to improving the energy performance of the existing built environment would further reinforce the policy rationale for an LIC-based energy retrofit program.

A CIP, which is enabled under s.28(2) of the *Planning Act* and requires an enabling by-law to be passed by Council, can be used to provide further legislative support for the energy efficiency retrofit program. CIPs can be broadly justified based on whether there may be environmental, social or economic benefits to such a designation. Where a By-law has been passed to designate a community improvement project area, section 28(3) of the *Planning Act* allows the municipality to facilitate private investment, which provides policy support for the development of a property-assessed loan program.

A CIP designation also provides the municipality with the Authority to set-up an Economic Development-focused Municipal Services Corporation.

[36] Municipal of Municipal Affairs and Housing. Community Improvement Planning Handbook. http://www.ontla.on.ca/library/repository/mon/14000/262948.pdf

LIC Enabling By-Law / Initial Business Case

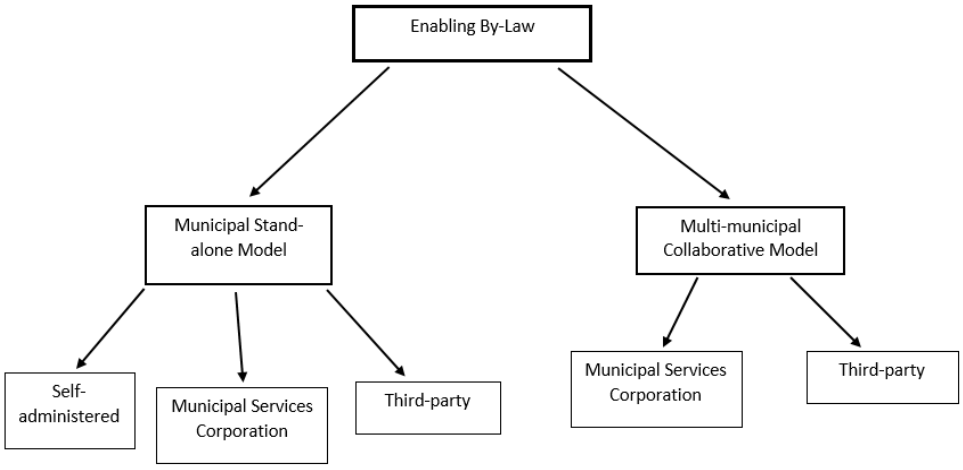
Key points to include in the initial business case include:

- A clear indication of the public purpose goals of the program, namely driving local economic development, improving community well-being, and GHG emissions reductions over the long-term
- A statement of the types of energy works covered, and specific mention of areas such as electric vehicle charging infrastructure, control and monitoring systems for demand response and efficiency, energy storage, distributed renewables (e.g. solar PV/hotwater) district energy and water conservation measures including lot-level stormwater management
- Based on decisions made in latter stages (see below), a statement of sources of funds for the program initiation and scale-up (e.g. bonds, private capital, reserve funds) and how the funds will be governed
- A statement that administration costs will be recovered, including administration, interest, marketing materials, etc.

Stage 2: Program Foundation

Administrative Model

Table 8 Program Administrative Model Options



While an initial pilot program may be a self-administered standalone model, transitioning to a collaborative multi-municipal model may be more appropriate for smaller localities that lack the market size to be able to recover program operating costs through transactions. Where there isn't enough transaction volume, administration fees on each individual transaction required to maintain program operations may be onerous for participants. It is only in larger urban centres, like Toronto and Halifax, where standalone PACE financing models have persisted. Pursuing a multi-municipal regional model can lead to a larger, more seamless market which provides a strong signal to lenders, homeowners and building owners, and energy services contractors and accelerates market adoption.

Pursuing a multi-municipal approach requires either an arms-length Municipal Services Corporation or independent organization model to operationalize.

Municipal Services Corporation Model

Under the provisions of Regulation 599/2016 of the Municipal Act, 2001, a municipality may exercise its right to establish a Municipal Services Corporation, either alone or in partnership with other municipalities or public entities, following:

1. Adoption of a business case study
2. Adoption and maintenance of policies on asset transfers to corporations, and
3. Consultation with the public about the proposal to establish the corporation.

