

**Study Report for a
Home Energy Retrofit Program
in the City of Vaughan
Using Local Improvement Charges Financing**

Acknowledgments

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This document is one of three reports that comprise Vaughan's study of the use of Local Improvement Charges to accelerate energy retrofits in private buildings. The three study reports are: a main study report; model by-law and forms; and a business case.

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1. Building Energy Retrofit Program Purpose

1.1 Background

The City of Vaughan's Municipal Energy Plan (MEP) establishes that the residential building sector is the largest consumer of energy (approximately 37% of total) and largest source of greenhouse gas (GHG) emissions (35% of total) in the City based on 2013 energy consumption data. Energy and emissions in the residential building sector are largely concentrated in the City of Vaughan's single-family home subsector where 98% of homes were constructed prior to the 2012 Ontario Building Code. The MEP furthermore establishes that household energy use in Vaughan is ~40% higher than the Ontario and Canada-wide average household energy consumption as reported by Natural Resources Canada.

Improving the energy efficiency of Vaughan's residential building stock through a municipal-endorsed retrofit program is one of the key strategies to meet GHG emissions reduction targets, help residents reduce their energy costs, and support local job creation. The C40 Cities Deadline 2020 report (ARUP and C40 Cities 2016) also emphasizes the importance of building retrofits, for both the commercial and residential sectors, as a key strategy in their blueprint for climate action.

Many factors prevent the open market for energy efficiency retrofits from achieving its full potential. Government and utility incentives have attempted to remove some market barriers, however multi-faceted barriers have historically inhibited the success of residential energy efficiency retrofit programs, including:

- A payback period longer than the time a homeowner intends to remain in the home
- Inability to acquire financing, or unattractive financing terms
- Complexity of incentive programs
- Delays between project completion, and receipt of incentive payments

Enabled by 2012 changes to the *Municipal Act, 2001*, Ontario municipalities are now permitted to use the local improvement charge (LIC) mechanism (Ontario Regulation 586/06 as amended by Ontario Regulation 322/12) to provide financing to private property owners for energy-related projects. The City of Toronto has been operating an LIC-based home energy loan program since 2014, and the Toronto City Council has recently updated the program to expand the list of eligible energy retrofit measures.

This report lays out the details of how a City-wide, LIC-based residential energy efficiency retrofit program would work in Vaughan.

Goals

The goals of Vaughan's residential building retrofit strategy are listed below.

1. **Deep energy retrofits:** enable high penetration of deep energy retrofits in the almost 80,000 single-detached dwelling units in Vaughan;
2. **Homeowner goals:** enhanced property value, reduced energy costs, and increased comfort;
3. **MEP goals:** reduction of energy use and GHG emissions;
4. **Broader city goals:** economic development, provision of high-quality employment, and minimal financial risk;
5. **Investor goals:** acceptable returns based on the associated investment risk;
6. **Retrofit contractor goals:** high-volume, predictable retrofit project flow with equal or better margin than the current remodeling market;
7. **Strategic material partner goals:** new market development, significant incremental sales volume, and reduced selling expense; potential for further enhancing market development by duplicating the energy retrofit model in other communities;
8. **Electric, gas, and water utility goals:** meet or exceed the efficiency targets of utility incentive programs;
9. **Community goals:** improved neighbourhoods;
10. **Key process goal:** implement the program within current regulatory constraints;
11. **National goals:** contribute to GHG emission reductions as part of the Federal Pan-Canadian Framework on Clean Growth and Climate Change.

1.2 Summary of Study Process

This report builds on research that involved a municipal scan of 16 property-assessed financing mechanisms across North America, including the City of Toronto's Home Energy Loan Program. This research helped to shape the parameters, internal logistics, program criteria, and other varying details of the LIC framework proposed for implementation in the City of Vaughan.

The recommendations outlined in this report were also informed by a risk assessment workshop that was conducted in April 2019 with finance and legal staff from the City of Vaughan, York Region and other lower tier municipalities in the Region (Newmarket and Markham).

- The risk assessment identified limited municipal resources, scalability, ensuring compliance with the LIC Ontario regulation (O. Reg. 586/06), and negative impact on internal processes as the main high-level risks associated with program implementation.
- Some suggested strategies to address the risks were also identified. These include utilizing risk mitigation strategies such as ensuring strong public and stakeholder engagement, developing a robust business case for the program, and recovering up-front costs through external grant funding.

The risk analysis phase was subsequently followed by a stakeholder consultation phase that included contributions from staff across sectors such as utilities, social enterprise groups, the Provincial government and municipal governments, renovators, and private sector energy service providers to engage participants in evaluating LIC program design elements. The stakeholder sessions gathered valuable feedback to help inform the implementation of an energy retrofit program using the LIC financing mechanism.

The findings also helped to support and inform the development of the final phase, which includes developing this study Report outlining the proposed program design components, administrative roles and responsibilities, homeowner application procedures and protocols, financing/funding options, potential pathways for scaling up the pilot program, and model by-laws and contract forms. A summary of the study process is shown in the table below.

Table 1 *City of Vaughan Local Improvement Charge Operational Study – Project Overview*

Phase	Deliverables and Objectives	Timeline
1) Synthesis Report	<ul style="list-style-type: none"> Through research on existing LIC/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 – Risk Analysis Phase	<ul style="list-style-type: none"> Conduct a design-thinking workshop with municipal staff, informing the Synthesis Report, to understand risk profiles and mitigation options associated with various program designs. Collaboratively develop a risk profile, and mitigation options, for a set of LIC/PACE program models in the York Region municipal context, including upper tier/lower tier governance and financing issues. 	April 2019
3) Stakeholder Consultation and Developing City of Vaughan LIC Study Report	<ul style="list-style-type: none"> Stakeholder consultation sessions to evaluate program design elements and provide feedback. Develop a LIC Study Report including proposed program design components, administrative roles and processes, application procedures and protocols, and model by-laws and contract forms to increase the capacity of the City of Vaughan to develop and implement a LIC financing program. 	December 2019
4) Final Study Report, Business Case, and Model By-law and Forms	<ul style="list-style-type: none"> Draft a municipal toolkit including a generic model By-law and program forms for Council consideration to enable a LIC financing program in the City of Vaughan. 	March 2020

1.3 Vaughan's Housing Profile

A large majority of Vaughan's building stock is comprised of single-family detached homes (71%). Single-family row/townhouses, single-family semi-detached houses and multi-unit residential buildings make up the rest of the building stock in fairly equal amounts (9 to 10.5%). According to Statistics Canada, single-detached dwellings have the highest average household energy use in Ontario at 136 GJ per household.¹ Homes built after 2010 adhere to the more stringent 2012 Ontario Building Code and are more energy efficient. However, these homes make up a small percentage (8.5%) of total housing stock in Vaughan. This implies that a significant percentage of Vaughan's building stock is viable for retrofits, thereby demonstrating potential for significant energy and emissions reductions.

