Newmarket Energy Efficiency Retrofit Business Plan

March 2024

Submitted to:

Newmarket

Prepared by:

Enerva

Acknowledgements

The Steering Committee would like to acknowledge the leadership of the Town of Newmarket for initiating the development of the Newmarket Energy Efficiency Retrofit Business Plan to achieve the energy efficiency and greenhouse gas reduction targets identified in the Town's 2016 Community Energy Plan. The members of the Steering Committee are:

- Ian McDougall, CAO
- Peter Noehammer, Commissioner Development & Infrastructure
- Jason Unger, Director Planning & Building Services
- Mike Mayes, Director Financial Services/ Treasurer
- Karen Reynar, Director Legal Services
- Rachel Prudhomme, Director, Engineering Services

The Newmarket Energy Efficiency Retrofit Business Plan was developed with the oversight of a Project Core Team consisting of members from Town staff and the consulting partnerships under the leadership of Enerva Energy Solutions Inc.

- Craig Schritt, Manager, Climate, Environment & Sustainability, Town of Newmarket
- Brett Morrow, Grant Coordinator, Town of Newmarket
- Meghan White, Senior Planner, Town of Newmarket

The Newmarket Council actively participated in the project, and the project team presented progress and sought guidance during three council meetings held on:

- May 16, 2022
- May 8, 2023
- September 11, 2023

Purpose & Goal

The purpose of the Newmarket Energy Efficiency Retrofit Business Plan (NEER-BP) is to provide an implementation plan to deliver the greenhouse gas (GHG) emission reduction program for Newmarket residents as outlined in the NEER business case as approved by Newmarket Council in June 2020.

Ultimately, the goal of the NEER program is to contribute to reaching the GHG reduction targets in the Community Energy Plan, which was approved by Council in June 2016.

Introduction

In September 2021, the Town of Newmarket (Newmarket) issued a request for proposal (RFP-2021-026) for a Residential Energy Efficiency Retrofit Implementation Partner. The ensuing contract was awarded to Enerva Energy Solutions Inc in April 2022. The project scope was defined in three phases as follows:

Phase 1: Develop Investment Grade Business Plan
Phase 2: Finalize an Implementation Amendment
Phase 3: Implement NEER-BP

Phase 1: Develop an Investment Grade Business Plan for the Newmarket Energy Efficiency Retrofit (NEER-BP) deliverable must address the following areas:

- Market potential
- Business structure
- Governance and ownership
- Operating Plan
- Extended operating outlook
- Risks and liabilities

Phase 1 also included the development and implementation of a stakeholder engagement process to seek input to inform the NEER-BP which was provided during the preparation of the NEER-BP.

Phase 2 Finalize Implementation Amendment included the following:

> Following approval of the NEER-BP by Council, the Town and the Proponent (the "Parties") will conduct a good-faith negotiation to agree to an "Implementation Amendment" to the Contract. The Implementation Amendment will establish the final terms under which the selected Proponent will be the Town's Implementation Partner (Implementation Partner).

Phase 3 Implement NEER-BP upon Implementation Amendment included the following:

> The Implementation Partner will fully implement the approved NEER-BP as the sole Implementation Partner with the Town, subject to the Implementation Partner fulfilling the Performance Guarantees.

The scope of this deliverable is to provide the NEER-BP for Council approval. Subject to Council approval of the NEER-BP, phase 2 and 3 will be undertaken.

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1. Background

In June 2016, Newmarket staff supported by a Community Task Force, submitted the Town's Community Energy Plan (CEP) to Council. Council accepted the CEP as the strategic basis for the Town's energy future. The CEP was rebased to reflect a 2017 energy Baseline. The rebasing did not change any of the CEP strategic recommendations. The CEP included a strategy to substantially improve the energy efficiency of most existing homes.

As a proactive measure to improve the community's energy and GHG emissions portfolio, Council adopted the Community Energy Plan (CEP) in 2016, which was one of the first in Ontario. The CEP sets clear targets for GHG emission reductions and specific actions for achieving those results.

Further, the CEP identifies ways to support our local economy by increasing our community's competitiveness, creating jobs in the energy sector, improving energy efficiency, and improving energy security. The CEP looks at the types of energy we use as a community, how much energy is used by our homes and buildings, our travel, and how population, employment and land use impact our energy needs. The Vision of Newmarket's CEP is:

> *To create a sustainable community whose energy future is efficient, secure, reliable, and environmentally progressive. Our approach to managing energy will demonstrate leadership and be well beyond the ordinary.*

A wide range of future energy price risks and carbon regulation means energy costs in Newmarket will continue to grow unless robust goals and policies are implemented. The CEP provides a strategic direction that will move the community towards a cost-effective, environmentally responsible, and sustainable energy system, while ensuring a reliable local energy supply. The CEP is a catalyst for new economic development, behavior change, and sustainable growth in Newmarket.

The Community Energy Plan has transformative, ambitious, aspirational targets to reduce energy usage throughout the community. Specifically, the goals are to:

- **Reduce per capita primary energy use by 50% from 2017 baseline by 2041**
- **Reduce per capita greenhouse gas emissions by 50% from 2017 baseline by 2041**
- **Increase positive economic development and attractive returns**

By reducing primary energy use per capita by 50% by 2041, Newmarket will be near current global best practice. To meet those goals, the CEP calls for major efficiency gains in all sectors along with significant restructuring of parts of the Town's energy supply and distribution structure. Among these measures, a large number of deep energy efficiency retrofits to the existing residential and non-residential sector will have to be completed. The CEP stated that 80% of residential buildings will need to participate in a retrofit program by 2041 to meet the residential component of the targets

In April 2018, Newmarket staff, supported by a Stakeholder Advisory Group, began a study to validate the viability of the residential retrofit strategy outlined in the CEP. This study contemplated establishing an Entity (also referred to as NEWCO) to deliver effective and municipal scale residential energy efficiency retrofitting solutions across the community. The study (also referred to as the "Business Case") was completed in September 2019 and the findings were

presented to Council. Council provided direction to convert the study into a detailed Business Plan that would validate the assumptions made, clarify risks/liability to the Town from such an Entity, and direct the Town on how to best position the Entity.

In the next step of this process, the Town of Newmarket sought proposals from qualified bidders committed to partner with the Town to implement the Business Case and provide Performance Guarantees. This step will be completed in three stages.

The first stage will be to develop an investment-grade Business Plan for the Residential Newmarket Energy Efficiency Retrofit Entity (NEER-BP) in accordance with the direction and policies of:

- The Community Energy Plan
- The Newmarket Energy Efficiency Retrofit (NEER) Initiative
- The Newmarket Energy Efficiency Retrofit NEER) Business Case Final Report
- 2018-2022 Council Strategic Priorities
- 2022 – 2026 Council Strategic Priorities

In the second stage and following completion and approval of the NEER-BP and successful Implementation Amendment, the successful bidder will establish NEWCO and deliver residential retrofits for at least 20 years.

In the third stage and in accordance with the Business Case, NEWCO will be expected to extend the energy efficiency retrofit offering to non-residential buildings.

2. Project Methodology

The NEER-BP began with a kick-off meeting with the project management team from Newmarket. Soon after, a governance structure was developed as follows:

- Established a core team (Core Team) consisting of the Newmarket project management team and a team from Enerva to undertake the activities to complete the NEER-BP;
- Established a steering committee that included a multi-disciplinary team from various departments within Newmarket to provide strategic project guidance;
- Scheduled milestone presentations to Council.

The project approach was governed by the services described in the request for proposals and implemented as follows:

- Review and understand reports and work products previously completed and undertake the data collection process
- Establish a workshop approach with the Core Team
- Prepare and implement a stakeholder input process for homeowners, local contractors, finance experts, and trade associations
- Assess and test the assumptions from the Business Case
- Complete a legal analysis of the options available to Newmarket for the legal structure to implement the NEER-BP
- Propose interim findings, key decisions, and options to the Steering Committee and Council
- Integrate the feedback from the Steering Committee and Council presentations
- Prepare and present the status and new key principles to underpin the NEER-BP for Steering Committee feedback
- Present the status and new key principles to Council
- Complete the NEER-BP incorporating feedback

3. Market Potential

The market potential for NEER-BP was informed by the direction and policies highlighted in the background section above and more specifically the Community Energy Plan (CEP) and the Newmarket Energy Efficiency Retrofit Business Case. The market potential was also informed by data and detailed analysis from the following sources:

- Residential building stock data from MPAC
- Residential energy consumption from Enbridge Gas and Statistics Canada
- Stakeholder engagement process including surveys of homeowners and contractors
- Literature reviews from similar programs in Ontario and Canada
- Studies and reports related to residential renovations in Ontario and Canada

The outcome of the analysis undertaken provides the following key findings:

I. Newmarket residents are interested and willing to invest in energy efficiency retrofits of their homes.
II. The energy savings and emission reductions potential will significantly contribute towards the goals and targets in the Community Energy Plan and other policies.
III. Newmarket's residential target market can be divided into five segments based on the physical characteristics of the homes.
IV. The GHG emissions primarily result from home heating and water heating, while a small portion is attributable to cooking.
V. The most significant GHG reduction is achieved through the conversion of natural gas fueled space heating to electrically driven air source heat pumps .
VI. Heat pump hot water heaters are becoming more readily available and can be added to the program.
VII. The NEER-BP plan, if implemented as designed, can reach Newmarket's 50% per capita GHG reduction target. The technologies are commercially available, their costs are reducing which leads to the economic feasibility of retrofits in most applications and they are improving in market acceptance.

The NEER-BP assessed and characterized the market potential for residential energy retrofits and the financing of such projects. As such, NEER-BP considered the technical considerations, financing options, and consumer behaviour related to home renovations and financing considerations.

From a technical perspective, residential energy retrofits entail the upgrade of three systems within a home:

- Mechanical systems including heating, ventilation, and air conditioning (HVAC)
- Building envelope systems that are designed to separate the exterior environment from the home's interior and include wall and roof assemblies, fenestrations (windows and doors), and weatherization including sealing, caulking, and weather stripping.
- Electrical systems specifically where alterations are required to accommodate new electrical loads such as heat pumps and EV chargers.

From a financing perspective, the following the financing options available to homeowners were considered:

- Homeowners self-funding projects through savings or financing through existing financing methods.
- Third-party financing options bundled with the home energy retrofit without the Local Improvement Charge (LIC) component.
- LIC-based financing.

LIC is a unique financing mechanism granted via provincial regulation available only to municipalities in Ontario. LIC details are provided in section 3.4.1.

From a consumer behaviour perspective, the following considerations were examined:

- Homeowners' interest and capabilities to undertake energy retrofits.
- Homeowners' intent and capacity to borrow.
- Homeowners' considerations and criteria to undertake energy retrofits.

COVID-19 Impacts

Since the development of the business case, COVID-19 has had a significant impact on various macroeconomic parameters that impact home energy retrofits. Exhibit 1 provides a summary of the parameters and impact to home energy retrofits.

Exhibit 1 COVID-19 economic parameters and impacts

Economic Parameter	Description of the Impact
Interest Rates	To counter inflation, governments or central banks globally increased interest rates to reduce consumer demand. Interest rate increases are a blunt instrument and increased financing costs for most consumer loans such as mortgages[1], lines of credit, etc. Interest rate increases and the resulting debt servicing has caused homeowners to reconsider budgets and expenditure allocations. For NEER-BP, the ability to provide competitive and even concessionary interests will be an important feature. The probability of interest rate increases appear to have subsided with the two camps: "higher for longer" or "economic soft landing" through rate cuts.

[1] The impact of higher interest rates was immediately felt by homeowners with variable rate mortgages or fixed rate renewals.

Economic Parameter	Description of the Impact
Inflation	During COVID-19 governments globally implemented widespread lockdowns and to counter the impact to incomes, governments enacted aggressive fiscal stimulus packages. Simultaneously, supply chains were disrupted because of the lockdowns. This formed the circumstance of increased household incomes creating market demand and supply chain disruption resulting in supply constraints. This resulted in inflation unseen in 40 years during the period of 2020 to 2023. Specifically for the home renovation industry, households increased expenditures related to home improvements given the reduced options for disposable income such as travel. This exacerbated inflation for building materials, home equipment, and skilled labour. Another impact of the higher than historical trends of home renovations was that some future demand or projects were pulled forward. This is difficult to quantify but sales trends at home improvement stores show softening sales, reducing transaction volume, and lower average transactions. For NEER-BP, inflation has increased the costs of the capital costs for the energy retrofits yet inflation in electricity and natural gas did not increase at the same inflation pace. This has resulted in increased project costs and the associated energy savings in dollar value has not increased at the same pace. Inflation has subsided and the NEER-BP is assuming future inflation to be near central bank projections and more aligned with historical trends.
Employment	Employment has remained strong through COVID-19 and remains strong. For NEER-BP, this provides confidence that the economic outlook remains positive as employment is the strongest indicator of economic growth coupled with household formations, population growth, and wage growth.

3.1. Newmarket Housing Stock

Based on the business case, The residential sector represents about 38% of the total energy use in Newmarket. In 2017, the residential sector's energy metrics were as follows:

- 4.3 million gigajoules (GJ) of energy
- $74 million in annual expenditures
- 126,000 metric tonnes of greenhouse gas (GHG) emissions

For the purposes of the NEER-BP, the most important characteristics of the Newmarket housing stock are the following:

- Architectural categorization

- Home value distribution
- Age distribution and the associated building code
- Home size distribution

Exhibit 2 provides a breakdown of Newmarket's housing stock categorization based on 2022 Municipal Property Assessment Corporation (MPAC) data:

Exhibit 2 Newmarket housing stock categorization by architectural category

Category	Housing Units	Category Percentage	GHG Emissions[2]
Detached	19,037	73.4%	82%
Semi-detached	2,946	11.4%	8%
Row/Townhouses	3,932	15.2%	7%
Total	**25,915**	**100%**	**97%**

The detached category is the primary focus within the NEER-BP as this segment has the most available data, is the largest market, has higher energy use and GHG emissions, and is representative of the semi-detached and townhouse markets. For example, the NRCan data for prior energy audits is limited to detached homes. The detached homes typically consume more energy with greater emissions. The analysis for the business plan is based on detached homes but the implementation will include all home categories.

Exhibit 3 provides the distribution of modelled energy intensity for homes in Newmarket. The exhibit demonstrates a gradual reduction in energy intensity as progressive building codes (depicted by the dashed vertical red lines) have improved building standards. However, the exhibit also demonstrates the wide range of energy intensities for homes built within the same building code normalized for home size. This clearly demonstrates that homes in Newmarket have a large opportunity to reduce energy consumption. For example, if all homes built under the same building code could reduce their energy intensity to the level of the lowest decile of homes, there would be significant energy and GHG savings. There are many reasons for the dispersion in energy intensity such as occupancy/family size, homeowner behaviour, features such as saunas, hot tubs, pools, mechanical system controls, etc. The key takeaways from Exhibit 3 are:

- Improvements in the building code correlate to declining energy intensity
- Energy intensity is widely dispersed normalizing for construction periods
- Significant potential energy savings exist by improving energy performance of homes

[2] Retrieved from the Business Case, using 2017 Baseline and remaining 3% GHG Emissions were from multiunit low-rise and mid-rise buildings

Exhibit 3 NRCan Modelled Energy Intensity by Year Built

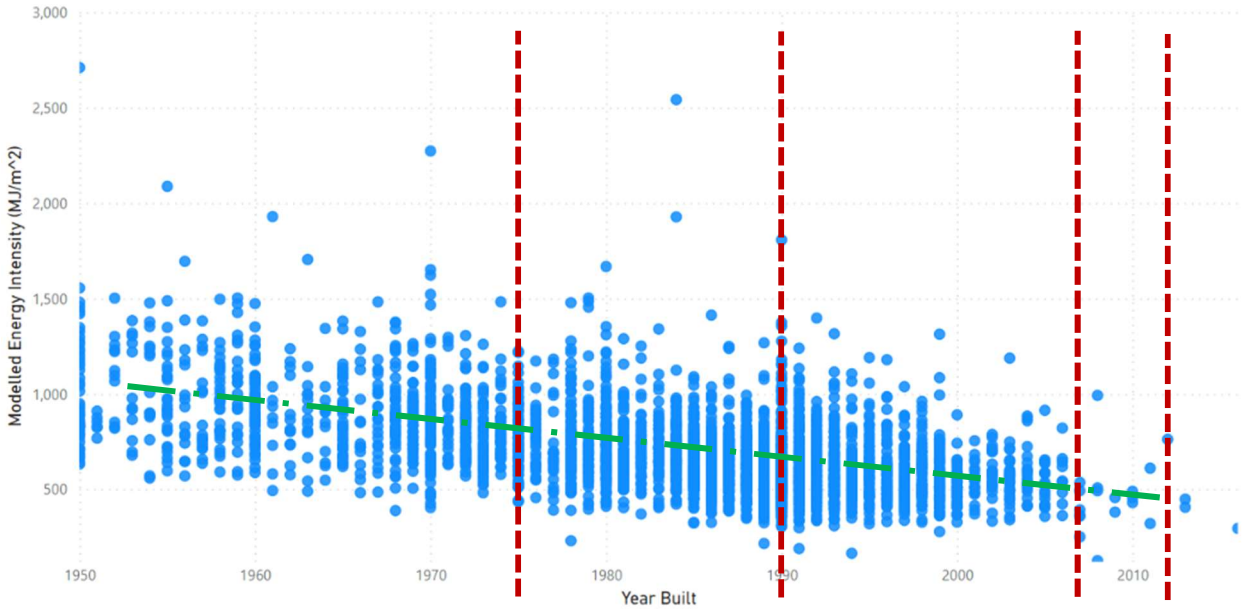


Exhibit 4 provides the distribution of assessed value of homes in Newmarket based on year built. This graph demonstrates the range of assessed by age. The assessed value distribution does not consider the following parameters:

- Location
- Size of home or property
- Home quality

The parameters that impact energy retrofits are home size and home quality. Larger homes will require larger mechanical systems and home quality. The analysis within the NEEP-BP matches the mechanical system sizing and final energy retrofit pricing considers the range of home quality.