The Municipal Act allows municipal services corporations to be established to provide a "system, service or thing that the municipality itself could provide". Regulation 599/2016 specifically indicates that a municipality may also designate the corporation as a designated economic development corporation to undertake "community improvement consistent with a community improvement plan approved by the municipality under subsection 28 (4) of the Planning Act". While a municipality doesn't need a CIP to create a municipal services corporation, it is increasingly common for Community Improvement Plans to identify energy efficiency as a desired improvement.

One example of this governance model in the Ontario municipal energy sector – namely Alectra Utilities Corporation which is jointly owned by seven municipalities across the Greater Golden Horseshoe Area, including the City of Vaughan. This could be a promising governance and administrative model for a multi-municipal PACE program in York Region.

Financial Management and Program Capitalization

Initial Capitalization

Initial program start-up and capitalization costs can be sourced from municipal reserve funds, or through senior government sources, including the Federation of Canadian Municipalities' Green Municipal Fund (GMF). Infrastructure Ontario's loan program may be another source of senior government capital.

The Federal Government recently announced a $300 million Community EcoEfficiency Acceleration program, based within GMF to provide funding for municipal PACE programs.[37] While details have yet to be announced, and funding is not yet available, this program could be leveraged for initial capitalization or to establish a loan loss reserve to provide risk mitigation measure in either a self-capitalized or private sector capitalized program model.

Achieving scale

While initial program capital can be recycled over time in a limited scale program, to achieve the financial scale additional capital will need to be secured. Options include:

- **Municipal bond issuance -** In a tiered-municipal context, only upper-tier municipalities can issue debt, and so this approach requires collaboration between upper-tier and lower-tier municipalities within a region or county. Ontario legislation states that municipal debt obligations in respect of the owner's share of the cost of a work undertaken as a local improvement do not count towards the municipal debt limit. However, the upper-tier municipality would have to incur the costs associated with debt issuance on behalf of the lower-tier, and so this would have an impact on the program administration costs required to cover ongoing operations.
- **Municipal services corporation bond issuance –** In a tiered-municipal context, this approach could avoid the need to engage the Upper-tier municipality in issuing a bond for the lower-tier PACE program. If a group of lower-tier municipalities were to establish an MSC with an initial capital base sourced from municipal reserves or senior government grant/loan capital (e.g. FCM GMF, Infrastructure Ontario loan), the arms-length organization could leverage that capital base to issue bonds to raise capital for PACE loans.

[37] Government of Canada Budget 2019. *Reducing Costs Through Energy Efficiency.* https://www.budget.gc.ca/2019/docs/plan/chap-02-en.html

- **Direct private sector capital investment –** in a municipally-owned or third-party entity model, the PACE program could be capitalized through direct private sector lending.

Addressing Lender concerns

There are concerns from mortgage lenders and insurers over senior lien position of LIC/PACE compared to the mortgage. The CMHC or Canadian Bankers Association (CBA) has yet to issue a formal position on LIC programs. Program administrators should recommend participants secure mortgage holder consent. Furthermore, establishing criteria to evaluate applicant ability to pay: e.g. current on obligations, debt to income thresholds, can also help alleviate lender concerns.

Eligible Property Types – Residential / Commercial

While Ontario's enabling legislation covers both residential and commercial properties, there are fundamental differences in how each program approaches the market, which have important design implications. Given the differences in ownership models between owner-occupied residential, multi-unit/rental residential, and commercial properties, it is recommended that each be delivered as distinct programs, i.e.:

- Residential - owner-occupied (focused on single-family homes)
- Residential – multi-unit, rental properties, condominiums with shared systems
- Commercial

Commercial building and project sizes are larger and therefore tend to have larger risk profiles. Given the preponderance of energy consumption and emissions in Ontario's residential building sector, it is recommended that municipalities begin with an R-PACE program at the outset. Where residential sector emissions are dominated by the single-family home sub-sector, such as is the case in York Region, it is recommended that programs focus there at least initially.

Program Evaluation and Monitoring

To provide confidence to potential investors, as well as to create a mechanism to monitor program performance and contribution to municipal energy and GHG objectives, a robust project-level monitoring program is required. Such a program would have as key elements at a minimum:

- Ex-ante energy assessment to identify recommended improvements, estimated cost savings and potential rebates and incentives
- Ex-post inspection to ensure that work was completed as planned
- Access to pre and post property utility data for some period of years (e.g. 3-5 years) as a requirement of program enrollment.