Table 2 Number of residential dwellings built in the specified time period (2013 data).

Building Age	Count
Pre-1945	376
1945-1969	1,674
1970-1979	3,024
1980-1989	22,350
1990-1999	18,170
2000-2009	34,209
2010-2013	7,391

¹ Vaughan Municipal Energy Plan (2016).

2. Resolution Establishing a Program: Key Details and Considerations

2.1 Program Overview

The potential Vaughan LIC program is designed to finance consenting homeowners for the installation of qualifying energy and water conservation improvements, and may include related energy assessments, and then to secure payment by imposing a local improvement charge on the private residential property (as authorized by a by-law in accordance with O. Reg. 586/06 as amended by O. Reg. 322/12).

2.2 Program Eligibility

Residential low-rise buildings located within the City of Vaughan of the following forms are proposed to be eligible for the initial launch of an LIC program: detached, semi-detached, and townhouse. The property owner must have a property tax account with the City of Vaughan and must also be a customer of either Alectra Utilities and/or Enbridge Gas.

Participation is voluntary, owner-initiated and subject to the following conditions:

- **Ownership:** All owners of the property must consent to the arrangement
- **Current on obligations:** Property tax, utility bills and all other payment obligations to the City for the past five years must be in good standing
- **Lender awareness/consent:** evidence that all mortgage lenders have been notified or have consented to the imposition of a priority lien related to the LIC-based financing
- **Proposed retrofit measures are consistent with implementing by-law:** the proposed retrofit measures submitted by the applicant/owner are consistent with those specified in the implementing by-law

The following additional criteria are recommended:

- Have a title that is not in dispute
- Be located within the jurisdiction of the LIC Program (Vaughan)

2.3 Eligible Improvements

O. Reg. 586/06 permits a local improvement charge on properties to be placed for 'constructing any works for the ... distribution or conservation of water' (Clause 1 (2) (b) of the Regulation) and 'constructing energy efficiency works or renewable energy works' (Clause 1 (2) (q) as amended by O. Reg. 322/12). Municipalities are required to implement enabling by-laws to specify the details regarding owner and project eligibilities.

The following criteria are recommended for eligible improvements based on O. Reg. 586/06 as well as building retrofit strategies implemented in other jurisdictions and carbon reduction strategies outlined by the Intergovernmental Panel on Climate Change and C40 Cities.

- **Improvements are consistent with the public purpose**

The building retrofit measures, in aggregate, result in the reduction of energy costs, enhancement of property values, enhancement of employment opportunities, reduction in greenhouse gas (GHG) emissions, economic stimulation and development, and the conservation of water resources.

Examples of building improvements can include:

- Thermal envelope upgrades: attic, wall and basement insulation, window and door replacements, air-sealing.
 - Mechanical systems (space heating and cooling): high efficiency furnace, boiler and air conditioner replacement, thermostats and controllers, air source heat pumps, ground source heat pumps.
 - Mechanical systems (water heating): high-efficiency water heaters (e.g., hybrid heat pump, tankless, etc.), drain water heat recovery systems, solar hot water systems.
 - Renewable energy and energy storage: solar photovoltaic systems, electric vehicle charging stations (Level 2), battery storage devices.
 - Water efficiency: low-flow toilets, hot water circulation pump and system, greywater treatment system, closed-loop shower water recovery system, rainwater harvesting system (subject to eligibility criteria).
- **Improvements are permanently fixed to the real property**
Various clauses in the Regulation specify 'the estimated lifetime of the work'.
 - **Expected savings**
Include stipulations that require projects to demonstrate energy savings over a certain threshold and/or GHG reductions.
 - Measures must demonstrate capacity to decrease:
 - Water consumption or demand;
 - GHG emissions (e.g. by reducing energy demand through efficiency improvements or fuel-switching, such as using an air source heat pump to reduce or eliminate the use of natural gas for space heating).
 - **Have a useful life that exceeds the term of the LIC financing agreement**

Ineligible measures: include equipment or products not permanently affixed to the property, previously installed in another home, and/or are deemed general maintenance.

2.4 Neighbourhood Selection Process

The City may establish criteria or stipulations within the enabling by-law / business case to target specific neighbourhoods for property-assessed financing retrofits.

The City of Vaughan's 2016 Municipal Energy Plan (MEP) outlines priority neighborhoods that have high residential energy consumption rates. These are termed as **Energy Planning Districts (EPD)** and were created using an inventory of all properties and built floor space categorized based on building type and age (see Figure 1).²

- EPDs can allow City departments to better correlate between the maps and future planning initiatives (e.g., EPDs with higher residential energy consumption and older dwelling units can be prioritized for area-specific retrofit programs ahead of EPDs that have relatively lower energy consumption). These districts comprise of a housing stock predominantly built in the 1975-1989 range.

Suggested criteria for the initial energy retrofit program should consider the following guidelines:

- Prioritize EPDs with the highest energy intensity (highest utility-calculated natural gas and electricity end-use consumption)
 - EPD1 and EPD8 stand out as the highest priority areas in Vaughan with respect to electricity usage and are highlighted as prime targets for retrofit programs in Vaughan's MEP (2016).
- Target community should have a higher average number of pre 1989 building vintages and uniform building types
- Consider varying demographic and socio-economic characteristics (i.e., low income neighbourhoods) to ensure a diversity of households are targeted
- Existing community initiatives or organizations interested in being aligned with the Program to achieve efficiencies in terms of program delivery (i.e. marketing and outreach support).

It is recommended that the City monitor Program uptake within pilot communities during the implementation of the Program. If appropriate, the Program may be rolled out City-wide to achieve greater scale and GHG reduction targets (while operating within the City Council approved budget).

² City of Vaughan Municipal Energy Plan (2016).