Some insights of the assessed value distribution include:

- Dispersion of the minimum assessed value is within a tighter range indicating that lower value homes are within a tight band reflecting land value explains a larger portion of the home value.
- Dispersion of the average assessed value is within a tighter range indicating the greater influence of lower value homes on the average.
- Dispersion of the maximum assessed value has a wide range that may reflect land value or size, home sizes, build quality, material selection, and location.
- Dispersion patterns are not related to building codes

The implication of the assessed value analysis demonstrates that home mechanical systems retrofits may have similar cost distributions especially at the high home values. That is, higher value homes will likely have more premium mechanical systems in terms of size, zoning[3], and controls. In addition, higher value

[3] Zoning is the ability to have two or more independently controlled climate zones within the home.

homes will have more expensive finishes, trims, and materials that may need to be repaired or replaced as part of a mechanical system upgrade.

The primary purpose of the assessed value analysis was to determine if a fixed price ($/sq ft) structure could be implemented as proposed in the business case. Along with feedback from contractors and this data analysis it was determined that a fixed price per project can be provided offering cost certainty for homeowners, but a pricing plan indexed to home size was not feasible.

Exhibit 4 Assessed Value Distribution by Year Built

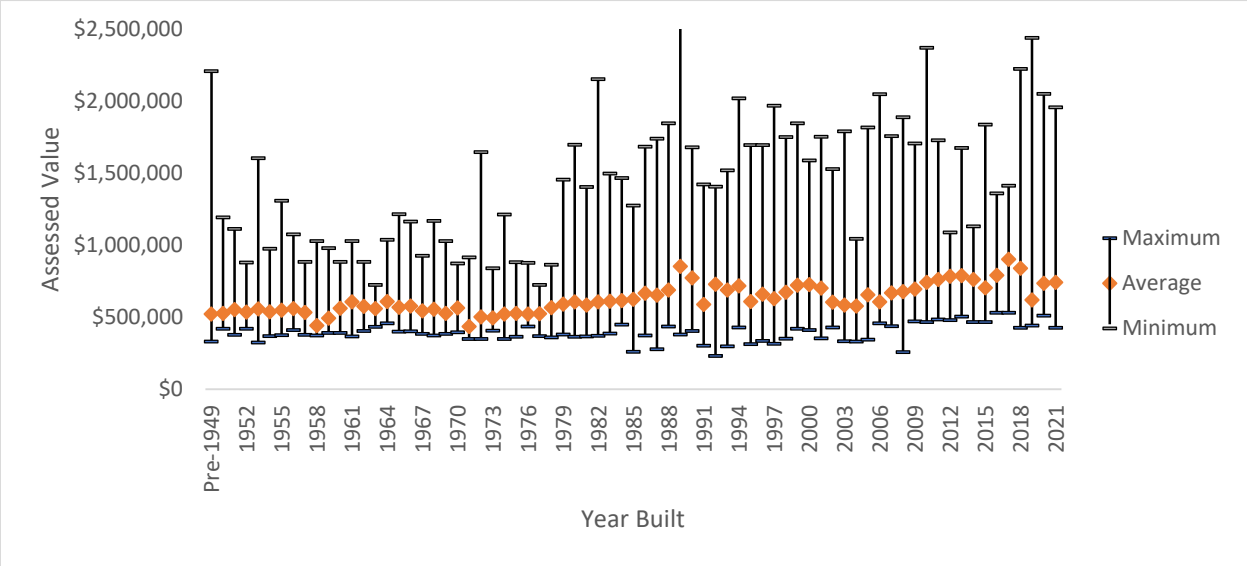
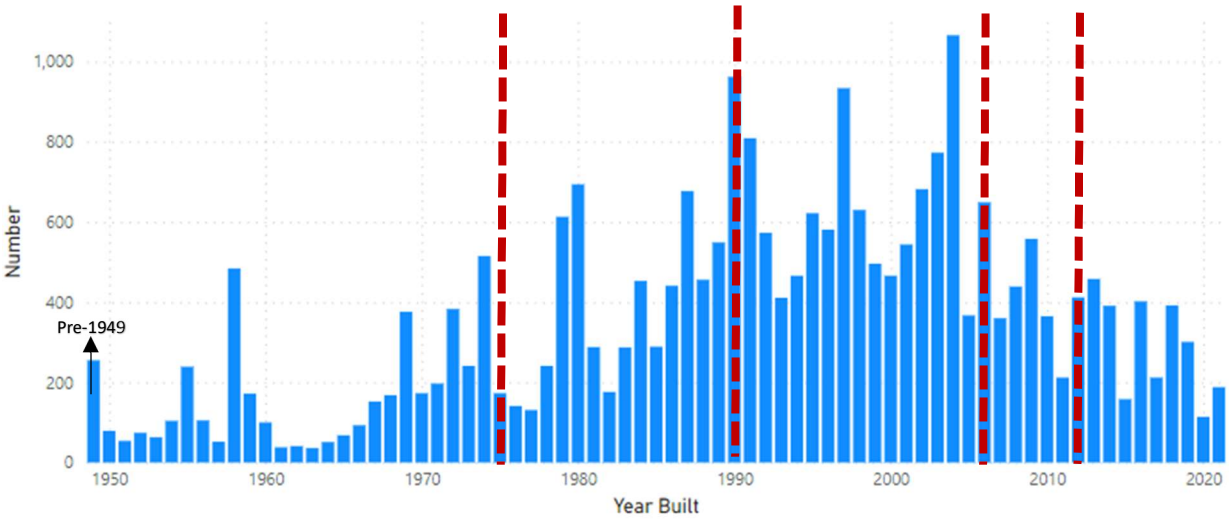


Exhibit 5[4] provides a distribution of Newmarket's housing stock by age. Housing age reflects the applicable building code for construction. Prior to 1975, Ontario used the national building code. Vertical red dash lines represent significant building code updates. The Ontario Building Code was substantially updated in 2012.

Exhibit 5 Distribution of Housing Stock by Year Built



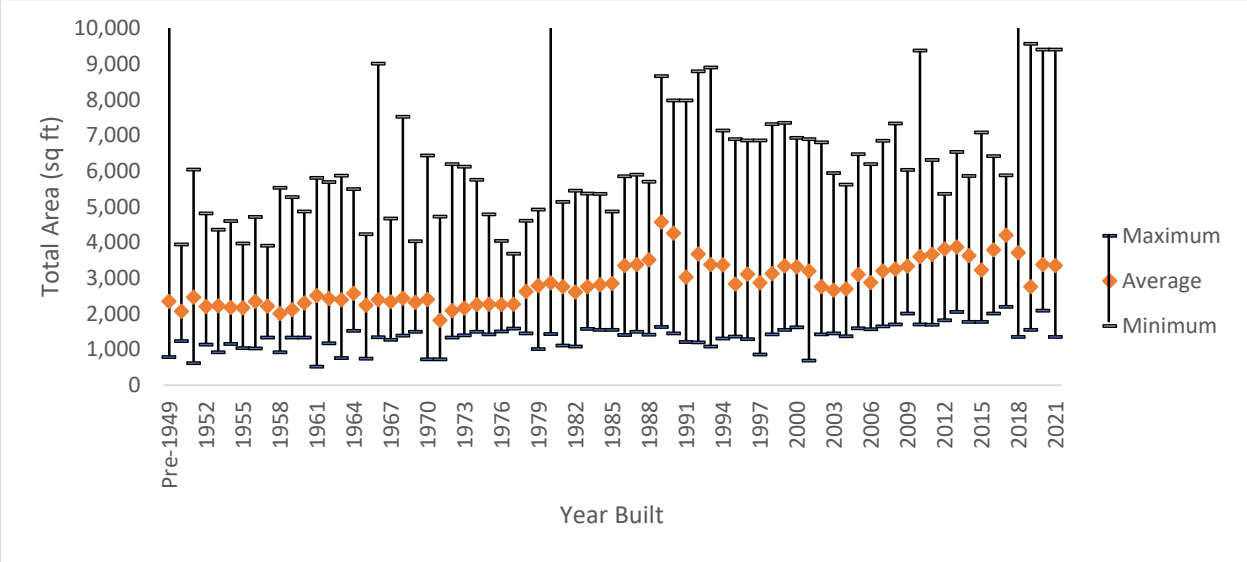
For the purposes of the NEER-BP, Newmarket's housing stock can be segmented as follows:

- 17% of homes were built prior to 1975 under the relevant national building codes
- 69% of homes were built between 1975 – 2012
- 12% were built after 2012 under recent building codes

[4] Data sourced from Municipal Property Assessment Corporation (MPAC) for 2022

Exhibit 6 provides the finished area or home size distribution by year built. Finished area is directly related to conditioned space and the most important parameter to size mechanical systems in a home. The primary purpose for the home size analysis was to forecast sizing of heating and cooling systems for the NEEP-BP. The dispersion of the home size provides insight into the typical sizing of heat pump systems.

Exhibit 6 Finished Area Distribution by Year Built



3.2. Target Markets

The NEER target markets were established based primarily on the physical characteristics of the residential building stock in Newmarket. The physical characteristics provide insights into the energy performance, the improvement opportunities, and the go-to-market approaches.

The available data sets for target marketing included the following:

- Anonymized MPAC data set for all single-family homes in Newmarket
- Anonymized NRCan data
- Anonymized Enbridge data set at the 6-digit postal code level
- StatsCan energy data sets

Other important data considerations for target marketing include the following:

- Socio-economic considerations such as family size, income, net worth
- Renovation intentions, capability, capacity, and renovation history
- Macro-economic considerations such as consumer sentiment, interest rates, inflation, and job security or employment
- Shifting landscape of other programs targeting energy efficiency

The NEER-BP target market assessment is based on all home types. NEER-BP did not specifically focus on income levels or design specific target markets for low-income households. The main reason is that debt products with long-term repayment terms are not well-suited for lower income households that further impact affordability issues given stretched budgets. NEER-BP will provide awareness and information for available low-income programs. Additional delivery details are presented in Appendix B and details of other eligible programs are listed in Appendix D.

We have focused the target market identification based on the physical characteristics of homes as the MPAC data was the most complete data set at an anonymized address level. Data sets for the other considerations allowed for inferences and judgment but could not be overlayed onto the MPAC data.

The target market segmentation was augmented with primary research comprising of a telephonic interview and an online voluntary survey.

Exhibit 7 provides the NEER-BP target market summaries with various parameters. Detailed market segmentation methodology is included in Appendix C: Market Segmentation Methodology.

Exhibit 7: Summary of target market characteristics

Name	Target Market #1	Target Market #2	Target Market #3	Target Market #4	Target Market #5
Architecture	Detached	Detached	Detached	Detached	Semi, Row & Townhouse
Storeys	1	Mostly 2	Mostly 2	Mostly 2	Mostly 2
Basement	Yes, mostly unfinished	Yes, mostly unfinished	Yes, mostly unfinished	Partially finished	Typically, no basement
Bedrooms	3	3-4	4-5	3-4	3
Central Cooling	~50%	~71%	~61%	~76%	~57%
Construction Period	Prior 1975	1997-2006	Built after 1990	1975 – 1990	Around 2000 & some ~1960
Assessed Value	~$550k	~$750k	Top 20% value (>$827k)	~$700k	~$500k
Size (Sq Ft)	~2,000 sq ft	~3,500 sq ft	~5,000 sq ft	2,000 – 6,000 sq ft	~2,000 sq ft
MPAC Quality	6	6.5	7 - 7.5	6 - 6.5	6.5
Market %	12%	14%	15%	31%	27%
Market Size	3,200	3,750	3,800	8,000	6,900
Location[5]	Ward 6 & parts of 2, 3, 4	Ward 6 & 7 & parts of all Wards	Ward 1 & 7	All wards, more in 2, 3, 4, & 5	All wards, more in 2, 3, 4, & 5
GHG Reduction Potential[6]	59%	57%	43%	51%	63%
GHG Reduction Potential (Ton of CO_2e)[7]	12,378	11,055	13,752	32,029	20,714

[5] The various data sets had varying levels of location granularity. Ward was selected as the geographical boundary as a compromise for the geolocation data.
[6] The numbers are reflected with standard heat pump with electric back up and weatherization only.
[7] With 100% market penetration and standard heat pump with electric back up conversion only.

3.3. Homeowner Survey Results

The NEER-BP was directly informed through two homeowner surveys with total input from 240 Newmarket residents. The survey modalities and details are provided below:

- Telephonic survey
  - Random selection
  - Targeted and received 100 respondents
  - Conducted December 19-28, 2022
- Digital online survey
  - Respondent self-selection
  - 140 voluntary respondents
  - January – March 17, 2023

The key takeaways from the combined surveys

- 41% of total respondents are considering home renovations
  - 97% of these respondents with home renovation intents would consider energy improvements during their renovations. Hence, 39.8% of total respondents would consider energy efficiency retrofit.
- 83% of total respondents would value the Town of Newmarket pre-qualifying contractors for quality workmanship, safety, and competitiveness.
- 65% of total respondents would appreciate some advisory service. Among these respondents, 20% of them are willing to pay for it and 62% of them would pay if the cost is reasonable
- Among all respondents, 58% prefer not to borrow but self-finance, 23% prefer existing lender (bank, mortgage company, or line of credit) and 20% prefer a municipal property assessment that stays with home
- Exhibit 8 shows the most attractive finance characteristics to the participants.

Exhibit 8 Homeowner Survey Summary

Newmarket Energy Efficiency Retrofit (NEER) Resident Survey Results (1/2)

Overview

The surveys were conducted among residents of the Town of Newmarket to assess opportunities for homeowners to inform the NEER business plan. The main objective of the survey is to collect detailed primary research on renovation intention, financial considerations, and product design input.

Stage 1: Phone Survey
Dec. 19 to Dec. 28, 2022
100 valid completes

\+

Stage 2: Online Survey
Jan. 16 to Mar. 17, 2023
141 valid completes

=

241 total respondents

Demographics

74% Single-detached

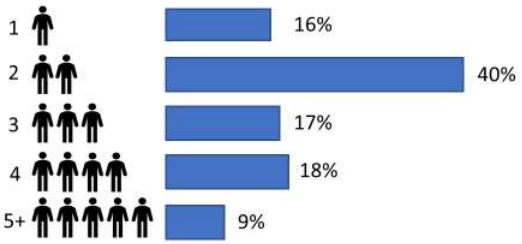
14% Semi-Detached

7% Multiplex

3% Condominium

2% Apartment (Rental Only)

Number of people living in the house



56% have lived in their homes <19 years
33% have lived in their homes 20- 39 years
11% have lived in their homes >40 years

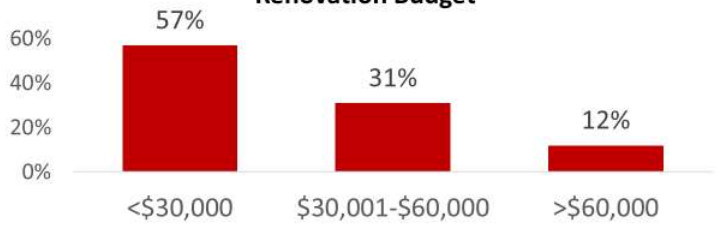
Renovation Intention

Q: Are you considering a home renovation?

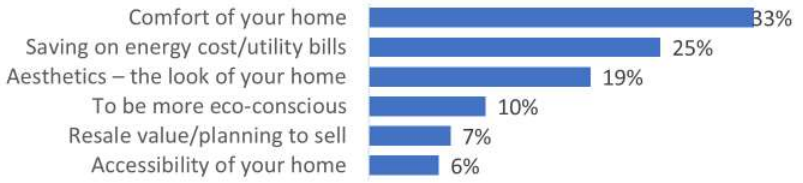
For those who said "yes"
97% would consider energy improvements
27% are in the process of home renovations
Top 3 renovation intention:

- Bathroom upgrades
- Kitchen upgrades
- Minor (painting & aesthetics)

Renovation Budget



Q: Why are you considering the renovation?



Newmarket Energy Efficiency Retrofit (NEER) Resident Survey Results (2/2)

Concierge Service

Q: Would you value the Town of Newmarket pre-qualifying contractors for quality workmanship, safety, and competitiveness?

83% YES **17% NO**

Top 3 Contractor Characteristics

- Quality of workmanship
- Good reputation
- Competitive price

Q: Would you like to receive support services from an advisor for the best renovation approach?

65% would appreciate some advisory type service

Among these respondents

- **20%** are willing to pay for advisory services
- **62%** depend on the cost
- **18%** prefer free advisory services

35% do not need advisory type service

Financing

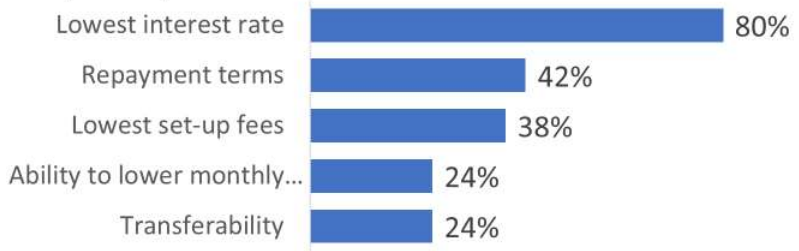
Q: What is your financing preference?