5. Appendices

Appendix A – Overview of Canadian LIC Programs

Program	Alberta PACE Program
General Description & Administration	• The Government of Alberta is working with Energy Efficiency Alberta (EEA) in order to design a PACE program, including tools to assist municipalities. • EEA is a new Government of Alberta agency that will be the designated PACE administrator dedicated to reducing the province's energy demand.[38] • Their mandate is to help build awareness on energy conservation, promote and design energy efficiency programs, and help communities reduce their carbon emissions. • The government of Alberta is also undergoing a consultation phase in order to clarify administrative roles. This process involves consulting with municipalities, lenders, real estate associations, and other stakeholders in order to develop PACE programs. ○ EEA is working with Edmonton to design a pilot program.
PACE-Enabling Legislation	• PACE legislation was passed in January 2019 • It is then up to municipalities to pass bylaws to establish their own PACE programs
Program Launch	N/A
Eligible Properties	• Residential, commercial, and agricultural properties (industrial properties are ineligible)
Eligible Measures	• Energy efficiency, water conservation, or on-site renewable energy systems
Funding Mechanism & Financing	N/A
Funding Terms	N/A
Program results	N/A

[38] PACEAlberta (2019).

Program	City of Toronto Home Energy Loan (HELP) & High-rise Retrofit Improvement Support Program (Hi-RIS)
General Description & Administration	• The Program operates as two financing streams: The Home Energy Loan Program (HELP) for eligible homes; and, the High-rise Retrofit Improvement Support Program (Hi-RIS) for multi-unit residential buildings. • HELP is administered by the City of Toronto's Environment and Energy division, while Hi-RIS is administered by the City's Tower Neighbourhood Revitalization Unit. • Both program administrators work with other City departments to coordinate the program. Revenue Services plays a key role in applicant screening processes, with Legal Services also playing a more limited role in reviewing applications. The marketing and outreach is conducted through a collective effort by the Hi-RIS team.
PACE-Enabling Legislation	• Ontario passed enabling legislation in October 2012
Program Launch	• HELP and Hi-RIS were launched in 2014 as pilot programs
Eligible Properties	• HELP - Single family homes • Hi-RIS - Multi-unit residential (3 to 5 storeys)
Eligible Measures	• Energy Efficiency, water conservation improvements, and renewable energy systems (solar rooftop PV)
Funding Mechanism & Financing	• Funding: The Local Improvement Charge Energy Works Reserve Fund was established by the City of Toronto with a $20 million contribution to fund the program. • The HELP and Hi-RIS Programs were each allocated a $10 million funding envelope to be administered to qualifying property owners interested in undertaking retrofit investments. This reserve funding is partitioned both formally and informally. To date, $2.7 million has been committed to residents under HELP, and $7.7 million ($4.1 million disbursed, $3.6 million in commitments) under Hi-RIS Program. • The City of Toronto's Green Debenture Framework has been designed to include funding for LIC programs. • Financing:
Funding Terms	• Financing available for up to 20 years

Program results	• During its 3-year pilot phase, both HELP and Hi-RIS have been successful in helping the City of Toronto meet a range of priorities including: maintaining housing affordability, improving housing quality, increasing energy efficiency, reducing GHG emissions, natural gas and electricity savings, and job creation.
	  ○ Approximately 30 jobs were created for making energy efficiency improvements during the 3-year pilot period.
	  ○ To date, almost $14.9 million in financing has been committed to projects with over 202 properties participating in the program, which has resulted in an emissions reduction of over 4,000 tonnes of CO2 equivalents.[39]
	• Pending council decision, it is hoped that the program will be extended to 2021, along with additional design enhancements in order to make it more attractive.

[39] City of Toronto (2019). Extending Successful Energy Retrofitting Programs.