Figure 1 Vaughan MEP Total Energy Residential (2016)

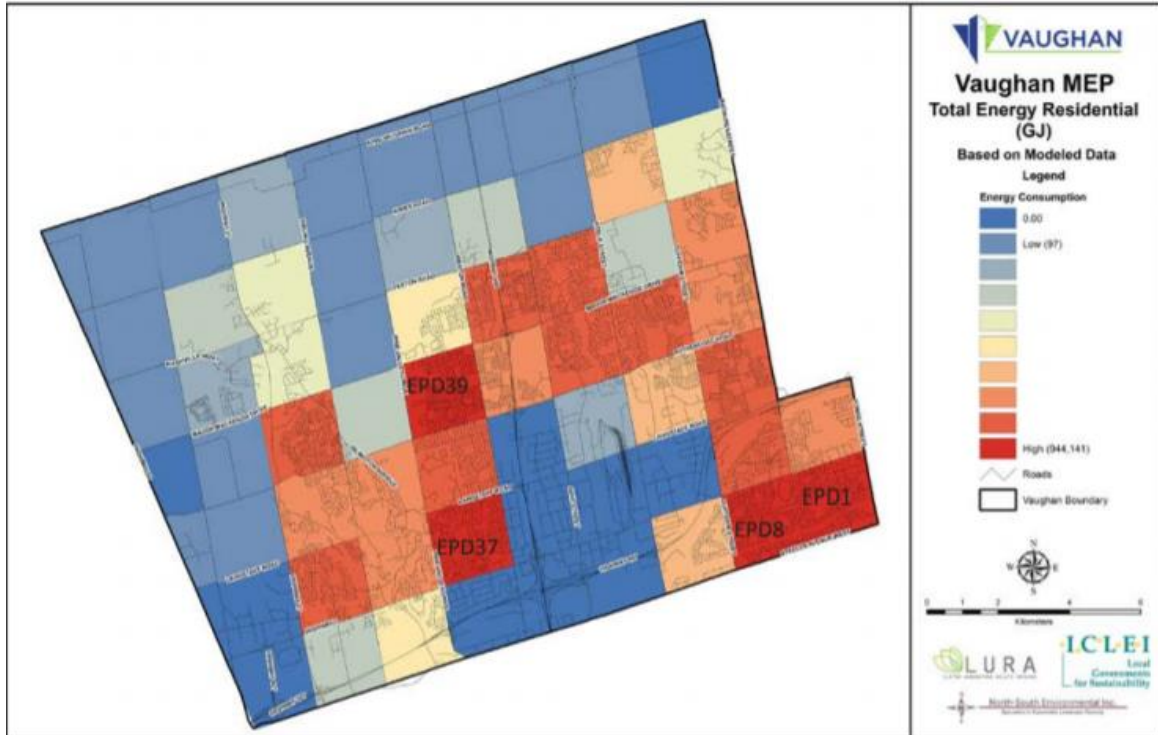


Table 3 Residential Energy Consumption – Intensity Figures for EPD1, 8, 37, & 39 (2016 MEP)

EPD	Total Residential Energy Consumption (GJ)	Gross Floor Area, Residential (m ²)	Energy Intensity (GJ/m ²)
1	944,141	1,582,219	0.597
8	939,530	1,607,754	0.584
37	854,688	1,569,442	0.545
39	828,379	1,771,860	0.468

2.5 Administrative Models

Limited municipal resources, both in terms of staff and financing, was identified as a major risk during the risk assessment phase of the Study. As a result, the project team focused on three program models to mitigate this risk: 1) **Municipal self-administered model**, 2) **Municipally-owned entity model**, and 3) **Third Party model**. The risk analysis workshop, held primarily with municipal staff, also assessed the risks associated with each model.

The table below summarizes the program models and the risks identified for each.

Table 4 Program Models and Risks Identified

Program Model	Description	Risks Identified
Municipal self-administered	<p>Legal Structure - 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.</p> <p>Operational Leadership and Governance - City staff will provide operational leadership and governance is provided directly via municipal Council.</p> <p>Examples – City of Toronto’s HELP and Hi-RIS Programs</p>	<ul style="list-style-type: none"> ● Limited volume of financing ● Scalability ● Issues due to competing priorities for capital and resources ● Negative impact on internal processes and workload related to tax roll adjustments ● Difficult for smaller municipalities to deliver
Municipally-owned entity (Municipal Services Corporation)	<p>Legal Structure - municipality establishes a Municipal Services Corporation (MSC) to administer/operate the program, potentially in collaboration with other municipalities.</p> <p>Operational Leadership and Governance - program governance provided by the MSC board.</p> <p>Example – California Joint-Powers Authority model</p>	<ul style="list-style-type: none"> ● Failure to establish an effective governance structure (given that municipalities have limited experience with MSCs) ● Non-compliance with Ontario’s regulation regarding MSCs (O. Reg. 599/06) ● Additional resources required to establish governance and operational systems ● Potentially lengthy process to establish entity
Third Party	<p>Legal Structure - the municipality outsources aspects of administration and operations to a Third Party entity.</p> <p>Operational Leadership and Governance - program governance provided by Senior Staff and Council. This can be applied to a single or multi-municipal model.</p> <p>Example – Clean Foundation’s LIC program in Nova Scotia</p>	<ul style="list-style-type: none"> ● Less operational control ● Limited volume of financing ● Competing priorities for municipal capital

In examining the risks identified during the workshop, it is recommended that the City work towards the Third Party model for the implementation of the initial pilot given its lower risk profile. However, it is suggested that the City utilize mitigation strategies to address the identified risks moving forward. In addressing competing priorities for municipal capital, the City can ensure strong public and stakeholder engagement, develop a robust business case for the program, and plan to recoup up-front municipal capitalization and/or seek grant funding. These strategies are outlined in **Section 3 - Program Capitalization**. If transaction volume is low, administration fees on each individual transaction can be applied to recover costs.

With the Third Party model, a Program Administrator is delegated the role of administering the front-end tasks such as pre-qualifying applicants and providing customer service. This allows the City to scope staff efforts for the back-end operations that include, at a minimum: processing tax payments, issuing payments, and placing liens on properties. This helps to reduce the burden on municipal resources.

City of Vaughan's key functions include:

- **Administrative processes:** implement by-law, contract document development, financial and technical underwriting. Staff capacity, including legal and technical expertise, will be required.
- **Financing:** servicing LIC assessments (billing, collections), advancing financing to property owners, and recording priority lien on the property. These functions can be performed by the municipal tax department and legal services department.