58% prefer not to borrow
23% prefer existing lender (bank, mortgage company, or line of credit)
20% prefer a municipal property assessment that stays with home

Q: Ranking features of municipal loan to homeowners:

1. Loan term is **flexible**, and payments designed to align with energy bill savings
2. Municipalities get **lower** borrowing costs and **lower** interest rates
3. Municipalities aggregates projects to get **volume discounts** from contractors
4. The loans are assessed against the property and hence **transfer** to the buyer
5. Municipalities can **bundle** other **services** such as energy advisory or coaching

Q: What are the most important finance characteristics to you? (Multiple choice question)



3.4. Product Offer

The NEER-BP product offering was designed incorporating the feedback from the homeowner surveys, data analysis, consumer-driven design principles, and the innovation offered by the LIC finance structure. The specific principles used to design the product offer are summarized as follows:

- Consumer driven choice for financing models
- Simplified turnkey package to replace a natural gas furnace with an electric heat pump
- Technology application for consumer awareness and operational program delivery

These product design principles are intended to create the following product features:

- "One-stop shop" as a turnkey solution for trusted advise, energy retrofit design and delivery, financing, and maximization of GHG emission reductions.
- "Easy to buy, easy to sell" as a simple product offer and simple to explain value proposition
- Streamlined and digital purchase process from awareness building via Concierge 2.0 and automated workflows for operational management.
- Concierge 2.0 will allow homeowners to begin the education process and purchase journey at their convenience and available 24 hours a day.

The proposed product offer within the NEER-BP is characterized as follows:

- Bundled finance based on a PACE/LIC finance structure or direct lending and ability to incorporate homeowner provided financing
- Turnkey retrofit focused on air-source heat pump and insulation upgrade measures with an ability to add other GHG reduction measures as options. The turnkey approach provides the homeowner with full project delivery including equipment and installation services.
- Online digital concierge service ("Concierge 2.0") for pre-sale activities
    - Digital awareness building and information for homeowners (available without a user account) including financial and technology details for energy saving measures
    - User registration with address validation for Newmarket residents will provide access to the following services:
        - Input screens to qualify homeowners
        - Input screens for additional information to size, scope, and cost projects
        - Input screens to collect energy data and other parameters to develop an energy model
        - Scheduling capabilities to talk to a representative
- Online digitized workflow automation and operational management system ("OMS") including the following steps:
    - Standardized retrofit specification approach to size and specify the project
    - Standardized quotation process to cost the project and provide a project cost estimate
    - Standardized contracting process including a site visit to execute the contract
    - Financing repayment
    - Records management and warranty management
- Integrated warranty and post-project maintenance

The bundled finance and project delivery offer is designed to provide a technology package and financing options to allow easier and faster decisions by homeowners. This integrated approach removes two significant purchase barriers, technical information and financing, reducing overall transaction costs for consumers. The turnkey option further reduces decision barriers by combining the project scoping, sizing, and specification, contractor selection, project management, and quality management into a turnkey solution. The NEER-BP aims maximize decarbonization by focusing on space conditioning by fuel switching heating from natural gas to electricity and providing more efficient cooling than traditional air conditioning systems.

The NEER-BP product offer provides a differentiated product based on the following improvements relative to the current market offerings:

1) Integrated, seamless, and flexible customer experience
2) Cost advantage
3) Maximize GHG reduction
4) Reduce information asymmetry between consumer and retrofit market (ex. products, prices, contractors, etc.)

3.4.1 Financing Options & Considerations

NEER-BP brings an innovative new solution to financing home energy retrofits enabled under Ontario Regulation 586/06 (OReg 586/06). Part III of OReg 586/06 provides for local improvements on private property by agreement. Newmarket will need to pass a by-law to authorize the use of local improvement charges to finance home energy efficiency renovations. This type of municipal financing arrangement is referred to as a local improvement charge (LIC) or property assessed clean energy (PACE) loan. The LIC is secured by the underlying property. As such, the loan amounts will be provided based on prudent loan to value ratios. The loan is tied to the property and not the individual.

Homeowners will be offered the LIC loan offer with a competitive interest rate. However, based on the homeowner survey, a large portion of the respondents stated that they have sufficient savings or would prefer to use existing finance facilities. The proposed approach will present the LIC benefits and allow homeowners to make their own choice for financing.

From a homeowner's perspective, the three main advantages of an LIC are as follows:

- Loan transferability to a new homeowner upon sale analogous to mortgage portability and transfer of water heater maintenance contracts.
- Loan transferability effectively allows the current homeowner to gain the benefits of the retrofit and transfer the remaining contract at time of sale. The cost of the retrofits stays with the homeowner that is enjoying it's benefits.
- Extended loan amortization to lower monthly payments or to match the energy cost savings

3.4.2 Energy Retrofit

The proposed energy retrofit bundles are packaged in three tiers with flexibility for customers to add options. The tiers are designed to maximize GHG reductions, increase the ease of delivery, to consider the current lifecycle of the mechanical, electrical, and building envelope systems along with customer budgets. Exhibit 9 provides the proposed energy retrofit offer structure of the energy retrofit bundles.

The primary focus of the NEER-BP is the Saver column with information and options available for Maximizers and Champions.

Exhibit 9 Energy retrofit product offer structure

Energy Retrofit Offer Structure		
Saver	**Maximizer**	**Champion**
NEER-BP Focus	**Bundle Option #1**	**Bundle Option #2**
Air source heat pump Smart thermostat Weatherization & air sealing	Air source heat pump Smart thermostat Weatherization & air sealing Attic insulation Heat pump hot water heating Advanced controls Energy simulation modeling Condition assessment Equipment maintenance Heat pump clothes dryer GHG Reduction Plan	Air source heat pump Smart thermostat Weatherization & air sealing Attic insulation Heat pump hot water heating Advanced controls Energy simulation modeling Condition assessment Equipment maintenance Heat pump clothes dryer GHG Reduction Plan Wall and foundation insulation Window, doors, skylight upgrades Photovoltaic Level 2 EV charger

3.4.3 Concierge 2.0

During the NEEP-BP development, homeowners identified information gaps and a need for unbiased and trustworthy information related to energy improvements. The areas of interest expressed by homeowners included:

- Technical and operating details for energy efficiency technologies
- Scope and specification of retrofits needed to reduce GHG emissions
- Contractor selection and contracting

These items indicated various barriers to implement energy efficiency improvements. Consequently, the NEER-BP Core Team discussed various solutions to address these barriers. The most common approach used by other similar programs include a concierge service consisting of a call centre with representatives with residential energy advisory qualifications.

As an example, Durham Region offers a Home Energy Coach offering the following services:

- Initial one hour call with the coach to discuss a virtual home audit
- Scheduling an EnerGuide home evaluation
- Project management items like reviewing the EnerGuide Upgrade report, prioritization of projects, selection advice for contractors, reviewing contractor quotes, financing considerations, assessing other incentive programs and preparing applications.

The Durham Home Energy Coach process begins by completing an application process and data collection form on the program website which triggers an email with an invitation to the user portal. After the registration process, the portal provides a scheduling button to book the energy coach consultation. The Home Energy Coach provides up to four consultations of 45 minutes each at no cost if the homeowner completes the EnerGuide Home Energy Evaluation. The Home Energy Coach is also implemented by other programs such as Kingston's and Ottawa's.

The Core Team discussed the Home Energy Coach and considered a better and more innovative approach would be to design and develop a Concierge 2.0 application. This decision was anchored in two primary concerns: cost and scalability. That is, setting aside the portal set-up costs, four one-hour sessions with an energy advisor will add significant to program delivery costs.

The Concierge 2.0 concept uses the following framework:

- Available to all Newmarket residents as a free service at any time
- Allow two-way communication with no approval or acceptance processes
- Leverage technology and innovation for easier and scalable methods to provide the services of an energy coach
- Incorporate technical, financial, and behavioural considerations to provide a renovation plan integrating energy savings measures

The main features and functionality for Concierge 2.0 include the following released in phases:

- Browser based mobile responsive platform
- Easy account set-up (username and password to start)
- Concierge 2.0 workflows will be released in phases and will follow the consumer decision making process as follows:
    - **Learn**: Access to various information necessary to evaluate and plan a renovation that integrates energy saving measures including heat pumps, water heating, building envelope, etc.
    - **Build**: Compare options of heat pumps and other measures by entering simple home characteristics such as size, age, and existing equipment.
    - **Evaluate**: Consider options of measures and renovation scope

  - **Plan**: Considerations to implement a renovation project incorporating measures including project scope and specification, budgeting, scheduling, project management, integration of other programs[8], and on-site assessment
  - **Save**: Functionality will include contracting, communications, scheduling updates, deficiencies reporting, project close-out, product manuals, warranty administration, and post-project customer service
- Each workflow will guide the customer towards the next step with a progression indicator and have save and return functionality
- Evaluate, Plan, and Save stages will have downloadable content
- Concierge 2.0 will be expanded to integrate GreenButton[9] and virtual energy audits
- Additional features with staged implementation may include:
  - 2-way engagement platform for residents to connect and discuss energy efficiency renovations and GHG reducing activities
  - Chat bot where homeowners can communicate with a contact centre via Concierge 2.0
  - Energy and GHG calculators

3.4.4 Operational Platform & Workflow Automation

The NEER-BP proposes an operational and workflow automation platform ("Platform") to deliver the LIC-based energy retrofit program. The Platform will be the hub for all operational activities after a homeowner moves through Concierge 2.0 and begins the journey to implement the retrofits. The modules of the Platform will include:

(i) Account registration and authentication
(ii) Retrofit scope and specification
(iii) Financing and settlement
(iv) Project contracting and pricing
(v) Project scheduling and dispatching
(vi) Approvals and workflow management for project installation
(vii) Quality control
(viii) Communications
(ix) Reporting dashboards
(x) Recordkeeping, owner's manuals, and warranty

The Platform will allow all operational activities to be monitored, controlled, and managed. The user experience will allow homeowners to access status of their project from the start to finish and request services. For example, a homeowner can request changes to their project scope and assess the impact on the budget in the Platform.

[8] Greener Homes, CMHC, and utilities
[9] GreenButton is an Ontario Energy Board requirement for all Ontario distribution companies to provide access to energy data to third parties once authorized by the homeowner. This allows NEWCO to integrate actual homeowner pre and post project data analysis.

4. Business Structure

The proposed business structure of NEWCO covers the various aspects of operating and delivering the NEER-BP. The business structure is designed to scale as the organization grows towards meeting its mandate. The business structure is also designed to account for the start-up requirements and reaching steady state.

4.1. Marketing & Sales Strategy

The marketing and sales strategy is designed to convert the marketing potential into market demand. The marketing approach uses the framework of the 4P's: product, price, promotion, and place.

4.1.1 Product

The product has been defined in the market potential section above. In short, the product is an integrated offer of financing and a turnkey installation of measures to reduce energy use and GHG emissions.

The product offer will be positioned slightly differently for each of the five target markets considering the construction quality, assessed value, home size, age of equipment or remaining equipment life, etc.

With the focus on replacing existing natural gas furnaces, the following considerations will be critical for homeowners:

- Existing central or room air conditioning
- Existing size of electrical service
- Heat pump sizing to meet cooling or heating load and process to determine conditioning capacity
- Heating back-up depending on heat pump sizing

According to the NRCan and MPAC data, the vast majority (>96%) of homes use central furnaces for heating. The infographics in marketing segments provide the penetration of central air-conditioning for each of the five target markets. The conversion from a central forced air heating with its associated ducting to electric heat pumps provides heating and cooling for homes. Homes without central forced air heating and ducting, can still be converted to heat pumps through ductless split systems.

In addition to the energy retrofit, the product offer also consists of Concierge 2.0 to support pre-sales activities and bundled financing. The proposed NEER-BP product offer includes the following value-added services:

- Energy simulation modeling especially to change the capacity relative to the existing heating and cooling systems
- Condition assessment reports
- Extended warranties
- Maintenance packages

The value-added services are optional and selected by the homeowner at additional cost.

4.1.2 Price

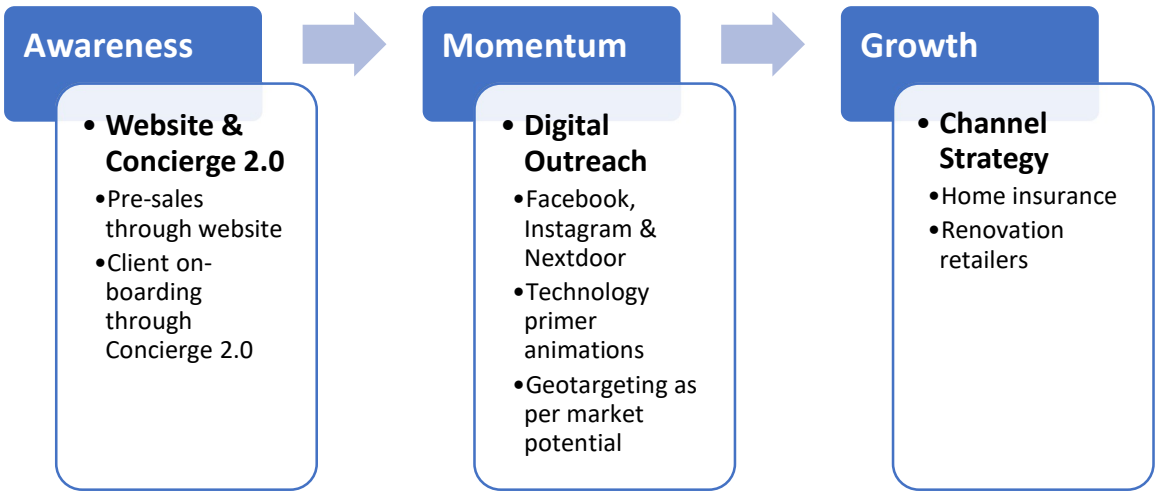
The pricing strategy will be "cost plus" for both the technical scope of the project and the interest rate for the financing. Each transaction will be costed and priced on an individual basis based on the scope and specification of the project. The goal will be to provide the best value to homeowners.

Pricing will be determined by the types of options, the make and model of equipment, and the installation details selected by the homeowner. During the order taking process, the project details such as equipment sizing, physical location, optional features, etc. will be determined. For example, heat pumps may be physically located to conform to requirements of the homeowner (to consider visual impact or noise concerns), and they may select optional features to suit their needs.

4.1.3 Promotion

The marketing promotion will focus on the following major work streams within a framework of awareness, momentum, and growth:

Exhibit 10 Market Promotion Process



The awareness building phase will be designed and implemented during the start-up phase. The website and Concierge 2.0 will be pre-sales activities to create interest and demand for the product offering. Traffic will be generated to the website through the following activities:

- Announcement and linkage to the Town's website, Newmarket Tay Power website, etc.
- Leverage signage (e.g. roller boards) at Newmarket facilities such as the Town Hall, community centres, etc.
- Announcements within Councillor communications
- Earned media through the issuance of a press release
- Municipal communication stuffers such as property tax bills and Newmarket Tay electricity bills
- Announcements, handouts, and signage at community events

Digital Outreach phase will focus on community building through Facebook and Instagram groups and communication through Nextdoor for Public Service which offers an engagement tool for local councils, government agencies, not-for-profits service providers, and community organizations. Nextdoor can also be leveraged to geotarget according to the five home types of the target market segments.

The technology primer animations will focus on heat pumps for space and water heating and the building envelope improvements. The animation will show how the technology works, upgrade considerations, and how to operate and maintain the technology.

An example of a successful promotion campaign can include a mobile tiny home that was used by the Green Ontario Fund in 2018. The tiny home was a mobile exhibit of various GHG reducing and energy savings technologies and information that can be moved within the community to various events. This type of marketing tactic provides a very practical and interactive approach to create awareness and educate the community. This link provides pictures and a video to the tiny home used by the Green Ontario Fund. (https://www.aaronpeever.com/green-ontario-fund-tiny-house). This would be most effective if cost-shared with other municipalities offering a community efficiency finance program.

4.1.4 Place

The primary distribution channel or place for the product offer will be digital. A storefront or other physical location is not required. However, as a turnkey solution for residents, customer service representatives will need transportation for site visits to collect field data for estimating, project management, and quality assurance.

4.1.5 Market Segments

The market segment infographics provide critical information for each target market. Page 1 of each infographic provides physical and energy characteristics and geographic distribution. Page 2 provides the annual energy costs for four configurations as follows:

- Natural gas heating system with electric air conditioning
- Standard heat pump with natural gas for back up heating
- Standard heat pump with electric back up heating
- Cold-climate heat pump with electric back up heating

Page 2 also shows the total lifetime energy savings potential and the market opportunity and GHG savings impacts at various market penetrations. The detailed methodology of market segments is presented in Appendix C

The methodology of market segments is presented in Appendix C.