Program	Clean Energy Financing (PACE) Program - Town of Bridgewater
General Description & Administration	• The Clean Foundation is a non-profit, non-government environmental organization which collaborates with municipalities across Nova Scotia to create an LIC program tailored to their needs. • The Clean Foundation administers the Clean Energy Financing PACE program on behalf of the Town of Bridgewater.
PACE-Enabling Legislation	• Nova Scotia first passed its PACE legislation in 2012; the Town of Bridgewater enacted the PACE Program By-law in 2015. • Municipalities then enabled PACE through a local by-law which allows municipalities to offer PACE financing to property owners.
Program Launch	• 2016
Eligible Properties	• Multi-residential buildings
Eligible Measures	• Energy efficiency measures and renewable energy systems
Funding Mechanism & Financing	• Grant funding from Natural Resources Canada fully resourced the program. • Pilot year program design, marketing, and evaluation costs were funded by a grant from the Department of Energy. • Financing: financing payments collected by the municipality similar to property taxes. ○ Administrative fees charged to cover costs of administration
Funding Terms	• Financing available for up to 10 years
Program Results	• The program saw strong uptake from residents across all municipalities, along with an average of 33% energy savings from energy efficiency improvements. • Program completed a successful pilot year in 2016, and has now been extended for 5 years (2017-2021). Town Council has committed $300,000 in financing per year, subject to annual review. • Eligible program measures are to be expanded to enable deeper residential energy retrofits, targeting 'net zero' performance.[40]

[40] Town of Bridgewater (2017). Report to Bridgewater Town Council.

Program	Peterborough LIC Program
General Description & Administration	• Development of an LIC framework in the City of Peterborough began in February 2017. • The LIC pilot project aims to create a LIC process with supporting education and tools, leverage existing grants and incentives to finance residential improvements, and implement pre-and post-audits to support the business case for the retrofit. • The City is reviewing a draft version of the LIC framework and circulating the draft to its various project committees. • Once the pilots have been implemented, the City envisions rolling out similar programs in some of the surrounding Townships and First Nations in the Greater Peterborough Area.
PACE-Enabling Legislation	• Ontario passed enabling legislation in October 2012
Program Launch	N/A
Eligible Properties	N/A
Eligible Measures	N/A
Funding Mechanism & Financing	• Funding for the project was supported by the $7,000 grant from the Ministry of the Environment, Conservation and Parks (MOECC) for participating in the Collaborative Implementation Group project. Some funding was also leveraged through the City's Sustainable Operating account for the planning and development process. • The City is also exploring several different funding and implementation streams in order to implement the LIC. This includes working with Fleming College through their local trade school to submit an application for skill training and pilot to the Natural Sciences and Engineering Research Council.
Funding Terms	N/A
Program Results	N/A

Appendix B – Overview of U.S PACE Programs

Program	Arkansas A2E2 PACE Program (Fayetteville & Springdale)
General Description & Administration	• The Arkansas Advanced Energy Equity (A2E2) PACE Program is administered by a joint venture between Energy Equity Funding (EEF), LLC and the Arkansas Advanced Energy Association (AAEA) on behalf of the Fayetteville Energy Improvement District (EID). • A2E2, LLC provides services in program design, consulting, and turnkey administration. This includes support for the establishment of the PACE Board, community outreach, public education.
PACE-Enabling Legislation	• Legislation passed in 2013
Program Launch	• 2014
Eligible Properties	• Commercial
Eligible Measures	• Energy efficiency improvements, water conservation, and renewable energy systems
Funding Mechanism & Financing	• Funding: The Property Assessed Clean Energy Act authorized local governments in Arkansas to grant tax-exempt bonds for the purposes of funding low-interest, long term loans to property owners for renewable energy projects and energy efficiency improvements. • Financing: after financing is approved by lending institution, improvements are installed. The lending institution disburses funds after verifying completed projects. • Application fees are charged for administrative costs.
Funding Terms	• Financing up to 20 years
Program results	• Since program launch, there has been more than $700,000 in C-PACE investment through the program.[41]

[41] PACENation. (2017). Economic, Energy, and Environmental Impact Report.

Program	California PACE - Sonoma County Energy Independence Program (SCEIP)
General Description & Administration	• SCEIP was the first multijurisdictional PACE program in North America, which covers all areas in the geographic County of Sonoma. • The program is operated by the Sonoma County's Energy and Sustainability Division (ESD). In addition to SCEIP Financing, ESD also offers services for energy audits and project consultations. • In California, many of the cities that have launched PACE financing programs in their jurisdictions operate under a joint powers authority (JPA) structure, allowing cities and counties to join as a member with little or no cost or administrative burden.
PACE-Enabling Legislation	• PACE was first legislated in 2007
Program Launch	• 2009
Eligible Properties	• Commercial, industrial, multi-family, and non-profit
Eligible Measures	• Energy efficiency, water conservation, and renewable energy
Funding Mechanism & Financing	• $65 million in funding provided by Sonoma County and the Sonoma County Water Agency
Funding Terms	• Financing for up to 20 years.
Program results	• Since program launch, SCEIP has financed over 9.9MW of photovoltaic solar generation, equating to a GHG reduction of 8,600 tons annually.[42] • The program has financed over $70 million in projects, representing over 2100 residential properties, 60 non-residential properties and 3600 individual improvements. • Because a majority of the improvements have been performed by local contractors, most of the $65 million in funding has remained within the local community generating over 80 job-years of local labor.