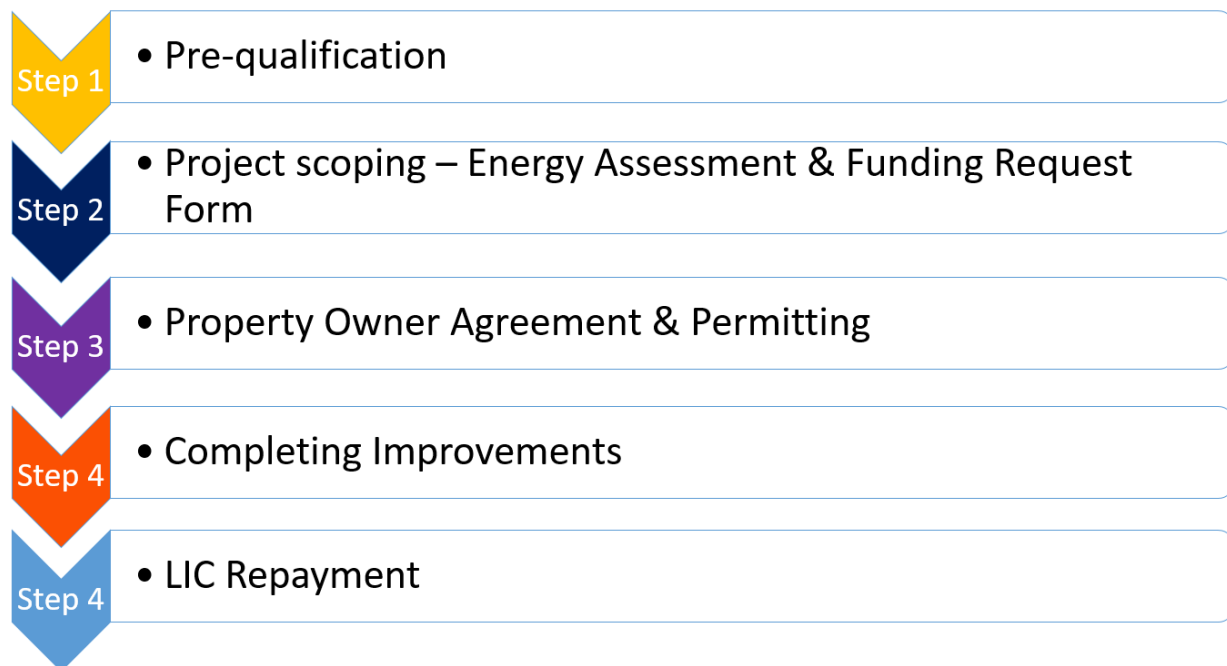
Program Administrator/ Third Party organization's key functions include:

- **Administrative processes:** pre-qualification, issuing Notice to Proceed, application approvals (review and verification), prepare property owner agreement, marketing and outreach, customer service, IT activities.
- **Energy assessment and quality assurance:** pre-qualification energy audit, provide homeowners with guidance on engaging contractors, verify project completion and post audit. Periodic or routine inspection of projects is also recommended to ensure that contractors do quality work and can instill confidence among participants. Specifically, these tasks are to be conducted by third parties with expertise in building science.

A detailed breakdown of these key functions is provided in the following sections of this report.

2.6 Application Process

A list of recommended application steps and details are provided below. Roles and responsibilities are also outlined. References in the text below to a 'Program Administrator' refers to an organization that provides the administrative services primarily regarding the applicant process. Reference to a 'Third-Party Entity' generally refers to an entity whose primary function is to secure financing or funding to be used for the LIC financing mechanism.



Step 1: Pre-qualification (Program Administrator)

- The application will be developed and reviewed through a website securely attached to an automated database (see model application under separate cover).
 - A web-based pre-application tool can help potential applicants to test their proposed projects against application requirements in advance to determine whether the proposed projects qualifies and, if so, what additional information and tasks will be required for the application process.
 - This tool could also assist property owners in estimating the non-project costs such as interest charges, application fees, long-term measurement and verification, and other related project costs to determine the anticipated return on investment.
 - A pre-application check list and cost estimator would help owners to ensure the effective implementation of retrofit measures, provide

contractors with relevant information readily (e.g., current baseline conditions and specifications of furnace/insulation), and estimate retrofit costs. The pre-application checklist can be provided on the program website.

- Homeowners submit the online application form that includes, but is not limited to, the following information:
 - Property address to confirm the location is within the eligible jurisdiction area
 - Property assessment roll number to confirm no outstanding payments owed to the City in the last five years on the property tax account
 - Property owners will provide verification that they have informed their mortgage lender(s) about their intention to participate in the Program by submitting a written notice (Model Mortgage Lender Notice Form under separate cover)

- Once the application is reviewed and the owner has been prequalified by the Program Administrator, based on the above criteria, the Program Administrator will provide a pre-qualification **Notice to Proceed** letter to the property owner (model Notice to Proceed letter provided under separate cover).

Step 2: Project Scoping - Energy Assessment and Funding Request Form (Program Administrator)

Energy Assessment

The project scoping process begins when a property owner, together with their consulting engineer, contractor or Certified Energy Advisor (CEA), study a proposed project's scope and potential water and/or energy savings.

- The Program Administrator will provide customer service support and guidance on contractor engagement.
 - It is recommended that contractor resources be provided to participants on the program website. This may include a list of recommended contractors and contact information.
 - **Note:** neither the Program Administrator nor the City of Vaughan are responsible for the work quality of any contractors and assume no liability for the work undertaken.
 - It is **strongly** recommended that homeowners select contractors who are licensed to operate in the City of Vaughan, insured and who offer warranties that are in keeping with the industry standard. These points are to be stated in a disclaimer placed on the website.
 - Contractor outreach, such as training webinars and workshops, may also be provided on the program to promote consistency with retrofit implementation.

- A contractor information kit will also be provided on the website to help contractors spread the word about the program. This includes brochures, images, and poster materials.
- Each proposed project must be reviewed by a qualified auditor, certified by Natural Resources Canada, to conduct a home energy assessment that includes the property's current water and/or energy baseline conditions and the projected water and/or energy savings expected after project implementation. A contractor(s) may analyze the home energy assessment and conduct site visits to ensure that the projected savings identified in the audit are valid and reasonable.
- If the homeowner has already completed a home energy assessment in the last 12 months and has not completed any upgrades to their home since the assessment, they may be able to participate in the program without obtaining a new home energy assessment.
- The homeowner completes the pre-retrofit home energy assessment and submits to the Program Administrator the **Energy Assessment Report**.

The Energy Assessment Report must include:

- The current Natural Resources Canada EnerGuide rating for the home
- Recommended improvements that have been customized for the home based on existing conditions which could potentially increase the NR Can EnerGuide rating of the home
- The estimated useful life of the proposed improvement(s)
- Estimated energy cost savings that may be realized after installing the recommended improvements
- Potential eligibility for utility rebates and incentives offered by Alectra Utilities and Enbridge Gas

The City may consider waiving the requirement for an energy assessment for projects under a certain cost. The City of Vancouver, for example, only requires an EnerGuide Home Evaluation for renovation projects over \$5,000 (Environmental Commissioner of Ontario 2019).