Home Type A

Built Before 1975

01. Physical Characteristics

Type	Location	Central AC	Structure Quality
Detached, mostly single-storey, 3-bedroom, and basement	**Ward 5 and parts of 2,3 and 4**	**~50%**	**6**

Finished Area

2,275 sqft*

528 sqft — 14,637 sqft

Assessed Value

$546,334*

$363,000 — $2,210,000

* Average value for Home Type A

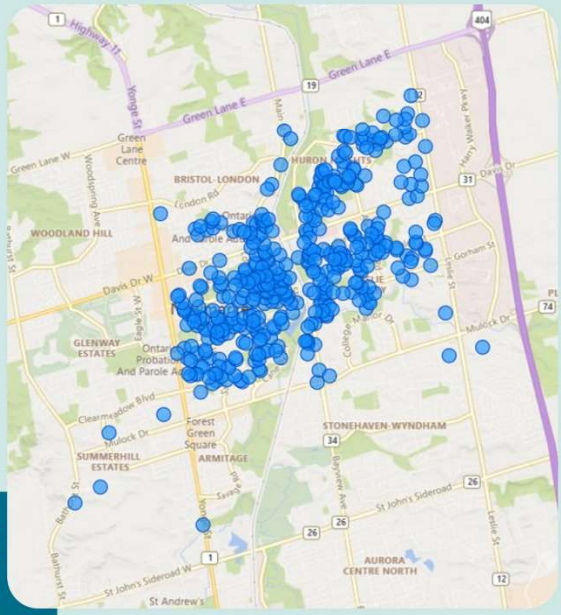
02. Energy Characteristics

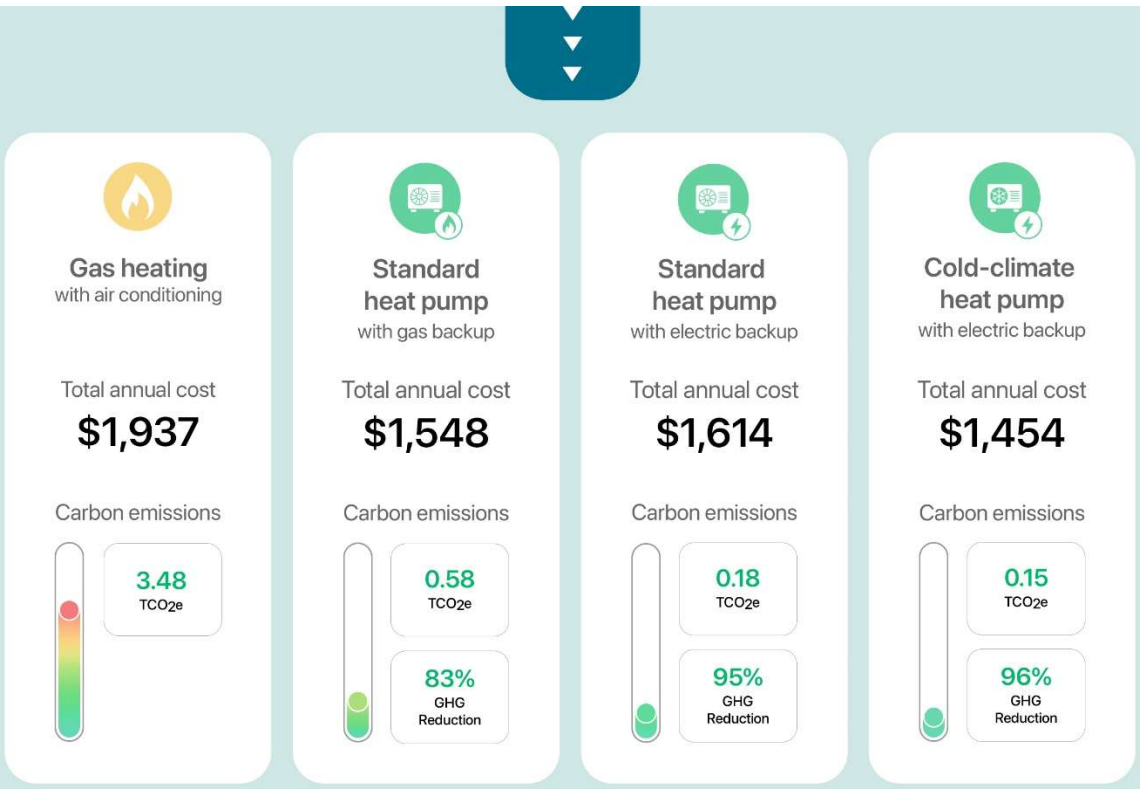
Example home **before** retrofit:

*Based on OEB Cost Calculator 2023

Annual Electricity Consumption **9,041 kWh**	Annual Electricity Cost* **$1,680**
Annual Natural Gas Consumption **2,928 m^3**	Annual Natural Gas Cost* **$1,685**
Annual Energy Cost **$3,365**	Annual GHG Emission **5.9 Tonne CO_2e**

03. Distribution

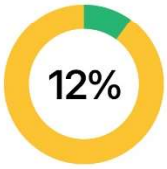




Calculation methodology and assumptions provided in the final report.

04. Opportunity

Market Potential



Market Size

~3,200 Homes

Replace furnace with air source heat pump providing heating and cooling

Additional energy and GHG reductions can be attained through insulation upgrades, air tightening, heat pump hot water heating, and building envelope upgrades.

05. GHG Savings Potential

Market Penetration	Number of Homes	Total GHG Emission Reduction (Tonne CO_2e)*
10%	320	1,056
25%	800	2,641
50%	1600	5,281
80%	2560	8,450

* Based on standard heat pump with electric backup.

Home Type B

Around 20 years old

01. Physical Characteristics

Type	Location	Central AC	Structure Quality
Detached, mostly 2-story 4-bedroom homes without finished basement	**All Wards, more in 1, 6 and 7**	**~71%**	**6.5**

Finished Area

3,454 sqft*

700 sqft — 7,376 sqft

Assessed Value

$742,594*

$472,000 — $2,049,000

* Average value for Home Type B

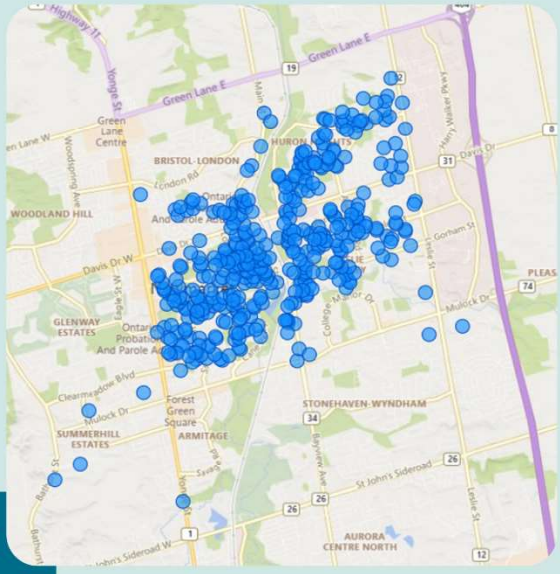
02. Energy Characteristics

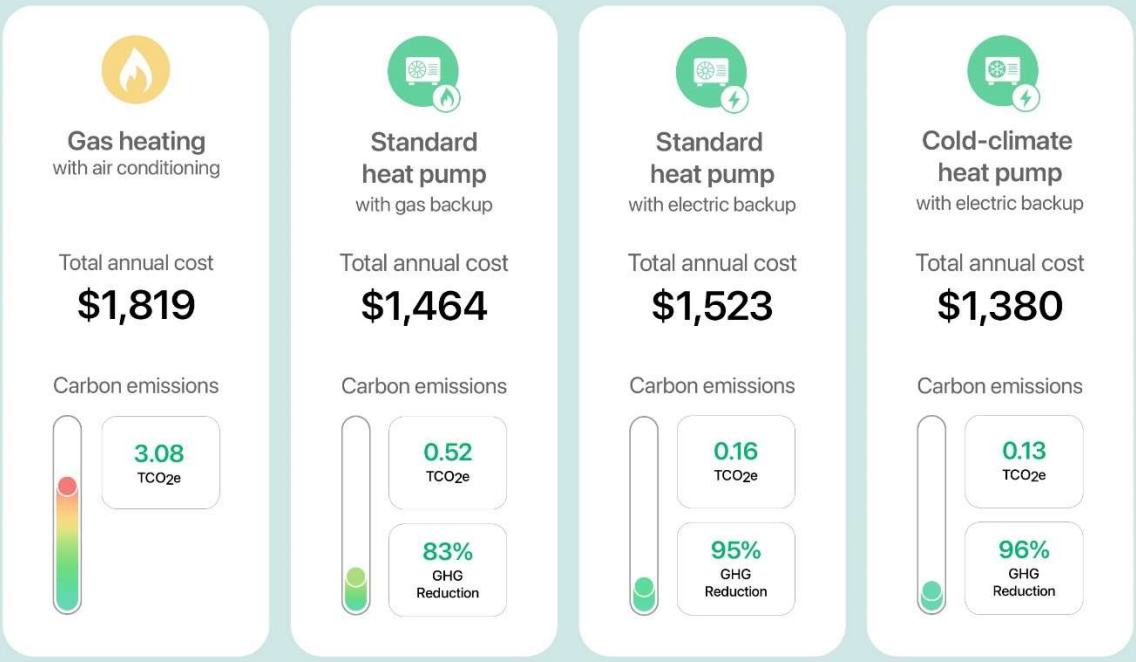
Example home **before** retrofit:

*Based on OEB Cost Calculator 2023

Annual Electricity Consumption **9,101 kWh**	Annual Electricity Cost* **$1,688**
Annual Natural Gas Consumption **2,653 m^3**	Annual Natural Gas Cost* **$1,558**
Annual Energy Cost **$3,246**	Annual GHG Emission **5.4 Tonne CO_2e**

03. Distribution

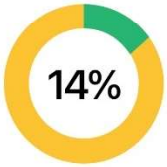




Calculation methodology and assumptions provided in the final report.

04. Opportunity

Market Potential



Market Size

~3,750 Homes

Replace furnace with air source heat pump providing heating and cooling

Additional energy and GHG reductions can be attained through insulation upgrades, air tightening, heat pump hot water heating, and building envelope upgrades.

05. GHG Savings Potential

Market Penetration	Number of Homes	Total GHG Emission Reduction (Tonne CO_2e)*
10%	375	1,094
25%	938	2,734
50%	1875	5,468
80%	3000	8,749

* Based on standard heat pump with electric backup.

Home Type C

Top 20% assessed value

01. Physical Characteristics

Type	Location	Central AC	Structure Quality
Detached, mostly 2-story 4-bedroom homes without finished basement	**Ward 1 , 7 and some in 5**	**~61%**	**7 or 7.5**

Finished Area

4,869 sqft*

700 sqft — 14,637 sqft

Assessed Value

$991,890*

$827,000 — $3,894,000

* Average value for Home Type C

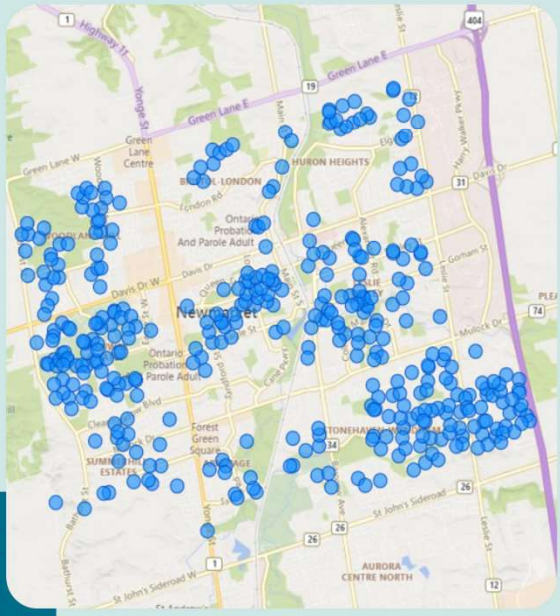
02. Energy Characteristics

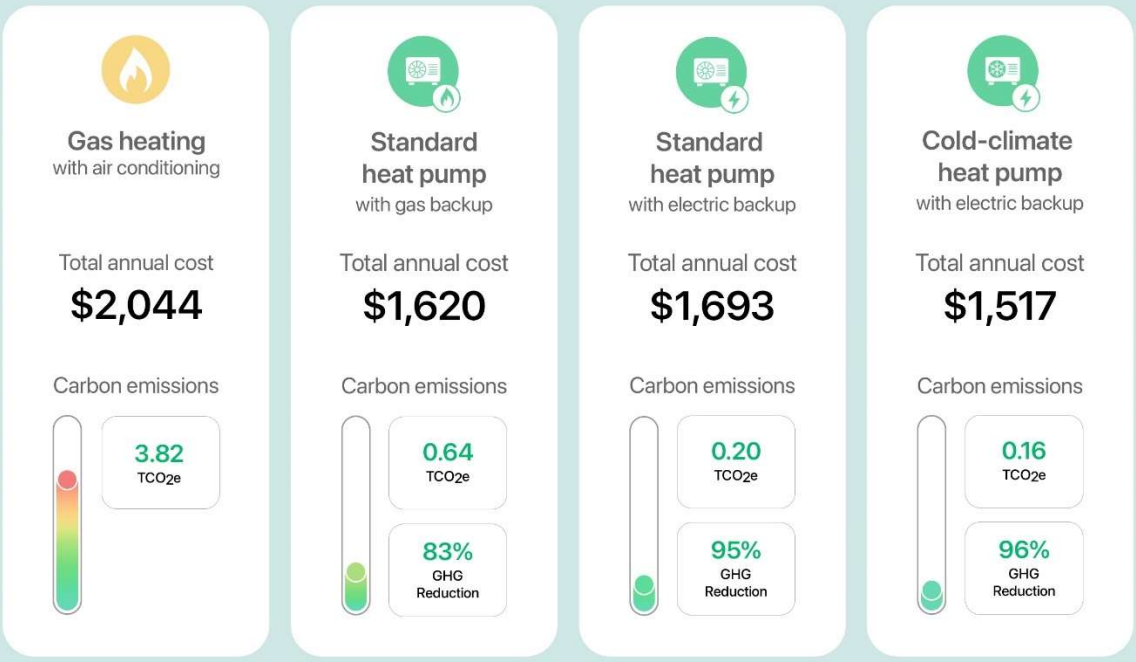
Example home **before** retrofit:

*Based on OEB Cost Calculator 2023

Annual Electricity Consumption **9,624 kWh**	Annual Electricity Cost* **$1,764**
Annual Natural Gas Consumption **4,593 m^3**	Annual Natural Gas Cost* **$2,423**
Annual Energy Cost **$4,187**	Annual GHG Emission **9.1 Tonne CO_2e**

03. Distribution

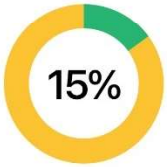




Calculation methodology and assumptions provided in the final report.

04. Opportunity

Market Potential



Market Size

~3,800 Homes

Replace furnace with air source heat pump providing heating and cooling

Additional energy and GHG reductions can be attained through insulation upgrades, air tightening, heat pump hot water heating, and building envelope upgrades.

05. GHG Savings Potential

Market Penetration	Number of Homes	Total GHG Emission Reduction (Tonne CO_2e)*
10%	380	1,375
25%	950	3,438
50%	1900	6,876
80%	3040	11,002

* Based on standard heat pump with electric backup.