Program	Connecticut C-PACE (Green Bank) Program

[42] PACENation (2017).

General Description & Administration	• Program administered by the Connecticut Green Bank that helps commercial, industrial, and multi-family owners access affordable, long-term financing for smart energy upgrades to their buildings. • The Green bank plays a central role in developing the statewide program standards and guidelines that municipalities will agree to follow when joining. • Local governments and municipalities (169 total in Connecticut) work with the Green Bank to make C-PACE financing available in their communities by passing state bylaws.
PACE-Enabling Legislation	• Connecticut passed PACE-enabling legislation in 2011
Program Launch	• 2013
Eligible Properties	• Industrial, commercial, multi-family, and non-profit
Eligible Measures	• Energy efficiency, water conservation, and renewable energy
Funding Mechanism & Financing	• Public and private funding sources. • The Green Bank handles all the disbursements after project approval and after homeowners sign financing agreements.
Funding Terms	• Financing terms between 5 and 25 years for repayment
Program Results	• More than $100 million has been invested in C-PACE projects. • The Green Bank's C-PACE projects have resulted in 29.6 MW of clean energy deployed and has saved $221.3 million in energy costs. It has also yielded various benefits in the form of 489,350 tons of GHG emissions eliminated and the creation of 119 jobs.[43]

Program	**D.C PACE Program**

[43] Connecticut Green Bank. (2018). Q3 2018 Report. C-PACE.

General Description & Administration	• The program is independently administered by Urban Ingenuity, which administers the program on behalf of the Department of Energy and Environment (DOEE).
PACE-Enabling Legislation	• Legislation passed in 2010 (The Energy Efficiency Financing Act of 2010)
Program Launch	• 2013
Eligible Properties	• Commercial and multifamily buildings
Eligible Measures	• Energy efficiency, renewable energy measures (solar, PV, solar thermal, geothermal), energy storage, audits
Funding Mechanism & Financing	• Private funding (range of local and regional banks and PACE-specific lenders and other lending institutions) • The payment rates may be fixed or adjusting, and are dependent upon the selected capital provider. The energy savings are used to pay back the cost of the improvements through a special assessment placed on the property.
Funding Terms	• Financing for 15-20 year terms
Program results	• Following program implementation, DC PACE was listed in the top PACE programs 10 in the United States, with a total of $34.3 million invested in PACE projects as of 2017.[44]

[44] PACENation. (2017). Economic, Energy, and Environmental Impact Report.

Program	Florida's PACE Funding Agency (FPFA) and Alliance NRG Program
General Description & Administration	• The Florida PACE Funding Agency (FPFA) administers the state-wide Alliance NRG program. FPFA is a single purpose local government making its PACE program available to any subscribing Florida city or county. • The agency was created 'by local governments, for local governments'
PACE-Enabling Legislation	• Florida passed PACE-enabling legislation in 2010
Program Launch	• 2011
Eligible Properties	• Commercial and residential properties
Eligible Measures	• Energy efficiency, renewable energy, and wind resistant improvements / hurricane protection improvements that are permanently affixed to the property
Funding Mechanism & Financing	• FPFA is authorized to issue bonds as needed to provide funds with which to finance qualifying improvements. Bonds are issued under an indenture between the authority and a trustee for the holders of the bonds. The participating municipality collects the annual assessment installments along with property taxes and other assessments on the property, and remits the annual assessment installment to the trustee for the benefit of the holders of the Boards. • Financing: the AllianceNRG Program provides financing for improvements. Using the program's online platform, property owners can apply and receive funding for qualified improvements and contractors can apply to become Registered Professionals. This provides a direct path to secure financing.
Funding Terms	• The term of repayment is based on the "useful life of the improvement"
Program Results	• Through the FPFA's PACE programs, a total of 79 buildings in the state were retrofitted, with total PACE investment in Florida totaling $13.3 million as of 2017.[45]

[45] PACENation (2017). Economic, Energy, and Environmental Impact Report.