Funding Request Form

Along with the Energy Assessment Report, the homeowner also will need to submit a Funding Request Form that:

- Identifies the improvements that the property owner intends to install based on the Energy Assessment Report
- Identifies the cost for each improvement (including equipment, materials, and labour costs)
- In the case of energy and water retrofit measures that are part of a larger renovation, such as a building addition or secondary suite, the cost of the energy

and water retrofits shall be determined for the purposes of the Funding Request Form

- The amount of prepayment (up to a maximum of 10% of the estimated cost of the eligible energy and water retrofit measures) being requested from the City upon signing a Property Owner Agreement (POA)

Following receipt of the Funding Request Form, the Program Administrator will:

- Confirm the eligibility of the works (e.g., items affixed to property)
- Verify the reasonableness of retrofit costs and labour costs by consulting manufacturer pricing and prevailing labour rates
- Calculate the administrative costs using a formula that apportions the cost to the City and Program Administrator to operate this program between participating properties as a percentage of the cost of the work undertaken relative to the percentage of the cost of the work to the overall Program budget
- Estimate the eligible utility rebates and incentives available to the homeowner

The above steps will enable the Program Administrator to derive the funding amount, up to a maximum to be specified in the implementing By-law (e.g., up to 10% of the property's assessed value or a maximum dollar amount) to include in the Property Owner Agreement.

Step 3: Property Owner Agreement and Permitting (Program Administrator and City)

Permitting

- Property owners are required to obtain all necessary local building, electrical, plumbing and other permits, pass all required local inspections, and be in full compliance with applicable codes and standards.
- All work must be performed in accordance with all applicable building codes and standards.
- Copies of permits and other verification that plans are in compliance must be obtained and shared with the City before or at the required time during construction.

After the Program Administrator has confirmed the acceptability of the Energy Assessment Report and the Funding Request Form, a Property Owner Agreement (POA) is prepared for the building owner(s) to review and sign (see model contract included under separate cover).

Step 4: Completing Improvements (Building Owner, City of Vaughan and Program Administrator)

LIC Payments and Installation Verification

1. Initial Funding Disbursement

- Following execution of the POA, the City will provide the homeowner with the initial disbursement agreed upon in the POA (e.g. to a maximum of 10% of the estimated cost of the work) that can be used by the homeowner to pay contractors or suppliers (i.e. security deposit).
- The property owner will be contractually obligated to repay this initial disbursement to the City if the property owner does not complete the improvements.
- The property owner can then proceed with hiring the contractor(s) and performing the approved energy and water retrofits to the property.

2. Final Funding Disbursement

- As will be detailed in the POA, the City will provide the final disbursement only after the homeowner provides a copy of the post-retrofit assessment report from the contractor that:
 - Includes a Certificate of Completion confirming the approved retrofit measures have been installed and provides an EnerGuide rating of the home after the retrofit measures have been completed
 - Demonstrates that the post-retrofit EnerGuide rating is an improvement over the original EnerGuide rating noted on the pre-retrofit assessment report, or that the energy and water retrofit works have reduced the GHG emissions of the building
 - Indicates the actual costs and useful life for all the works

Step 5: LIC Repayment (City of Vaughan)

Repayment Process and Lien Recording

- Following the City Treasurer's, or his/her designate, periodic certification of the local improvement roll, (which occurs after the improvements on a given set of properties are complete and the final amounts of financing are confirmed), the City Solicitor will submit a by-law for Council adoption pursuant to Section 36.14 of O. Reg. 586/06 to impose the special charges on the participating properties.
- For each property included in the by-law, the City Treasurer, or his/her designate, will then add to the City's tax roll for that property each year that portion of the imposed special charge that is due in that year.

- These collective steps will provide priority lien status for the annual amount that the Treasurer adds to the tax roll and will ensure that any subsequent property owner who was not a party to the POA is bound to pay that amount.
- To facilitate repayment of the annual special charge, the POA will require homeowners to sign up for the monthly pre-authorized payment plan option.
- At any time, a homeowner can make advance payments to the tax roll, including a one-time payment that clears the total outstanding amount owing that will clear the LIC charge. Failure to make payments is treated in the same manner as uncollected property taxes which will include penalty and interest charges.

Closing on a Project

- A checklist will ensure that all necessary documents and certifications have been verified prior to closing.

An overview of City, Program Administrator, and property owner roles and responsibilities covering the program application and approval process is shown in **Table 5** and illustrated on a flowchart (Figure 2) on the following pages.

Table 5 *Application process: Municipal roles and responsibilities*

Actions	Who
1. Pre-qualification and online application, notify mortgage holder of intent to participate in program	Property owner
2. Issue Notice to Proceed	Program Administrator
3. Submit energy audit/ assessment & funding request form, Review documentation	Property owner, Program Administrator
4. Submit Energy Assessment Report & Funding Request Form	Property owner
5. Review/ verify application	Program Administrator
6. Prepare Property Owner Agreement, Sign agreement	Program Administrator, Municipality, Property owner
7. Pay initial disbursement	Municipality
8. Retrofit project implementation	Property owner / Contractor(s)
9. Verify project completion, post-audit & submit invoice	Program Administrator, property owner
10. Pay final disbursement	Municipality
11. Pass by-law to impose special charges on property, record priority lien on property, and update tax assessment roll	Municipality
12. Loan repayment over term	Property owner