Home Type D

With finished basement

01. Physical Characteristics

Type	Location	Central AC	Structure Quality
Detached, mostly 2-story 3 or 4-bedroom homes	**All Wards**	**~76%**	**Mostly 6.5 and some 6**

Finished Area

3,239 sqft*

1,023 sqft — 14,637 sqft

Assessed Value

$991,890*

$378,000 — $3,894,000

* Average value for Home Type D

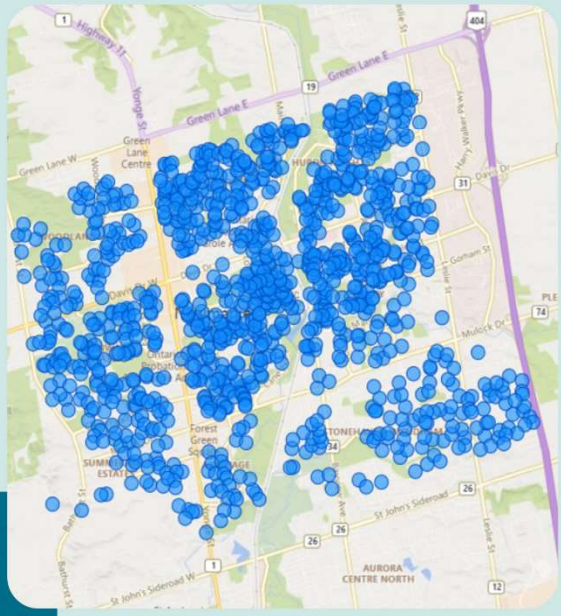
02. Energy Characteristics

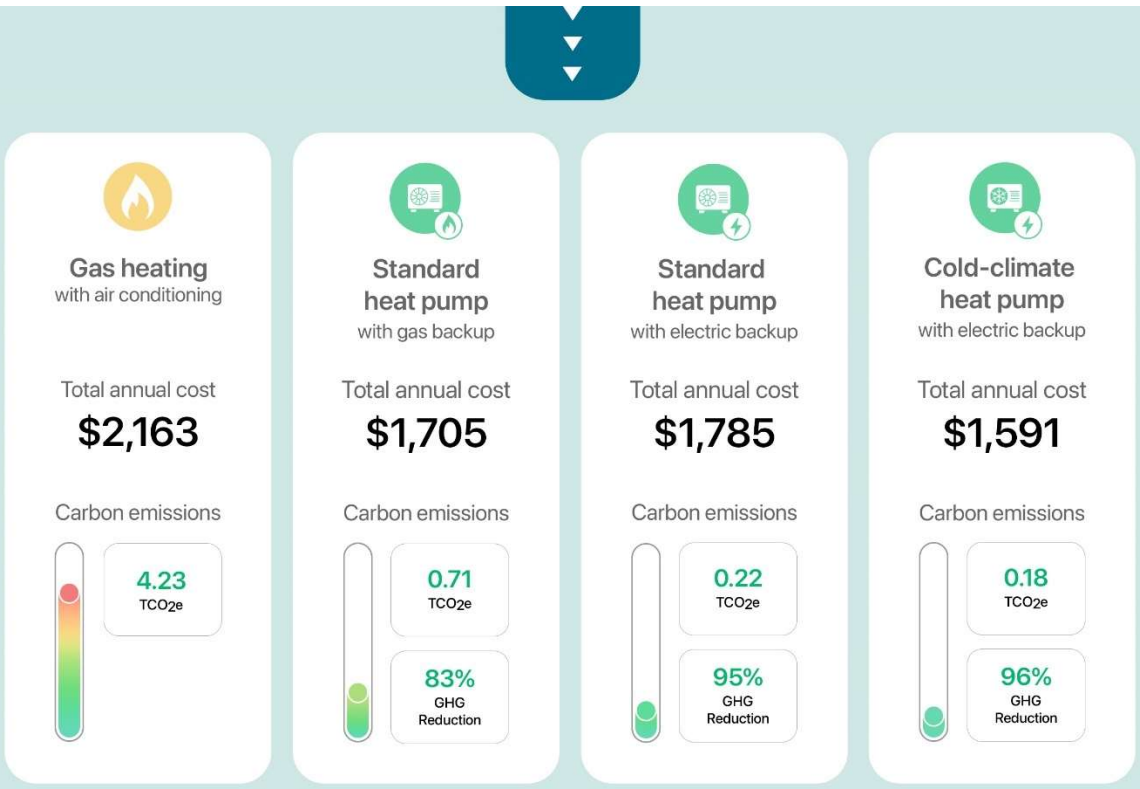
Example home **before** retrofit:

*Based on OEB Cost Calculator 2023

Annual Electricity Consumption **9,678 kWh**	Annual Electricity Cost* **$1,772**
Annual Natural Gas Consumption **4,223 m^3**	Annual Natural Gas Cost* **$2,287**
Annual Energy Cost **$4,059**	Annual GHG Emission **8.4 Tonne CO_2e**

03. Distribution

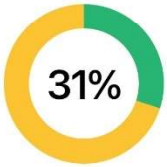




Calculation methodology and assumptions provided in the final report.

04. Opportunity

Market Potential



Market Size

~8,000 Homes

Replace furnace with air source heat pump providing heating and cooling

Additional energy and GHG reductions can be attained through insulation upgrades, air tightening, heat pump hot water heating, and building envelope upgrades.

05. GHG Savings Potential

Market Penetration	Number of Homes	Total GHG Emission Reduction (Tonne CO_2e)*
10%	800	3,203
25%	2000	8,007
50%	4000	16,014
80%	6400	25,623

* Based on standard heat pump with electric backup.

Home Type E

Semi-Detached, Townhouses, Rowhouses

01. Physical Characteristics

Type	Location	Central AC	Structure Quality
Mostly 2-story 3-bedroom homes without basement	**All Wards, more in 3, 4 and 6**	**~57%**	**6.5**

Finished Area

2,224 sqft*

886 sqft — 6,721 sqft

Assessed Value

$479,791*

$231,000 — $1,413,000

* Average value for Home Type E

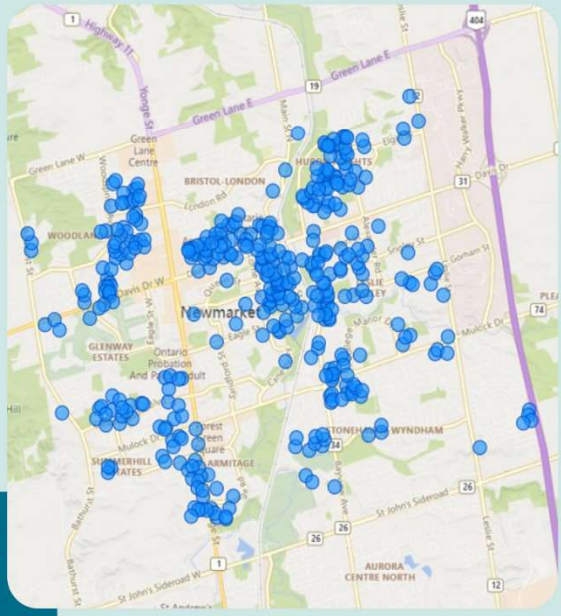
02. Energy Characteristics

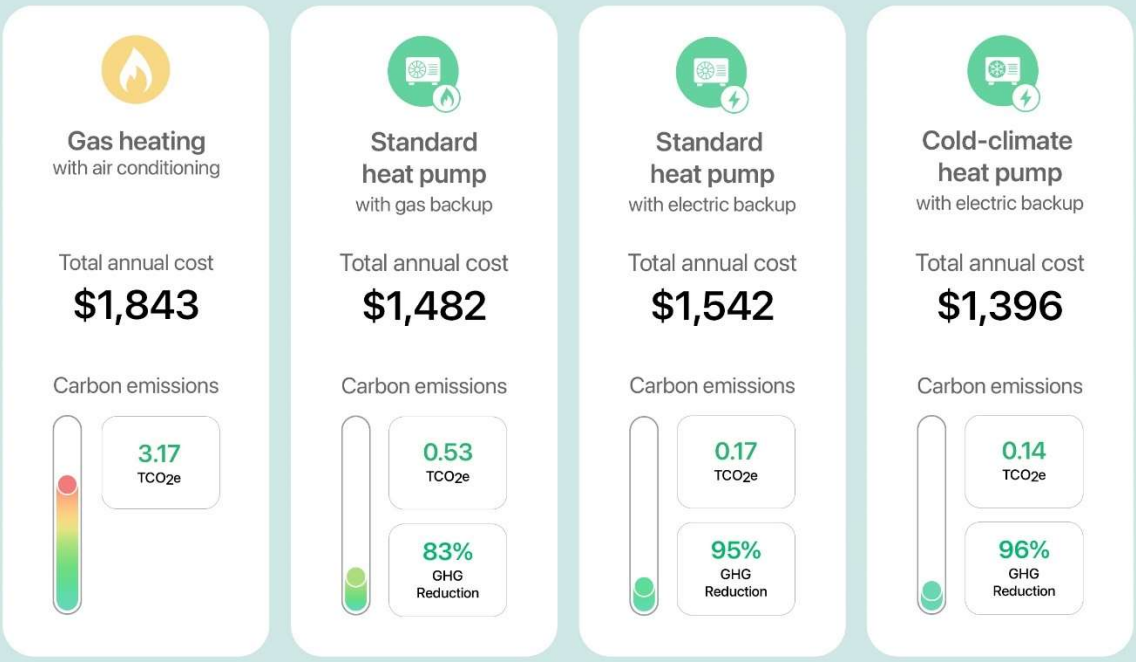
Example home **before** retrofit:

*Based on OEB Cost Calculator 2023

Annual Electricity Consumption: **8,903 kWh**	Annual Electricity Cost*: **$1,660**
Annual Natural Gas Consumption: **2,532 m^3**	Annual Natural Gas Cost*: **$1,501**
Annual Energy Cost: **$3,161**	Annual GHG Emission: **5.1 Tonne CO_2e**

03. Distribution

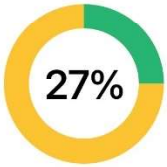




Calculation methodology and assumptions provided in the final report.

04. Opportunity

Market Potential



Market Size

~6,900 Homes

Replace furnace with air source heat pump providing heating and cooling

Additional energy and GHG reductions can be attained through insulation upgrades, air tightening, heat pump hot water heating, and building envelope upgrades.

05. GHG Savings Potential

Market Penetration	Number of Homes	Total GHG Emission Reduction (Tonne CO_2e)*
10%	690	2,071
25%	1725	5,178
50%	3450	10,357
80%	5520	16,571

* Based on standard heat pump with electric backup.

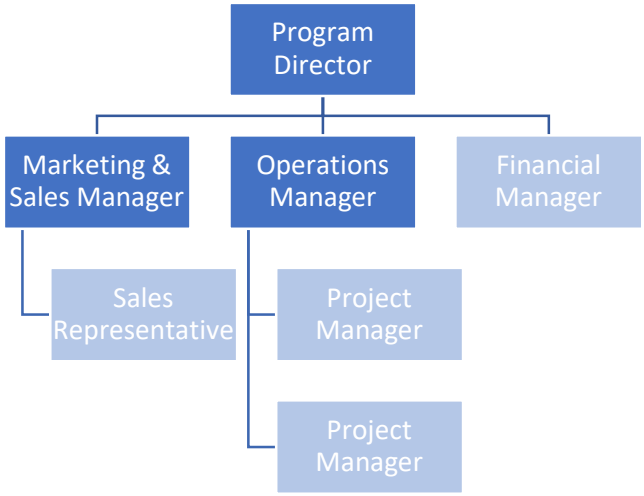
4.2. Operations Management

The operations management will be outsourced to an Implementation Partner. The relationship with the Implementation Partner will be governed through an Operations Management Agreement. The general role of the Implementation Partner is providing all services related to start-up, launch, and operations necessary to implement the NEER-BP. These activities will include all functional roles related to:

- Marketing
- Information technology
- Human resources
- Operations management including customer service and support, project management, contractor contract management and quality assurance
- Finance including accounting, tax filings, and project financing for LIC projects
- Reporting

The start-up human resources plan will include a Program Director, a Marketing & Sales Manager and an Operations Manager. In Exhibit 10, the start-up organizational structure is presented in dark blue with incremental additions in light blue. Additional resources can be ramped up as volumes increase.

Exhibit 11 Human resource organizational chart



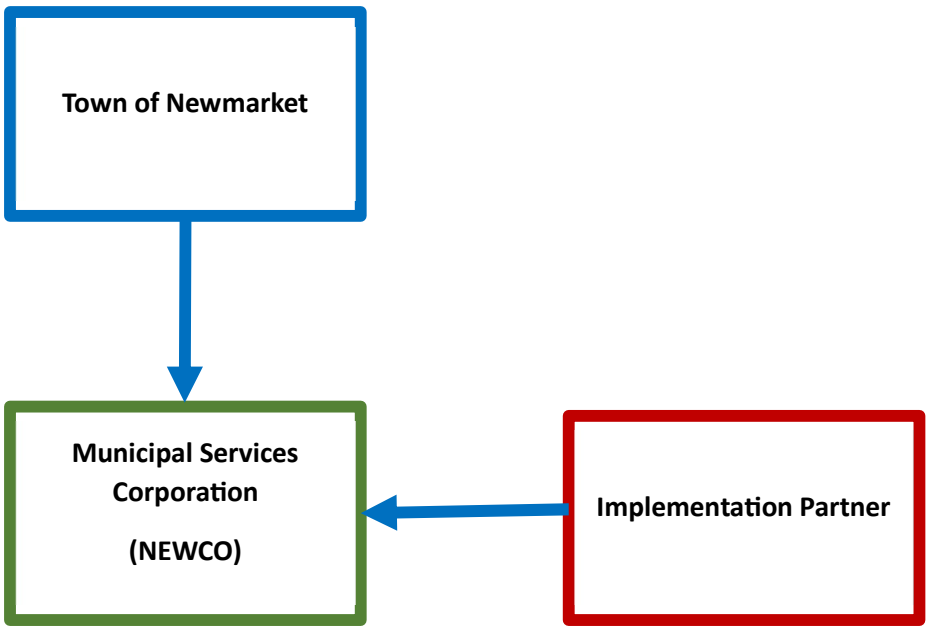
The roles and responsibilities of the start-up and growth team are described in Exhibit 12.

Exhibit 12 Summary of roles and responsibilities for the start-up and growth team

Role	Responsibility
Program Director	• Overall accountability to implement the NEER-BP • Build the human resource team starting with detailed job descriptions, recruit plan, and talent on-boarding • Implement the detailed design and build of Concierge 2.0 • Approve all customer contractors • Administer all banking, insurance requirements, business licensing, etc. • Prepare all financial reports including annual budgets and forecasts • Work with external advisors and professional advisors including legal and accounting • Prepare all reporting and be a point of contact for the Town of Newmarket
Marketing & Sales Manager	• Responsible for refining and implementing the marketing and sales plan from the NEER-BP • Prepare all marketing designs for the website and creative content for Concierge 2.0 • Developing the detailed target market analysis • Preparing the details of the channel strategy • Develop a CRM system and sales tracking • Establish customer services standards • Prepare reports for marketing activities and sales pipeline reports
Operations Manager	• Responsible for developing and implementing policies, procedures, plans for customer service and support, project management, contractor contract management and quality assurance • Prepare all customer energy retrofit contracts • Ensure all energy retrofit projects are completed on schedule and on budget • Complete all quality assurance requirements • Prepare all operational reports

5. Governance and Ownership

The business structure proposed is a municipal services corporation created under the *Municipal Act, 2001*, S.O. 2001, c. 25 as recommended by Aird Berlis. The organizational structure will be as follows:



NEWCO will be governed by a Board of Directors appointed by the Town and the Implementation Partner. The governing documents of NEWCO will include the articles of incorporation, corporate by-laws, and a Shareholders Agreement between the Town and the Implementation Partner.

6. Operating Model & Plan

The business structure section above provided the details of the internal functions and business processes necessary for NEWCO to deliver the NEER-BP. This section provides the details of the operating model and plan to implement the energy retrofit projects.

This business plan, as was the case with the business case, is drafted to create a self-sustaining commercial entity. In other words, NEWCO is intended to be financially independent from Newmarket. NEWCO is eligible for start-up and on-going financial support from the Federation of Canadian Municipalities administered program through the Green Municipal Council called Community Efficiency Finance (CEF). Funding from the CEF Program will be passed through to homeowners to lower costs to convert to heat pumps.

6.1. Turnkey Solution Operating Model

The operating structure and plan for NEWCO were presented to key stakeholders from the Town on November 22, 2023

The principles that were leveraged from the prior business case included a turnkey approach, focus on cost-savings through marketing and operational efficiencies, incorporated a municipal services corporation as the delivery entity. The turnkey approach streamlines the purchase process for homeowners. NEWCO can scale towards the Community Energy Plan targets by applying technology (Concierge 2.0 and an operations automation platform), focusing on heat pumps to maximize GHG emission reductions, and simplifying contractor relationships as only HVAC contractors are needed.

Exhibit 13 provides an operating model where NEWCO provides a turnkey solution for the homeowner. This operating model provides the homeowner with a single point of contact and responsibility. NEWCO undertakes all the outreach and marketing necessary to identify, inform, and contract homeowners to participate in a program that offers the installation and financing of an energy improvement program. The operating model will address two fundamental issues in the current market:

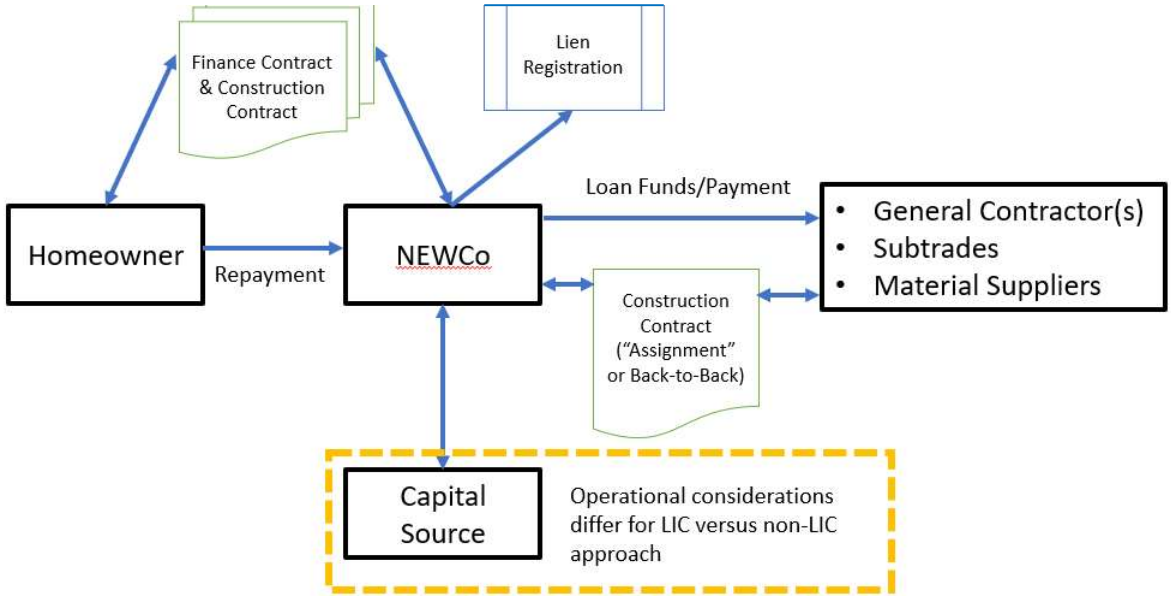
- Offering homeowners with unbiased and trusted information related to heat pumps
- Provide cost savings by passing on scale efficiencies and discounts to homeowners

For example, there is significant variation is prices provided by contractors often unrelated to business operating costs but related to current availability or capacity of the individual contractor. In other words, contractors often provide higher project quotes based on their short-term ability to undertake additional projects. NEWCO would be able to manage this better through a network of pre-qualified contractors.