Program	Kentucky PACE – EPAD Program (Louisville)
General Description & Administration	• Louisville's Energy Project Assessment District (EPAD) program is administered by the Louisville Metro Government (LMG) Office of Sustainability, which may, at any point, engage a third party to assist with program administration.
PACE-Enabling Legislation	• Legislation passed in 2015
Program Launch	• 2015
Eligible Properties	• Commercial, industrial, and residential (5+ multi-unit)
Eligible Measures	• Energy efficiency, water conservation, renewable energy systems

Funding Mechanism & Financing	• EPAD capital comes entirely from private sources
	• Financing: Local municipality collects assessment, which is then directed to the bank or bond investor
	  ○ Rate of interest on the financing is established by the project's lender
	  ○ Admin fees are charged to each successful energy project

Funding Terms	• Financing available up to 25 years
Program Results	• Program resulted in $5.2 million in C-PACE investment[46]

[46] PACENation (2017). Economic, Energy, and Environmental Impact Report.

Program	Michigan PACE – Lean and Green Michigan
General Description & Administration	• Lean and Green Michigan administers the Lean and Green PACE program in Michigan. • The push for a statewide program was driven by Lean and Green Michigan, which partners with municipalities across the state to offer PACE financing municipalities informally designates Lean and Green to be the program administrator).
PACE-Enabling Legislation	• Michigan passed its PACE-enabling legislation in 2010
Program Launch	• 2013
Eligible Properties	• Commercial, industrial, agricultural, private non-profits (churches, hospitals, private schools and colleges), multi-family (exceptions – single family homes and government buildings)
Eligible Measures	• Energy efficiency, water conservation, and renewable energy measures

Funding Mechanism & Financing	• Private funding sources
	• Financing: The municipality is not required to make payments for initiating the PACE program or for ongoing program administration. The municipality also bears no financial risk and has the right to replace Lean and Green as the administrator at any time.
	  ○ Participating municipalities are responsible for placing PACE assessments on the tax rolls and collecting and distributing PACE assessment payments.
	  ○ Program administration and expansion costs are covered by administrative fees placed on transactions.

Funding Terms	• Funding terms of up to 25 years[47]
Program Results	• As of September 2018, Lean and Green covers 36 counties, cities and townships. This includes 7 of the 10 most populous counties in the state. • Program results have shown success, with the total PACE investment within the state standing at $7.4 million as of 2017.[48]

[47] Lean and Green Michigan (2019).
[48] PACENation. 2017. Economic, Energy, and Environmental Impact Report. Retrieved from: https://app.box.com/file/345899764517

Program	MinnPACE Program
General Description & Administration	• The MinnPACE program is administered by St. Paul Port Authority, which is a non-profit government agency. • MinnPACE has established joint powers agreements with /cities across the state. These agreements outline the Port Authority's role in administering the program. • The Port Authority's role involves engaging with counties in the state and signing agreements (for granting authorization to administer assessments), working with businesses and applicants, processing applications, and issuing funding payments for upgrades. • Local governments are responsible for formally approving the assessment, upon notice of approval by MinnPACE.
PACE-Enabling Legislation	• In 2010, the Minnesota Legislature passed PACE-enabling legislation, which permitted both commercial and residential PACE programs to begin operating in Minnesota.[49] • The legislation stipulates that any entity in the state can be an administrator (this can be municipalities, non-profits, etc.)
Program Launch	• 2013
Eligible Properties	• Commercial, industrial, nonprofit, and multifamily housing
Eligible Measures	• Energy efficiency upgrades and renewable energy investments
Funding Mechanism & Financing	• St. Paul Port Authority receives funding from a number of sources: grants, interest income from loans products, fees billed for services and St. Paul tax levies, and private lenders. • The Department of Commerce provided the Port Authority with $17 million as a grant, which is used to lend money. Port Authority charges 5% interest and splits it with the Department of Commerce, which receives 2.5% interest on the outstanding loans. The interest that is charged pays for the administrative costs of the program. • MinnPACE will also secure funding from a third-party lender. • Financing: the Port Authority has the ability to issue bonds but as of 2018, there has been no instance of funding being issued through bonds. ○ After project approval, MinnPACE provides financing directly to the building owner. The local government also adds the assessment to the tax rolls.