Figure 2 Program Administrator Model

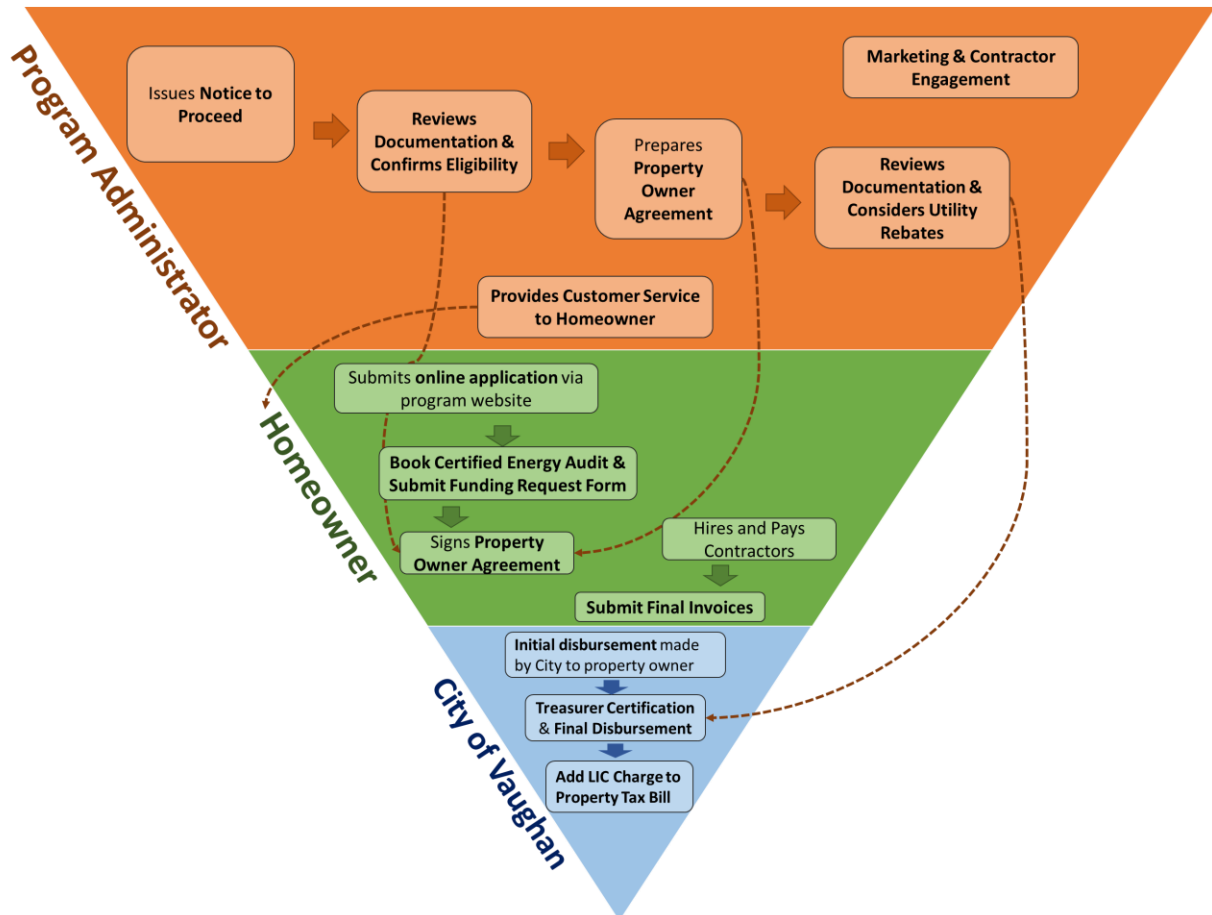
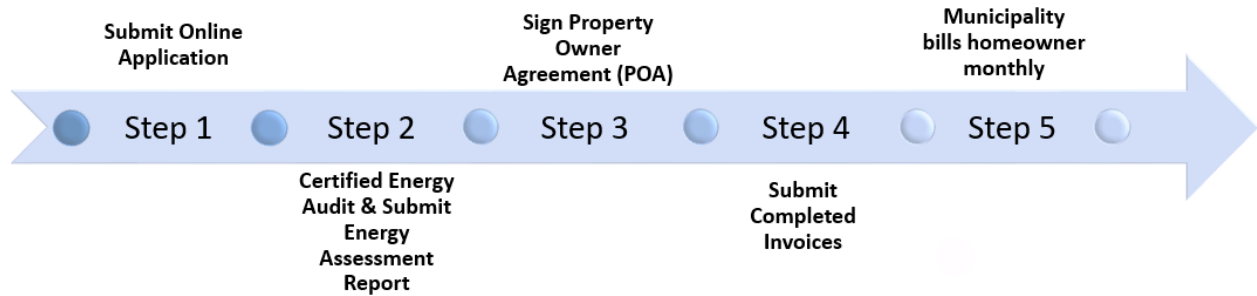


Figure 3 Homeowner LIC Financing Steps

Homeowner Application Process



2.7 Program Reporting and Review

Monitoring and tracking

It is recommended that the City or Program Administrator create a robust project-level monitoring program that monitors program performance and contribution to municipal energy and GHG objectives. The data collected should preferably be stored on a secure online database, recorded and analyzed.

The following key performance measures are recommended for tracking, at a minimum.

Program Uptake and Participation

- Number of applications (totals): submitted, withdrawn, approved, funded, and total project expenditures
- Total number of buildings improved and total square feet

Financing Details

- Term lengths, interest rate, closing costs and debt servicing
- Funding request amount: project total(s)

Project Type and Details

- Energy efficiency (mechanical equipment replacement and/or building envelope improvement), water conservation, renewable energy with or without battery storage, distributed generation, or comprehensive
- Useful life of installed equipment (weighted average of multiple)

Energy Savings

- Energy assessment to identify recommended improvements and estimated cost savings
 - Savings estimates should be evaluated to actual energy and water savings (energy measured in kWh or kW reduction and/or water savings in litres)
- At a minimum, as a means of assurance and quality control, the City reserves the right to have a third-party qualified contractor complete an inspection and verify the completed retrofit measure by producing a commissioning report
- Via the Property Owner Agreement (POA), the City can mandate that the property owner consent to providing the City with access to pre and post property utility data for some period of years (e.g. 3-5 years) as a requirement of program enrollment
 - The property owner(s) also agrees to participate in surveys and other follow-up activities to help the City evaluate the Program

Environmental, Social, and Employment impacts

- Identify the economic development impact such as: the number of jobs created, jobs saved, local companies incentivized not to move, new companies/businesses in area due to LIC financing
- Environmental impacts - GHG reductions for completed projects.

3.0 Program Capitalization

3.1 Financial Mechanisms and Funding Options

3.1.1 Full Program Implementation

Several years will be needed for the program to gain momentum and attract a high number of homeowners (i.e., in the hundreds per year) to apply for the LIC financing mechanism. This requires ongoing education and awareness of the benefits of energy retrofits. Funding for long-term implementation is described below and a near-term program initialization is described in the following section.

Third Party Entity

The risk assessment of the LIC financing mechanism, undertaken as Phase 2 of this Study, addressed the issue of a sustainable financing source for long-term, full implementation. The main recommendation from the risk assessment is to transfer capital financing risk to a Municipal Services Corporation or enter into an agreement with a Third Party Entity to administer the program and secure private capital.

Municipal Services Corporation

A Municipal Services Corporation (MSC) is established under Section 203 of the *Ontario Municipal Act, 2001*. The MSC 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.

Third Party Entity

The Third Party Entity can be a for-profit business, a not-for-profit organization or social enterprise. A municipally-owned or independent Third Party Entity can be capitalized through direct private sector lending.

Municipal Bond Issuance in Upper-tier and Lower-tier Context

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.

3.1.2 Program Initialization

Program initialization can be limited to a specified number of applicants in order to test the LIC financing mechanism, gain familiarity with the program mechanics, and better assess the costs (i.e., staff time, web updates, etc.) associated with the process steps. A municipality can leverage financing from internal reserves, or access funding from external sources.