Another important feature of this operating model is the LIC financing which can have extended repayment terms that align monthly repayment with the energy cost savings. The LIC finance structure is also fully transferred to a new owner of the property. This finance portability is an added feature as the existing homeowner pays for the energy savings benefits while they live there and then transitions upon sale of the home.

This operating model is also streamlined to focus on heat pump retrofits during the start-up phase and until consumer demand dictates the addition of new measures. That is, NEER-BP implementation will get market feedback before adding more measures.

Exhibit 13 Operating Model: Turnkey solution



The turnkey operational solution is premised on the following activities:

- Standardized process to provide a custom price quotation for energy efficiency retrofit
- Standard form construction contract between NEWCO and the homeowner
- Establishing contractor code of conduct, customer service standards, health and safety compliance, and warranty provisions
- Registration and "strategic partnership" contractor agreement including specialists in complex HVAC systems such as multi-modal systems such as forced air, hydronic, and electric systems.
- "Strategic partnership" with heat pump manufacturers or distributors
- "Strategic partnership" with weatherization contractors
- "Strategic partnerships" with lenders

Simultaneously, with the operational activities above, Concierge 2.0 and the operational technology platform will be developed and launched.

6.2. GHG Reduction Expected Outcomes

Exhibit 14 provides the percentage GHG reduction from the total GHG emissions for each target market segment. The infographics for each target market segment provided heat pump configurations with either natural gas back-up heat pump, electric back-up heat pump, or cold-climate heat pump with electric back-up. As shown in the infographics, the GHG reduction and energy cost savings differ by the heat pump configuration for back up heat. In addition, the initial capital cost will differ based on the heat pump sizing and back-up option. In exhibit 13 we have assumed an equal mix of the three heat pump configurations shown in the target market infographics. That is, the assumption is homeowners will be equally split between the configuration that they will select and the program will support them in making the most informed decision given their budget among other considerations.

The orange column includes GHG savings associated with weatherization such as new caulking, exterior wall outlet sealing, and weatherstripping. The gray column includes the conversion a natural gas hot water heater to a heat pump water heater. The graph demonstrates a range of GHG reductions with Type C and D home types with slightly lower reductions and Type A, B and E homes producing higher GHG reductions.

As an example, to read the chart, for target market Type A, a heat pump will reduce the homes GHG emissions about 56%, installing a heat pump and weatherization will reduce emissions by 59%, and converting hot water heating from natural gas to a heat pump water heater will reduce emissions by 87%.

Exhibit 14 Estimated GHG Emission Reduction by Technology Package

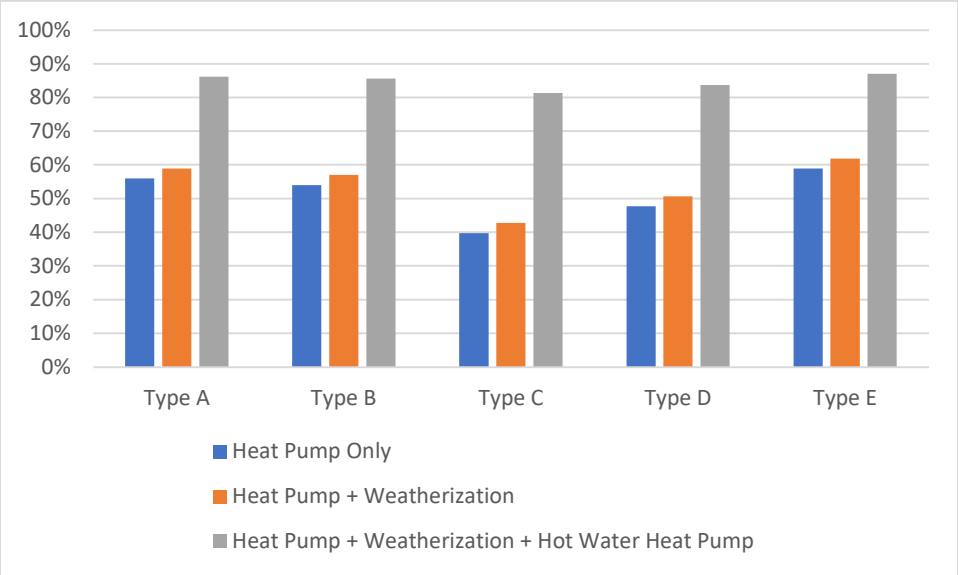
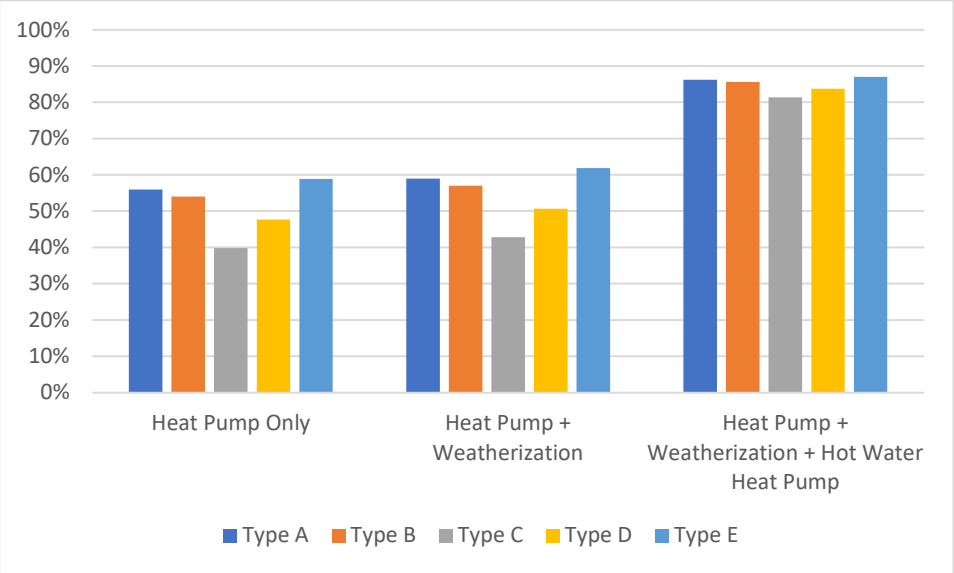


Exhibit 15 provides a different data visualization for the GHG reduction based on home type for the same technology measures. This graph demonstrates an 80-88% GHG reduction is achievable for all home types by installing a heat pump, weatherization, and a heat pump hot water heater. The GHG reduction potential ranges from 40-61% for heat pump only and combined with weatherization.

Exhibit 15 Estimated GHG Emission Reduction by Home Type



The above exhibits demonstrate that the GHG reductions estimates can reach the GHG reduction goals within the Community Energy Plan. In other words, given that the individual home GHG reduction aligns with the Community Energy Plan, hence to reach the aggregate GHG emission target can be reached through market penetration over the planning horizon.

Exhibit 16 Predicted Aggregate Residential Emission Reduction at Various Penetration Levels

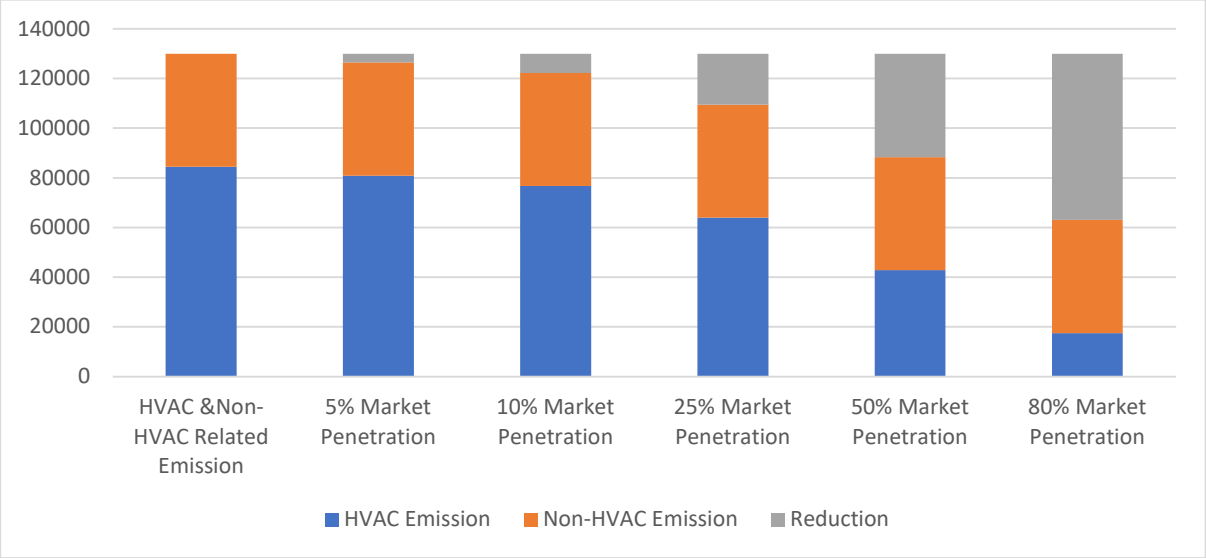


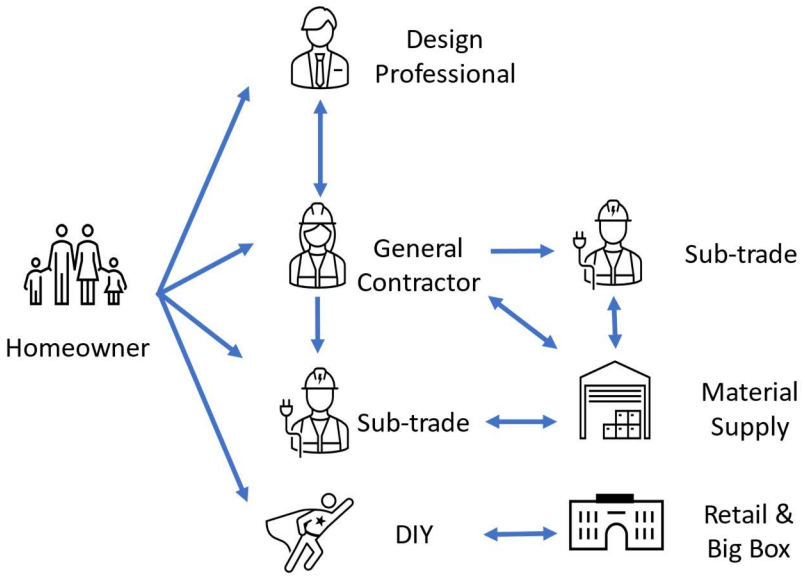
Exhibit 15 demonstrates the emission changes of residential sector at various market penetration levels. The gray bar shows the emission reduction at each market penetration. The leftmost bar indicates that approximately 65% of residential emissions is related to HVAC and the remaining related to water heating and cooking. The exhibit shows the GHG emission reduction in gray at different market penetration of air-source heat pumps to replace natural gas furnaces. This exhibit does not show any GHG savings related to conversion of natural gas hot water heaters to heat pump water heaters.

To highlight the 80% market penetration, HVAC emissions will drop from 82,000 tonnes to 18,000 tonnes producing a reduction of 64,000 tonnes. With air-source heat pumps at 80% penetration, total emissions from homes can be reduced by 50%.

6.3. Existing Market Structure

The current market structure for renovations and retrofits is provided in Exhibit 17. This market structure was explicitly identified for improvement in the Business Case, to eliminate market imperfections and economic transaction costs.

Exhibit 17 Current Market Structure



In the current market, homeowners can engage a design professional to develop the design and specifications for the renovation or retrofit. This is typically done for large renovations that interact with several systems of the home such as mechanical, structural, electrical, and finishings and often require permits. General contractors ("GC") often have relationships with designers in cases where homeowners select the general contractor. Sometimes homeowners act as their own general contractors and select the individual sub-trades and some homeowners are skilled enough to be "do-it-yourselfers" (DIY).

The current market structure exhibit does not include the project financing component as homeowners will use savings or existing credit facilities. An important role within the current market structure is the GC. The GC is the quarterback and maintains existing relationships with sub-trades and material suppliers. During periods of tight labour markets and trade shortages, the GC's role is critical. Specifically, the activities of a GC include the following:

- Executes and maintains the construction contract with the homeowner including project scope and specifications, price, and schedule
- Assumes the construction risks including health and safety, cost overruns, schedule delays
- Manages all sub-trades and material supply including:

- Work planning and sequencing
- Attains necessary permits
- Retains qualified sub-trades
- Material supply and delivery arrangements
- Inspections, deficiencies, and quality assurance
- Dispute resolution
- Payments and settlements
- Project commissioning, post project documentation, and final inspection

6.4. NEER-BP Differences to the Prior Business Case

The prior business case incorporated a turnkey solution that was anchored to a comprehensive package of energy retrofit measures and a fixed price model based on a dollar per square foot approach. Given the more depth analysis, the NEER-BP has diverged as follows:

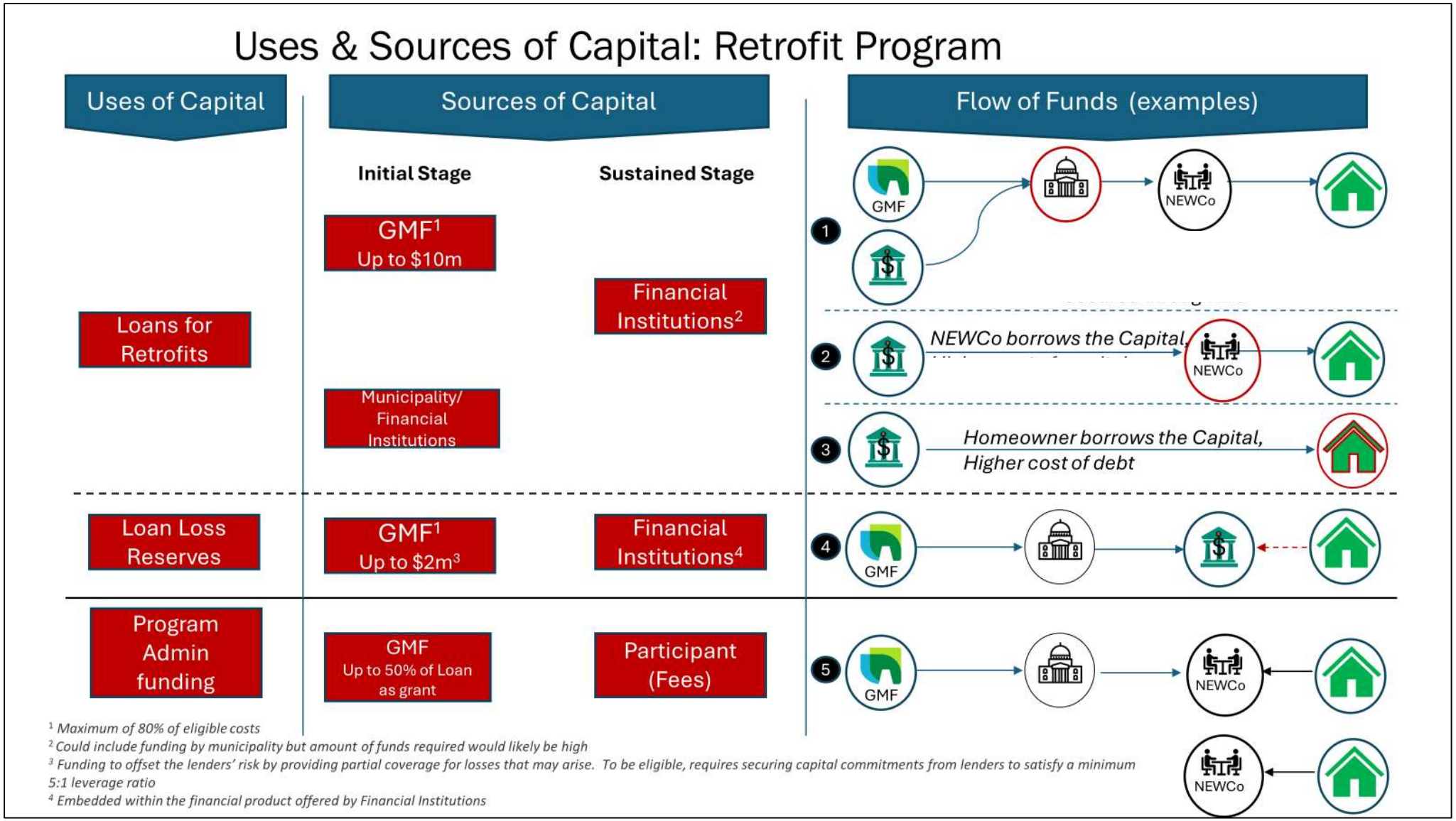
- Simplified turnkey key approach focused on replacing natural gas furnaces with electric heat pumps with an ability for homeowners to add "a la carte" additions of other retrofit measures
- Energy retrofit budgeting through Concierge 2.0 and custom price quotations for each project based on a site visit

These two fundamental changes were made to develop an easier to deliver turnkey product offer and reduce the exposure to pricing risk. Focusing on a single measure like heat pumps is simpler as only specialized HVAC contractors. The fixed $/sq ft pricing approach implicitly assumed that on average the price would be right as some homeowner's price may be higher and some lower. A custom cost-basis approach eliminates the risk of average $/sq ft prices that may be too high or too low depending on conditions at each home.