[49] Red Wind Port Authority (2018). MinnPACE: A Financing Resource for Energy Improvements.

Funding Terms	• Up to 20 years
Program results	• In total, there have been 130 buildings improved using the PACE program in Minnesota. • Total PACE investment in the state is approximately $41.8 million, which represents 7.1 percent of all PACE investment in the United States as of 2017.[50]

Program	**Energize New York PACE Program**
General Description & Administration	• The Energy Improvement Corporation (EIC) is a Local Development corporation and a New York State not-for-profit, which offers the Energize NY PACE Financing Program. The EIC is made entirely up of members, including the town mayor, town supervisors, municipal representatives, and county executives. • The EIC primarily performs administrative and project qualification tasks, including all aspects of approving finance applications and securing capital to fund PACE financings. The program has been a key driver for municipal governments that are resource-constrained. • New York municipalities can join EIC by passing a local law, signing a Municipal Agreement codifying the tax charge transfer, and requesting membership. • Municipal members are responsible for physically adding the Energy Improvement Charges to applicable property tax bills, collecting the tax payments from property owners, and remitting the total annual Energy Improvement Charges to EIC's trustee (municipality sends cheque to Bank of America).
PACE-Enabling Legislation	• New York passed PACE-enabling legislation in 2009
Program Launch	• 2014
Eligible Properties	• Commercial, industrial, nonprofit, schools, institutional
Eligible Measures	• Energy efficiency upgrades, renewable energy investments, and demand management (battery storage, thermal storage, and fuel cells)

[50] PACENation (2017). Economic, Energy, and Environmental Impact Report. Retrieved from: https://app.box.com/file/345899764517

Financing	• The main initial funding sources for the program came from the US Department of Energy Better Buildings Program and the New York State Energy Research and Development Authority (NYSERDA). • Financing: EIC financing is done through the issuance of bonds, which are purchased by the Bank of America (which has been the largest partner so far, committing $75 million to the purchase of the bonds). • Municipalities collect the prepayment of the bonds through a line on a property tax bill. They then reimburse that money to the trustee that's entrusted in control of the funds, and then pay the purchaser of the bonds back (Bank of America). • The PACE financing is repaid through the Energy Improvement Charge that is listed on the property tax bill and is collected in the same manner and at the same time as real property taxes and is placed on the tax bill each year that the PACE financing is outstanding.
Funding Terms	• Financing for up to 20 years
Program results	• The total number of buildings improved through New York's PACE program is 18, with $2.6 million of total C-PACE investment.[51]

[51] PACENation (2017). Economic, Energy, and Environmental Impact Report.

Program	Texas PACE Authority
General Description & Administration	• The Texas PACE Authority, a non-profit organization, was created specifically to streamline the creation of PACE programs in Texas. • The primary activity of the Texas PACE Authority is to process applications for PACE funding. The Authority also provides municipalities with a toolkit containing all the materials a municipality would need to establish a PACE program. • A municipality or county can choose to administer the program in-house or acquire the assistance of a third-party administrator for all or part of the administrative duties. • Any municipality in Texas can establish a PACE district by preparing a public report and passing a resolution to establish a local PACE program.
PACE-Enabling Legislation	• Texas enacted PACE-enabling legislation in 2013 • The state's enabling legislation limits the types of institutions that can provide funding for PACE assessments
Program Launch	• 2013
Eligible Properties	• Commercial, industrial, office, multifamily housing (5 + units), nonprofit, houses of worship, agricultural, private schools
Eligible Measures	• Energy efficiency measures, water conservation, renewable energy measures
Funding Mechanism & Financing	• Examples of eligible lenders include: any federally insured depository institution such as a bank, savings bank, savings and loan association and federal or state credit unions; any insurance company authorized to conduct business in one or more states; any registered investment company, registered business development company, or a small business investment company; any publicly traded entity; or any private entity that has a minimum net worth of $5 million and can provide independent certification as to availability of funds. • Financing: once a project is complete, the local government has several options for billing property owners for PACE assessment payments and distributing payments to the program administrator. This function can be performed within the municipality or can be contracted out to another municipality or third-party servicer.
Funding Terms	• Depending on the improvements, repayment period ranges from 10-25 years.[52]

[52] Texas Pace Authority (2017).