Municipal financing

Internal reserves

The municipality leverages internal reserve funding to provide the initial working capital to finance home energy retrofit projects, and is subsequently repaid over time from program proceeds. Financing from internal reserves is not currently an option for the City of Vaughan.

Upper-tier debentures

York Region can issue debentures on behalf of the lower-tier municipality. This is an option for an initial program launch that can be financed by a limited amount (e.g., one million to several millions of dollars). However, using debentures for larger amounts of financing raises a concern about affecting the Region's credit rating.

External financing

The City may also access funding from external sources in the form of grants and incentive programs. The following grants and incentives are currently available.

1. FCM Community Eco-Efficiency Acceleration Fund (available in 2020)
 - *“The goal of the Community EcoEfficiency Acceleration Fund is to accelerate community financing for homeowners as they make their homes more affordable and energy efficient. The Fund is estimated to support between 8,000 and 20,000 household energy projects in up to 200 municipalities of all sizes across Canada. This Fund would make this programming accessible and tailored to local conditions—and municipalities are perfectly placed to achieve both. One model that has demonstrated clear community benefits is the Property Assessed Clean Energy (PACE) model.”³*
2. The Atmospheric Fund (TAF)
 - *“Our granting program for high performance buildings prioritizes scalable projects that: demonstrate new approaches to significantly reduce the carbon intensity and increase the energy efficiency of existing buildings, especially multi-unit residential buildings, aiming to reduce the average GHG intensity of large buildings in the GTHA 35% by the year 2030, advance policy and financing approaches to facilitate and scale energy-efficiency retrofits, pilot demonstrations*

³ Federation of Canadian Municipalities. 2019.

of promising energy efficiency and zero-emissions building technologies and management approaches.”⁴

City staff and TAF discussed financing and grant funding options for a pilot or program initialization. TAF described their potential funding interest in the areas of marketing and incentives to help drive uptake and penetration, rather than main capital financing.

3. Natural Resources Canada’s (NRCan) Zero-Emission Vehicle Infrastructure Program

- *“Allocates \$130 million over five years (2019-2024) to deploy a network of zero-emission vehicle charging (level 2 and higher) and refueling stations in more localized areas where Canadians live, work and play. It is important to note that the program will support electric vehicle charging infrastructure deployment in multi-unit residential buildings (MURBs). It must be greater than 3 storeys in building height (i.e. 4 storeys or more) or have a building area (footprint), that is greater than 600m² and have a common entrance.”*

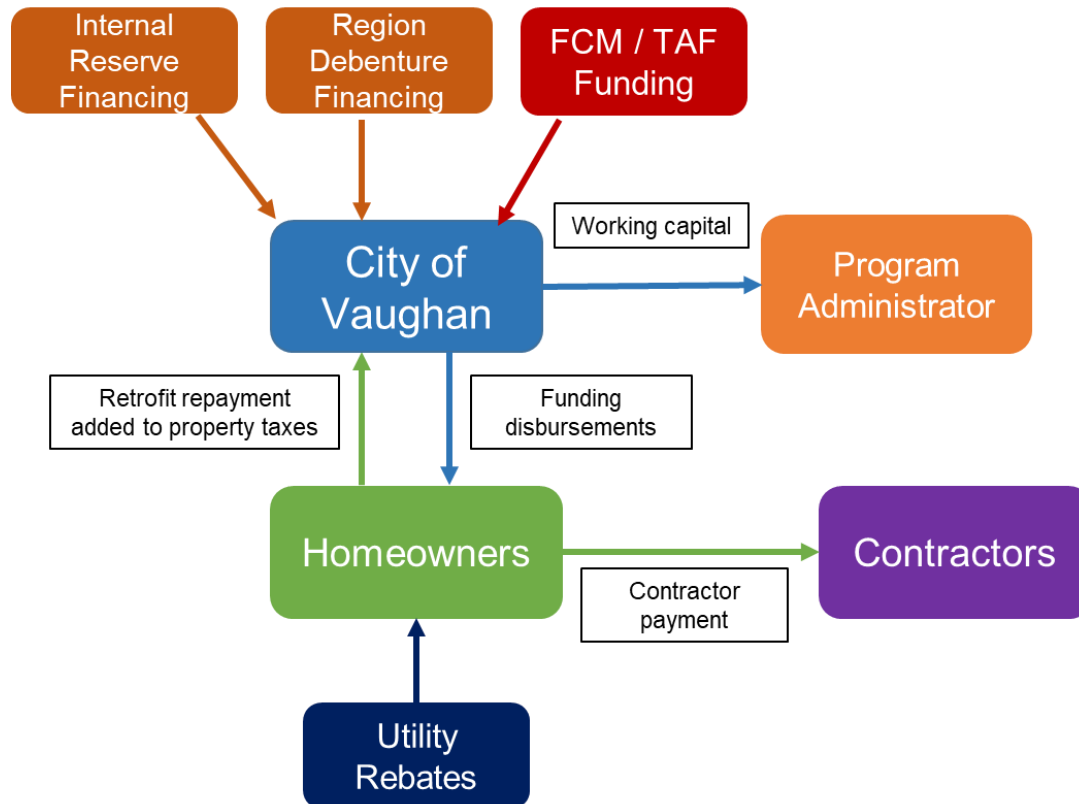
Depending on the business case and program costs, the City may also impose fees to offset the costs of administering the program. An appropriate application fee encourages complete and appropriate filings while discouraging incomplete and unsupported filings. Fees can be charged under section 391 of the *Municipal Act 2001* and may be assessed as:

- Program application fees paid by property owners that cover the cost of reviewing the application
- A component of the interest rate on the assessment in the written contract between the City and the property owner
- A combination of application fees and interest rates

⁴ The Atmospheric Fund. 2019.

LIC Financing Program Funding Flows for Program Initialization

Figure 4 Vaughan Home Energy Retrofit Program Funding Flow for Proposed Model



3.1.3 Incentive Programs

The City can also engage with utility companies to align LIC financing with available incentive programs or rebates. By maximizing use of utility incentives, applicants free up more of the loan to take on deeper energy retrofits.

To ensure effective coordination with incentive programs, the City must engage with utility staff/representatives during the program design process.

Examples of available incentive programs in the City of Vaughan are shown below:

- Enbridge Incentive Program - a homeowner is eligible for a rebate for the cost of an energy assessment of up to \$5000 should a homeowner complete two or more eligible measures.⁵
 - Heating system (furnace or boiler): Up to \$1,000 rebate depending on improvement in efficiency level.