6.5. Capital Sources of Energy Efficiency Improvement Loans

Exhibit 18 below was provided during the November 9, 2023 with Newmarket's Core Team and members of the Steering Committee to explain the various sources and uses of funds. The exhibit depicts both the initial stage and a sustaining stage for capital sources. The NEER-BP is designed to source initial stage capital from the Green Municipal Fund with some potential augmentation from a financial partner. The sustained stage transitions to attracting private capital and a self-sustaining business model without the need for public funds. The flow of funds shows that GMF funding can flow through Newmarket to NEWCO or directly to NEWCO and during the sustained stage NEWCO will partner directly with lenders to bundle financing with the GHG reduction projects. All financial risks are contained with NEWCO.

Exhibit 18 Sources of Capital



All business plans and business operations contain risks. NEER-BP is designed to leverage a business opportunity given market imperfections. That is, individual homeowners do not have sufficient economic incentive to complete energy retrofits as carbon pollution is an externality to their decisions. An energy retrofit program tries to address the barriers associated with consumers considering GHG emissions within their decision-making process. As such the risks must be considered within the context of the rewards of the opportunity.

There are four key risk areas of the NEER-BP and the operations of NEWCO. They are as follows:

- GHG targets and participation risk
- Financial risk
- Operational risk
- Reputational risk

Political risk is not separately assessed but the most significant political risk is if funding is eliminated via a change in government policy.

6.6. Targets and Participation Risk

Newmarket has stated specific and aggressive targets and goals related to GHG emission reduction and energy savings. The NEER-BP is aligned to meet the GHG emission reduction targets within the Community Energy Plan.

Business Activity	Risk Scenario	Mitigation
GHG targets not attained	The overall five-year target of the NEER-BP is not attained.	• Plan to implement an effective operating model and curated GHG reducing measures. • Allocate sufficient budget to marketing and sales • Implement annual reporting
Participation volume	Milestone volumes are not attained	• Measure and monitor the sales pipeline on a monthly basis of contacted, interested, quoted, and closed projects • Measure and monitor the conversion rate from pre-sales to close • Implement monthly and quarterly reporting • Adjust sales and marketing efforts to increase participation volume • Adjust product offer and/or pricing to attain sales volume

6.7. Financial Risk

Newmarket's financial risk is primarily mitigated through funding from GMF's CEF program and an Implementation Partner to manage the program performance and assume residual financial risks.

Business Activity	Risk Scenario	Mitigation
Operating costs surpass revenues	Revenue doesn't keep pace with costs	• All businesses require start-up costs, fixed infrastructure costs, and operating costs that must be incurred to generate sales. • Prepare an annual budget forecast and plan • Measure and monitor quarterly financial performance
Capital sourcing is too expensive	Interest rates are not competitive	• Benchmark interest rates with current alternatives • Credit underwriting standards reduce credit risk to allow competitive interest rates
Credit risk and default risk of loans	Homeowners fall into arrears or default on loans	• Implement credit policies such as loan-to-value ratios to mitigate lending risk • Measure and monitor loan portfolio performance • Design and plan activities to respond to arrears • LIC's are secured via a registered property lien and collected through taxes • Credit risk is transferred to other lenders if homeowner doesn't use an LIC
Unknown construction costs	Project cost overrun related to unknown factors	• All projects must have written contracts • All projects must have site visits to confirm site conditions and site access
Performance issues of contractors	Contractors are delayed, do not complete a project, or under-estimate the budget	• All projects must be contracted with scope, price, and schedule specified • Pay contractors in 30-day arrears • Implement quality assurance before payment approvals • Implement project holdbacks
Health and safety exposure	Work site accidents	• Perform due diligence on all parties for health and safety practices • Validate WSIB compliance • NEWCO is a legal shield

6.8. Operational Risk

Program operational risks stem from the program staff of the Implementation Partner and in-field contractors' personnel. The overall risk mitigation will flow from the contracts, training, and performance monitoring.

Business Activity	Risk Scenario	Mitigation
Construction health and safety	Workers are exposed to health and safety risks	• All contractors must provide safety records and workers compensation claims history • All contractors must provide clearance letter from workers compensation (WSIB) • All construction contracts will contain health and safety provisions • Random site inspections for safety audits by NEWCO staff • Safety scorecards for all contractors • COR certification
Project performance issues	Installed measures do not perform as expected for energy and GHG reductions	• Equipment sizing completed to standards • All projects must complete a commissioning checklist to ensure specified equipment is installed and operating to manufacturers specification • Post project follow up completed with homeowner • Review of commissioning reports
Program staff are unprofessional	Program staff behaviour is below standard	• All program staff and construction personnel must complete training in code of conduct • Documented escalation procedures • Customer service surveys for all completed projects • Measure and monitor customer satisfaction

6.9. Reputational Risk

Reputation risk is an important consideration and must be managed. Reputation risk is often an outcome of other risks such as operational or financial. Inherent in reputation risk is political risk as government funded programs can be politized especially during poor performance.

Business Activity	Risk Scenario	Mitigation
Excessive or significant customer complaints	Unrectified customer complaints are escalated	• Address performance issues rapidly, be responsive • Implement customer service standards that exceed the renovation industry • Provide clear escalation framework for customers to address issues
Performance standards are below expectations	Program delivery or energy retrofits are below standard	• Implement performance standards through contracts • Measure and monitor performance • Prepare performance reports

Appendix A: Detailed Market Potential

Overview

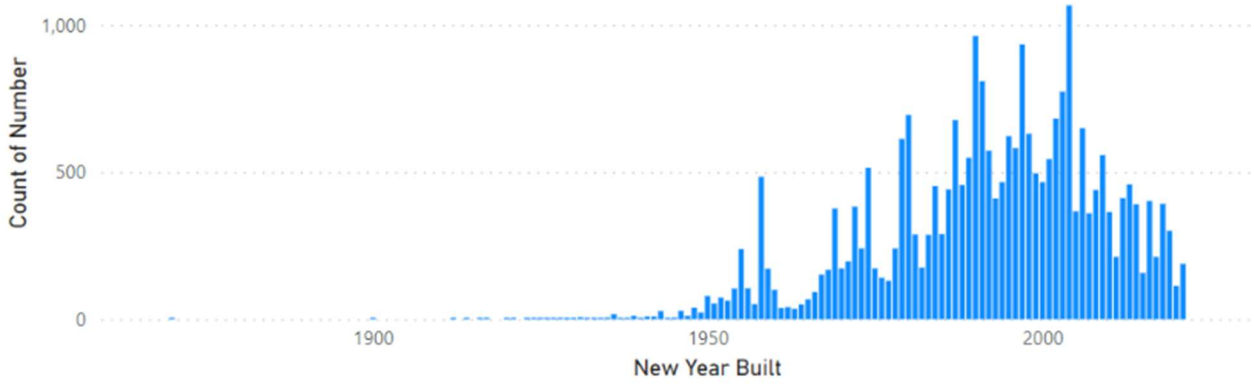
1. Housing stock analysis
2. Other programs integration
3. Current market structure

For the first phase, existing, low-rise residential properties (e.g., detached, semi-detached, row housing and similar) are eligible for NEER. This business plan focuses on these single-family homes with information provided by MPAC. Detached homes are most commonly found in Newmarket with around three quarters of total single-family homes.

The table shows the number of houses in each category.

Category	Number of Houses	Percentage
Detached Home	19037	73.5%
Semi-detached Home	2946	11.4%
Row/Town Houses	3932	15.2%
Total	25915	

Exhibit above shows the distribution of the City's residential stock by age. Some old homes received major renovation which aligns with the building code at that time. The Ontario Building Code sets standards for residential properties, which impacts the basis of energy efficiency of new homes. 17% of homes were built before first Ontario Building Code became effective in 1975[10], 69% homes were built between 1975 and 2012 while 12% homes were built after 2012, the newest Ontario Building Code. Older homes usually have more energy saving potential.



Municipal Property Assessment Corporation (MPAC) creates and maintains a comprehensive database of information for each of the more than five million properties in Ontario for taxing purposes. It contains

[10] A History of the Ontario Building Code. Retrieved from Codenews.ca History of the Ontario Building Code

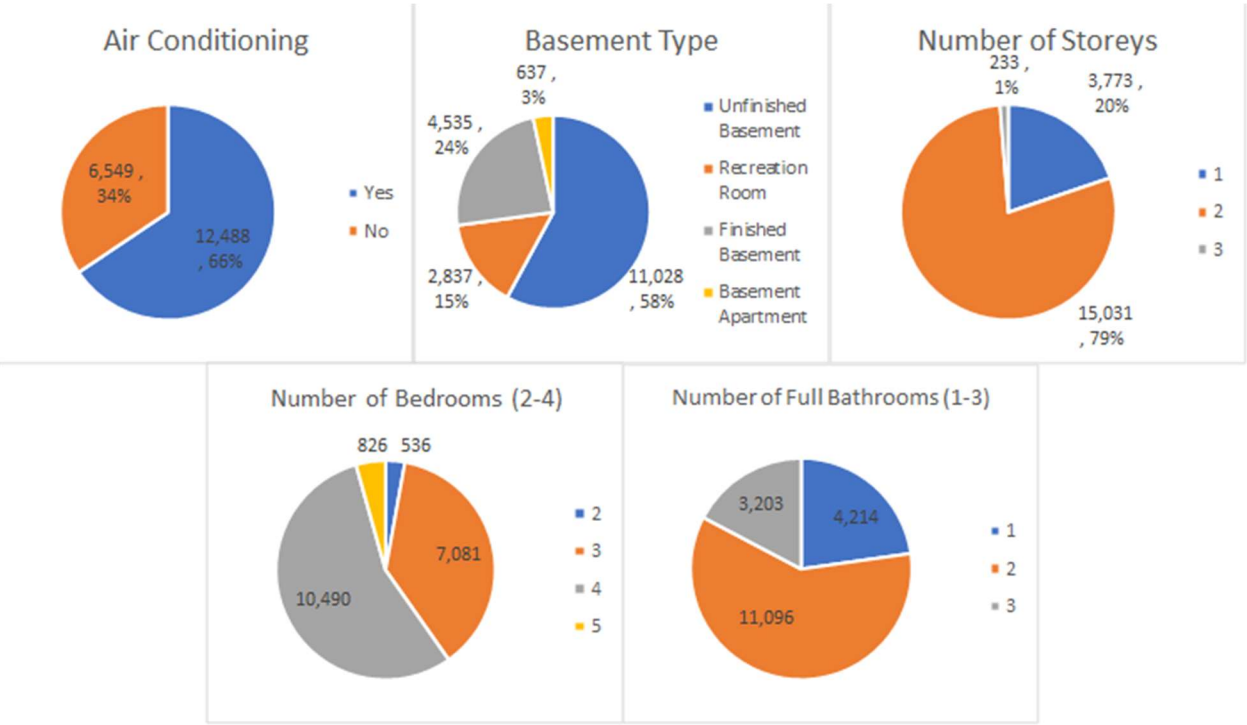
various characteristics to help with categorizing single family housing stock in Newmarket and identifying potential.

The MPAC data was uses to identify different indicators to find the target marketing for single family homes. The results are shown in the table below:

Indicator	**Target Market**	**% of total homes**	**Zones**	**Home Characteristics**	**Retrofit Suggestions (Reasons)**
Year Built Group	Older homes that built before 1975, when the first Ontario Building Code became affective.	7.3%	Zone 5 and areas Zone 2,3,4 adjacent to Zone 5	1-story 3-bedroom homes with basement but no AC. Most of them are 2000 sqft and the MPAC structure quality is 6.	- Building envelope upgrade / insulation / Weatherization (Cheaper for smaller homes and necessary for old homes) - Heat Pump (replacement of old furnaces, provide cooling for summer)
Assessed Value	Top 10% assessed value	13%	Mostly in Zone 1 and some in zone 7	2-story 4-bedroom homes with average of 20 years old, 5000 sqft total area and $1,000,000 assessed value. More than half of them have AC but without finished basement.	- Air Source Heat Pump and On-Demand Water Heater (end of life cycle, affordable) - Windows and doors - EV Chargers (affordable)
Gross Area	Top 10% gross area	10%	Zone 1 and Zone 7	2+ stories, 4+ bedrooms; similar to top 10% value	- Ceiling Insulation and air sealing (higher potential for larger homes) - PV Arrays (More areas avaible)

Detached homes represent around three quarters (19,037 out of 25,915) of single-family homes in Newmarket.

Some characteristics of the detached homes are shown in the Exhibit below.



Some insights that can be gained from these pie charts:

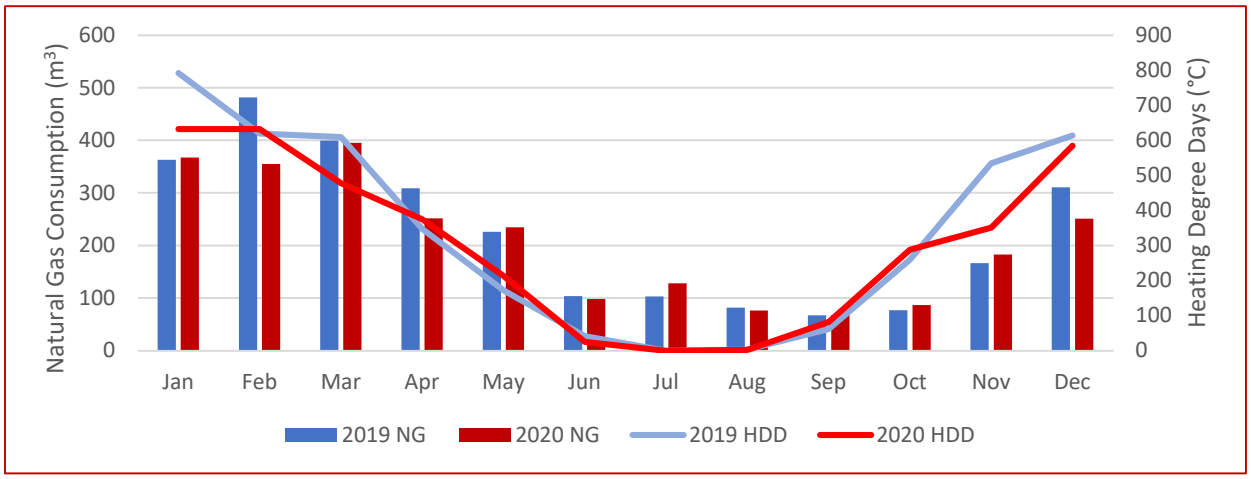
- A single stereotype cannot successfully represent the detached homes in Newmarket. The home energy retrofit can not be generalized. Each home requires a specific home energy retrofit plan based on the home characteristics and homeowners' preferences.
- A third of homes have no central AC. Considering the climate change and frequent heat waves in summer, AC installation may become a choice for the homeowners.
- Over half of the homes have unfinished basements. For homes with different levels of finished basements, the cost of home energy upgrades would vary.
- Most homes have two storeys
- Most homes have three or four bedrooms. Since all bedrooms are required to have windows as per building code requirements, the number of bedrooms would also influence the retrofit costs.
- Number of full bathrooms would impact some co-benefits, for example, water savings.

Energy & Emission Reduction Potential

The Heating Degree Days using a balance points of 18°C of Newmarket is around 4000 °C annually. The average household natural gas consumption (m^3) in Newmarket is 2,686 and 2,493 respectively provided by Enbridge.

Exhibit below shows the relationship between natural gas (NG) consumption (m^3) and heating degree days (HDD) (°C) for 2019 in blue and 2020 in red. Natural gas usage is closely related to the heating degree days. There is not a significant difference in natural gas consumption year over year (2019-2020); gas consumption usually peaked in February and March.

Exhibit 19 Newmarket Average Household Natural Gas Consumption (m3) vs Heating Degree Days (°C), Enbridge and Environment Canada (2019-2020)



In assessing the potential for home energy retrofits, we reviewed the data provided by Natural Resources Canada (NRCan) of all homes in Newmarket that have previously participated in energy efficiency incentive programs (EnerGuide Program) in the years between December 2006 and July 2022. NRCan energy efficiency programs typically require participating homes to undertake energy audits before and after a retrofit. Energy auditors perform a home visit and use HOT2000 model software to input collected data, with the software calculating annual modelled energy consumption for the household. The pre-audits provide homeowners with a range of energy efficient measures that they could undertake to improve their homes energy performance. In total, there are 4,641 pre audits entries. The post-audits assess the energy performance of the homes after retrofit and document the homeowners retrofit choices. The NRCan data is valuable in assessing past and current uptake of homes in residential energy efficiency programs and provides a source of detailed primary information on energy performance of homes that have participated in energy efficiency programs.