Program Results	• Through its PACE programs, Texas Port Authority has invested in approximately $33.6 million in financing for PACE projects, representing almost 6 percent of total PACE investments across the United States.[53]

Program	Virginia PACE Program (Arlington)
General Description & Administration	• Arlington County Board bears the responsibility of authorizing and overseeing the operation of the program. The County Board selected Sustainable Real Estate Solutions (SRS) to serve as the independent administrator of the C-PACE program. • SRS' mandate is to handle outreach, education, project underwriting and quality assurance services. • The County of Arlington opted to outsource the administrative work for their C-PACE program to a third-party.
PACE-Enabling Legislation	• The State of Virginia passed their PACE-enabling legislation in 2009. • Legislation gave localities the authority to offer private lending institutions the opportunity to participate in local loan programs.
Program Launch	• 2017
Eligible Properties	• Commercial, industrial, nonprofit (houses of worship, private schools), multifamily residential (with 5+ units)
Eligible Measures	• Energy efficiency, water conservation measures, and renewable energy systems
Funding Mechanism & Financing	• Funding provided by private capital providers. • Financing: The Arlington C-PACE program is self-financed through program fees charged to participating property owners. The fees cover the startup and recurring costs associated with designing and administering the program.
Funding Terms	• Long-term financing up to 25 years available.[54]
Program Results	• The C-PACE program has been used to install 252 kW solar PV systems and high-efficiency lighting, resulting in projected savings of $90,000 annually.[55]

[53] PACENation (2017). Economic, Energy, and Environmental Impact Report.
[54] Arlington PACE (2019).
[55] Arlington Virginia (2019).

Appendix C - Workshop Participant List

Name	Job Title	Municipality
Mike Mayes	Director of Financial Services/Treasurer	Town of Newmarket
Anatonietta Mollicone	Senior Solicitor	Town of Newmarket
Tony Iacobelli	Manager of Environmental Sustainability	City of Vaughan
Scott Vokey	Director Solutions Development Canadian Municipal Sector	AMERESCO
David Potter	Chief Building Official	Newmarket
Nayel Halim	Project Coordinator	Ontario Climate Consortium
Stuart Galloway	CEO	Energy Services Association of Canada
Bonny Tam	Manager, Tax and Intergovernmental Revenue	York Region
Finuzza Mongiovi	Legal Counsel	City of Vaughan
Meghan White	Planner	Town of Newmarket
Adir Glikson	Community Energy Planning Intern	Town of Newmarket
Shane Manson	Senior Manager, Revenue & Property Tax	City of Markham
Kevin Yarakavitz	Financial Business Analyst for Finance and Innovation and Strategic Initiatives	Town of Newmarket
Gaby Kalapos	Executive Director	Clean Air Partnership
Rick Nethery	Director of Planning and Building Services	Town of Newmarket
Vanessa Cipriani	Project Coordinator	Clean Air Partnership
Fabrizio Filippazzo	Manager of Development Financing	York Region
Maureen Zabiuk	Manager of Property Tax and Assessment	City of Vaughan
Scott Pasternak	Solicitor	City of Toronto
Stewart Dutfield	Program Manager, Public Energy Initiatives - Existing Building, Home Energy Loan Program (HELP)	City of Toronto
Rija Rasul	Energy & Climate Change Analyst	City of Vaughan
Kevin Behan	Deputy Director	Clean Air Partnership
Rita Selvaggi	Manager, Financial Planning and Analysis	City of Vaughan

Jennifer Wong	Sustainability Coordinator	City of Markham
Bill Kiru	Director of Policy Planning & Environmental Sustainability	City of Vaughan
Fariha Husain	Project Manager, Tower & Neighbourhood Revitalization	City of Toronto
Teresa Cline	Program Manager, Climate Change	York Region
Kristina Dokoska	Project Coordinator	Ontario Climate Consortium
Maggie Wang	Manager, Corporate Financial Planning & Analysis	City of Vaughan
David Cohen	Revenue Policy Advisor	York Region
Jenessa Doherty	Coordinator	Ontario Climate Consortium
Julius Lindsay	Project Manager, Climate Change	Town of Richmond Hill
Ian McVey	Senior Program Manager	Ontario Climate Consortium
Karen Farbridge	Principal	Karen Farbridge and Associates
Rob Kerr	Principal	Robert J Kerr and Associates

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