⁵ Enbridge. 2019.

- Upgraded Insulation:
 - Up to \$1,000 for Basement
 - Up to \$2,000 for Exterior Wall
 - Up to \$500 for Attic
 - Natural Gas Water heater: \$200 rebate
 - Window/Door/Skylight: \$40 per
 - Air Sealing: Up to \$150
- Save on Energy Home Assistance Program (IESO) - The program is designed for income-eligible hydro customers to help reduce energy costs and increase home comfort by providing a free in-home visit with a home energy expert and no-cost energy efficiency upgrades which, if applicable, includes insulation and draft proofing.⁶

3.2 Financial Due Diligence Criteria, & Consumer and Lender Protections

3.2.1 Establish Internal Quality Control and Anti-Fraud Measures

As a means of additional oversight to confirm that the funded improvements were completed, it is recommended that the City consider the following program criteria.

- Have a City official or contractor complete an inspection and verify the completed retrofit measure by producing a commissioning report.
- The property owner(s) is also responsible for keeping original copies of contractor invoices and photos of installed measures and be prepared to disclose this information to the City upon request.
- Periodic or routine inspection of projects can help to ensure that contractors do quality work can instill confidence among participants. These tasks can also be conducted by third parties with expertise in building science.

3.2.2 Underwriting Criteria – Consumer and Lender Protections

Consumer protection must be a cornerstone of any financing program, especially in the residential sector. A LIC assessment for consumer disclosure can provide property owners with information on retrofit measures, contractor engagement tips, and explain opportunities and potential risks.

Consumer protection policy topic areas include:

- Disclosure & documentation
- Post-funding homeowner support

⁶ Save on Energy. 2019.

- Data security / privacy
- Ability to pay underwriting
- Contractor requirements
- Eligible Products
- Marketing and communications
- Closing and funding
- Maximum financing amount
- Reporting

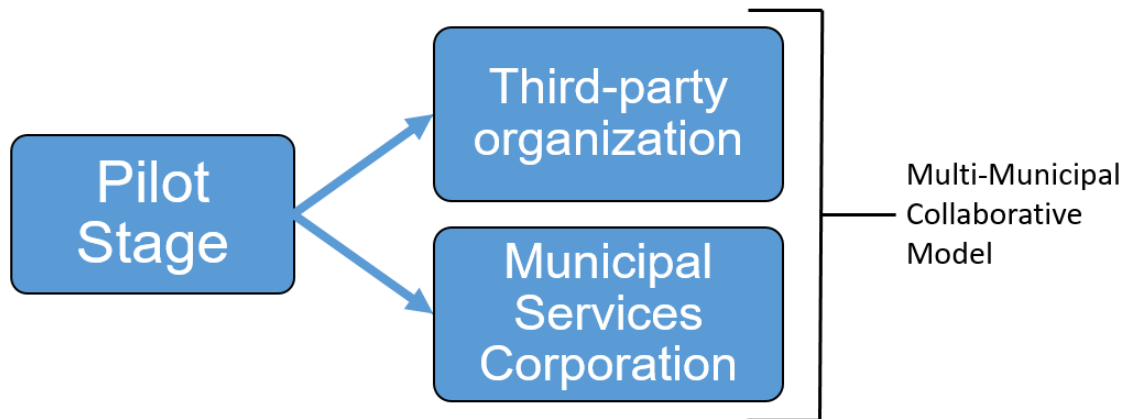
Lender protection requirements are to be incorporated and verified in the application and administrative process:

- As mentioned in **Section 2.3** of this report, the property owners must demonstrate:
 - their financial ability to pay the LIC assessment based on particular underwriting factors, their consent, tax accounts with the City are in good standing, include debt-service ratio and combined loan to value ratio, income and debt obligations, and credit scores.

4.0 Program Pathways and Business Case

4.1 Program Pathways

While the initial pilot may be a self-administered or joint municipal-third party model, transitioning to a collaborative multi-municipal model can achieve greater scale and open access to a larger market in the long-term. This can be achieved by either contracting with a third party organization or by establishing an arms-length Municipal Services Corporation (MSC).



4.1.1 Third Party Entity

A program structure that includes a Third Party Entity that secures financing for the program requires further exploration to determine how to contract the services in a multi-municipal collaboration. A performance contract is a possible approach and puts the onus on the Third Party Entity to not only secure the financing, but also to sign up applicants.

On December 2, 2019, the Association of Municipalities of Ontario (AMO), the Independent Electricity System Operator (IESO), the Clean Air Partnership (CAP) and the City of Toronto announced their partnership to act as a Third Party to deliver a Province-wide LIC-financed energy retrofit program. The City will stay apprised of this Third Party to determine the opportunity to 'opt in' to the program.

Many of the administrative functions may also be delegated to a contracted Program Administrator by issuing an RFP. The RFP can also take the form of a performance contract.

- The Third Party will manage key aspects of program administration including prequalification, reviewing and approving applications, verifying home energy audits, marketing and outreach, customer service, verifying project completion, and issuing payments to the property owner.

- In this model, the City efforts can be scoped to processing tax payments and recording the priority lien on properties.

4.1.2 Municipal Services Corporation (MSC) Model

An arms-length MSC can raise program capital through bond issuance and leverage private sector capital investment.

Under the provisions of Regulation 599/06 of the *Municipal Act, 2001*, a municipality may exercise its right to establish a Municipal Services Corporation (MSC), 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, 2001* allows municipal services corporations to be established to provide a “system, service or thing that the municipality itself could provide”. Regulation 599/06 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*”.

This is a promising governance model for a multi-municipal LIC program in the City of Vaughan, given its potential to scale up and transfer the program to other municipalities in York Region and beyond. While a municipality does not require a Community Improvement Plan (CIP) to create a MSC, it is increasingly common for Community Improvement Plans to identify energy efficiency as a desired improvement.

4.2 Achieving Scale and Securing Capital

The following options can be considered to secure capital to achieve the financial scale.

- **Municipal bond issuance** - In a tiered-municipal context, only upper-tier municipalities can issue debt, and so this approach requires collaboration between the upper-tier municipality (York Region) and its lower-tier municipalities. 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, in the case of Vaughan’s LIC program, York Region would have to incur the costs associated with debt issuance on behalf of the City, 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 York Region in issuing a bond for the City's LIC program. If the City were to establish a MSC with an initial capital base sourced from municipal reserves or senior government grant/loan capital (e.g., FCM GMF, TAF), the arms-length organization could leverage that capital base to issue bonds to raise capital for LIC loans.
- **Direct private sector capital investment** – In both the Third Party entity and MSC models, the LIC program could be capitalized through direct private sector lending.

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