Energy consumption is closely linked to fuel types of energy measures. Table below shows the distribution of fuel types for furnace and PDHW (Primary Domestic Water Heater)

	Furnace Fuel	Furnace Fuel %	PDWH	PDWH %
Natural Gas	4,338	93%	4,299	93%
Electricity	186	4%	306	7%
Oil	109	2%	29	<1%
Propane	7	<1%	7	<1%
Hardwood	1	<1%	-	-
Total	4,641	100%	4,641	100%

The Exhibit below shows number of air changes per hour and the RSI value of ceilings, foundation walls, and main walls vs year built group. The homes built before 1975 have very poor performance for airtightness – higher than average. In general, newer homes have better insulation. Group A and B (homes built before 1986) have RSI below the average. The earliest year built group need to increase RSI value 65-80% to reach the latest year group

Year Built Group	Average of AIR50P	Average of CEILINS	Average of FNDWALLINS	Average of MAINWALLINS
A. <1975	7.92	3.12	0.88	1.61
B. 1975-1985	5.50	3.74	1.34	2.09
C. 1986-1996	4.56	4.32	1.57	2.37
D 1997-2004	4.80	4.39	1.58	2.73
E. 2005-2011	4.27	5.17	1.50	2.96
F. >2011	3.64	5.06	1.51	2.72
Total	**5.55**	**3.93**	**1.36**	**2.17**

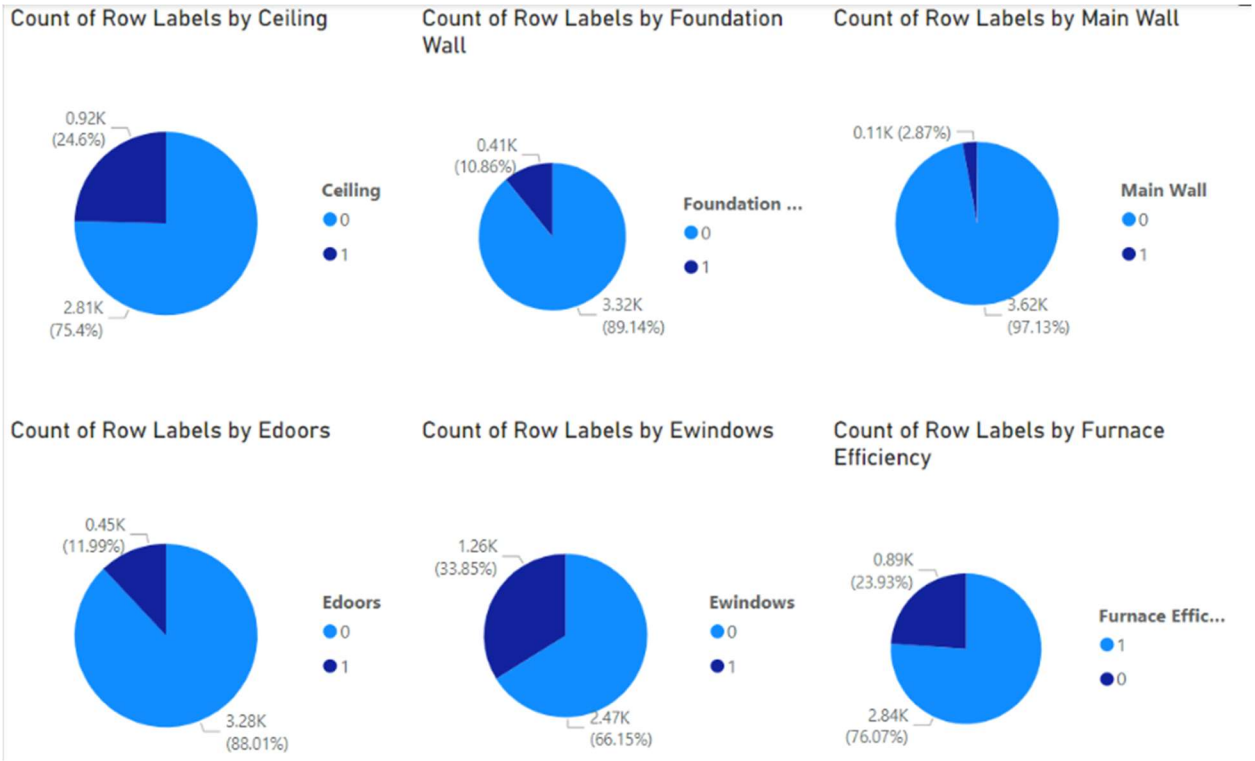
Current Market Structure for Renovations

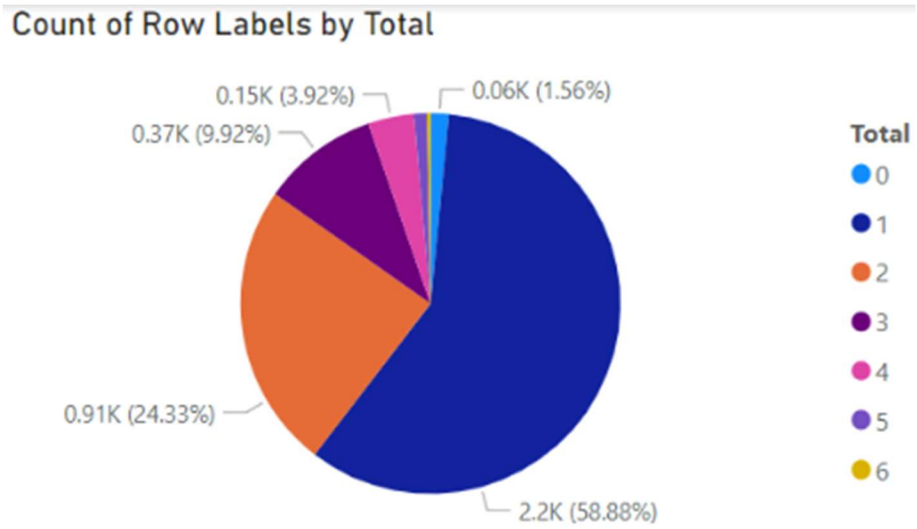
The NRCan dataset can also be used to assess the retrofit projects that were completed.

- Retrofit projects are in the homes with both D and E labeled, where D represents the pre-auditing and E represents the post-auditing.
- There is total 3,728 homes have both D and E audits

The Exhibit below shows the percentage of households that undertook single retrofits. From top left to bottom right are 1) ceiling insulation, 2) foundation wall insulation, 3) main wall insulation, 4) Energy-Star certified doors, 5) Energy Star certified windows and 6) Increase in furnace efficiency. The most common project was to replace windows (34%), followed by increasing insulation for ceilings (25%) and increasing furnace efficiency (24%). Main wall insulation projects were the least popular retrofit.

Customer preferences for projects helped to design the retrofit package for the NEER-BP.





The Exhibit above shows the percentage of households that undertook a certain number of retrofits, up to a maximum of six different measures. 59% households only took a single retrofit action and about a quarter of households do two measures. For the Exhibit, 0 means simple air sealing and/or some other actions that were not recorded (fuel switch for furnace but may not increase the furnace efficiency). It provides two pathways for NEER – concentrate on single measure projects to get more enrollment or encourage more retrofit actions to achieve deeper savings.

Appendix A1: Critical Market Considerations

The business case and the NEER-BP have come to the same conclusion that there is a significant opportunity to support Newmarket residents to reduce GHG emissions. The NEER-BP is adopted one of the principal strategies from the business case to minimize costs and provide a compelling pricing approach for homeowners. However, NEER-BP has diverted from the business case to offer more consumer choice, a simplified product offer focused on replacing furnaces with heat pumps, and applying technology for client acquisition and workflow automation.

Heat pumps are still new to the market and pricing has a wide distribution for both equipment supply and installation. The product offering and technology innovation for heat pumps is improving rapidly. Since 2021, heat pump technology has been successfully applied to hot water heating and domestic clothes dryers. The NEER-BP is recommending offering the replacement of natural gas hot water heaters with heat pump water heaters.

The NEER-BP attained some market pricing data to replace furnaces with heat pump space heating and examined the NRCan data. Market pricing was attained through contractor surveys for a supply and install specification. The pricing was qualified based on many on-site parameters but had a distribution of 65% demonstrating the variation and custom nature of the retrofit. All the contractors used custom pricing that reflected “what the market will bear” and their current availability to complete the work. Effectively, contractors offered more competitive or lower prices if they were not busy and had the

resources and time available to complete the job. This makes sense as most contractors, especially if they do not do maintenance contracts, will not have repeat business until the next replacement cycle. Also, contractors vary in the use of referral and testimonial strategies as part of their marketing approaches.

Heat pump manufacturers were contacted as well. The equipment list price was available, but the volume discounts were closely guarded. The manufacturers also stated that equipment pricing is declining as volumes are increasing globally for heat pump use.

The NEER-BP has used higher heat pum pricing in the financial modeling for a conservative approach. Our expectation is that actual costing and consumer pricing will be better than the financial model and we expect equipment prices to continue to decline. The NEER-BP has used a "cost-plus" approach to ensure the best price for homeowners. That is, a fixed percentage was added to the modeled prices for equipment and installation services. The fixed percentage reflects the revenue required to sustain NEWCO's operational cost structure and financial considerations while considering the funding from GMF.

Given that NEER-BP used the higher pricing, declining equipment costs after an extended inflationary period, and a "cost-plus" approach, various pricing scenario analysis was not completed. Future higher price scenarios may impact participation rates as higher retrofit prices will worsen the project economics from a homeowner's perspective. However, the programs primary target markets is focused on homeowners replacing furnaces at the end of their economic life as opposed to early retirement. Although, NEER-BP will finance the full project cost, from a homeowner's perspective the project economics is based on the incremental cost of a heat pump over a new furnace. The NEER-BP has inherently assumed that replacing a natural gas furnace with another furnace will experience the similar level of price increases as heat pumps. Therefore, the comparative economics between replacing the furnace for the same or even higher efficiency furnace to a heat pump will remain constant. In fact, the evidence suggests that heat pump equipment prices are declining while furnace prices are stable. The installation labour to cost is higher to convert to a heat pump relative to a simple furnace swamp. The NEER-BP has assumed that labour cost inflation will be constant between the two installations and therefore marginal impact on the comparative economics.

Lastly, the NEER-BP has assumed the same interest rate regardless of the scope of energy retrofit such as high efficiency furnace swap out or conversion to a heat pump. Hence, there is no comparative advantage for financing costs.

From a marketing perspective, the key messages will focus on the environmental benefits, marginal incremental cost, improved comfort, combined heating and cooling, quieter operation, and improved safety from no combustion and the associated carbon monoxide and gas leakage issues.

Appendix B: Equity Consideration

Considerations of Equity in An Efficiency Financing Program

Kambo Energy Group and Reep Green Solutions released *Considerations of Equity in An Efficiency Financing Program* and listed four principles of an equitable financing program, which are:

1. Consumer protections: ensure the participants in the program can afford the loan
2. Late and non-payment processes: ensure the acceptance of late and non-payment
3. Reduce financial risk: embed protections to reduce participants' financial risk
4. Equity-based KPIs: monitor and ensure the program is equitable in practice

To include and protect Low and Moderate Income (LMI) households in the financing programs, the following recommendations are proposed:

1. Ensure strong consumer protections that guard households not in the target market
2. Outline the customer journey for participants who have non-payment or late payments
3. Redistribute the financial risk for LMI households in combination with consumer protections
4. Ensure upgrades that prioritize affordability and comfort are selected
5. Maximize the likelihood that anticipated savings re achieved through resident energy literacy and education
6. Develop a reliable and trusted contractor network
7. Design programs to remove barriers
8. Ensure renter protections and landlord participants

Fixed income and low income

Overview

The fixed income seniors and low-income households are very difficult to address within a "finance" program.

"Low Income Trends in York Regions" shows that 14% of the Newmarket residents are living in low income. The residents living with low income are from all ages and different family composition. The Census Family Low Income Measure (CFLIM-AT) is a fixed percentage (50%) of the median after-tax census family income. A person is considered to be in low income when their family income is below the CFLIM-AT threshold associated with their family size. The primary data source for the CFLIM-AT is T1 Family File (income tax database) developed by Statistics Canada.

2021 Census Release Report from StatsCan indicates that the median household income of Newmarket is $110,000 in 2020. 17% of household in Newmarket has household income below $50,000.

Program Design

Equitable financing program should consider the following during program design:

- Consumer protections. The program should have a comprehensive application review process. The underwriting criteria will help the financing program only accept participants who can afford the loan. The household income should not be the only criteria to consider; some other factors such as credit scores, household size and indebtness should also be assessed. Professional underwriters are recommended for the NEWCo to ensure the completion of each application
- Clearly defined late and default process. Late and non-payments are always a risk of the financing program. All stakeholders should understand and agree with the consequences of late and non-payments. Associated rules will be determined in the program design stage to dissolve the risk in the largest extent possible.
- Reducing financial risk for participants. The program could offer extra levels of support to help the applicants for the repayments. Some examples include lower interest rate for lower income families, financial supports from utilities, smaller size of the loan.
- Equity-based Key Performance Indicators (KPIs). Use KPIs to measure the equitable participation and performance so that the program can be adjusted accordingly.

Some other recommendations for program design:

- Prioritize and affordability to maximize reduction in consumption and increase comfort for low income households
- Ensure the finance program is able to inform low-income households about other offers that are available to them like OEB's programs, etc.
- Help low income families to understand how their own actions can reduce energy costs.
- Ensure service providers, including energy advisor and contractors, are reliable and experienced so that the work provided will in high quality
- Determine if either a "cross-subsidization" strategy or an ability to leverage other social programs.

Appendix C: Market Segmentation Methodology

- The market segments are developed based on
    - MPAC data set for single-family homes characteristics in Newmarket
    - NRCan EnerGuide data sets
    - Enbridge Natural Gas Consumption data 2019
    - NRCan Emission Factors and Reference Values June 2023
    - OEB Cost Calculator December 2023
- Four home types are developed for single detached homes, which represents around three quarters of single family homes in Newmarket. Type E represents all the rest, including semi-detached, row houses and townhouses.
- The first 4 homes types are for detached homes and developed based on certain filters, which are
    - Type A: the oldest homes that built before 1975. 1975 is the year when the first Ontario Building Code is released.
    - Type B: around 20 years old which were built between 1997 to 2006. Ontario Building Code was also updated in 1997 and 2006. Most home equipment life is around 20 years old so that the homeowners are more likely to change the furnace or make major renovation
    - Type C: top 20% assessed value (>$827). The expensive homes are usually larger and have more GHG reduction potential. Heat pumps and other upgrades that need more initial cost are accessible for this type.
    - Type D: homes with some level of finished basement. Finished basements require more HVAC and it would be easier to promote heat pumps
- The home types are not exclusive which means a home may be fit into various categories.

Physical Characteristics

All information were retrieved from MPAC data set and most common characteristics are marked. For finished area and assessed value, the minimum, average and maximum are represented in the chart. The MPAC quality classifications range from Class 1, which is the lowest, to a Class 10, which describes the highest degree of quality. Class 6 represents the common standard of construction for the time a home was built. Detailed info

Energy Characteristics

An example home was randomly selected from the NRCan EnerGuide data set for each home type. The annual electricity and natural gas consumption were retrieved from the modeling results.

All the costs are calculated based on OEB Cost Calculator which provides monthly costs with monthly consumption inputs. The electricity consumption is assumed equal for each month. The natural gas monthly distribution is calculated by following steps:

- Find the top 5 appearance of the home type on postal code level from MPAC data

- Gather the average household natural gas consumption for those 5 postal codes from Enbridge data
- Calculate the percentage of annual consumption for each month
- Apply the percentage with the annual consumption of the example home to get the monthly consumption

The GHG emissions is based on the annual consumption and the emission factors which were retrieved from Government of Canada Environment and Natural Resources.

For electricity, Ontario's GHG emission factor is 30 g CO_2^e/kWh electricity consumed.

For natural gas, the overall GHG emission factor is 1,932.355 g CO_2^e/m^3 natural gas consumed. The calculation is shown as below.

	CO_2 (A)	CH_4 (B)	N_2O (C)	Total emissions (A+B+C)
Natural Gas Emission (g/m^3)	1,921	0.037	0.035	
Global Warming Potential[11]	1	25	298	
Natural Gas Emission (g CO_2e/m^3) = emission x global warming potential	1,921	0.925	10.43	1,932.355

Distribution

The distribution represents the geographic distribution of the homes in each home type

Opportunity

The carbon emissions opportunities are demonstrated as the comparison between the base case, gas heating with air conditioning with three circumstances of installation: Standard heat pump with gas back up, standard heat pump with electric backup and cold climate heat pump with electric back up.

Gas Heating with air conditioning:

Total annual cost comes from the electricity consumption for air conditioning cooling during the summer time and natural gas consumption for gas furnace heating during the winter time.

The electricity load of air conditioning is calculated based on the assumption of extra electricity load for air conditioning during the hot seasons, which is shown as below:

[11] The Global Warming Potential (GWP) metric examines each greenhouse gas's ability to trap heat in the atmosphere compared to carbon dioxide (CO_2). The Intergovernmental Panel on Climate Change (IPCC) provided 100-year GWPs in its Fourth Assessment Report. Environment and Natural Resources, *Global Warming Potentials.* Retrieved from Global warming potentials - Canada.ca

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0%	0%	0%	0%	0%	20%	40%	45%	35%	20%	0%	0%

The air conditioning energy cost is calculated as the unit price of electricity ($0.12/kWh) and the electricity load.

The natural gas use for the furnace is the difference between total natural gas consumption and other natural gas consumption including water heating, cooking and so on. Because heating is usually not needed in the summer time so that the average consumption of July, August and September is considered as the monthly natural gas consumption for non-heating. The unit price of natural gas used is $0.50/$m^3$. Assume the original furnace efficiency is 78% and the energy output remains same after the replacement.

Standard heat pump with gas back up:

Assumptions: The Coefficient Of Performance (COP) of the heat pump is 3[12]; The energy consumption ratio for heat pump and natural gas back up is 9:1. Calculate the energy consumption required to produce same energy output. And then use the unit price to calculate new total annual cost and use the emission factors to calculate GHG emission reductions.

Standard heat pump with electric backup:

Assumptions: The COP of the heat pump is 3; The energy consumption ratio for heat pump and electric back up is 9:1. Thus, no natural gas consumption required after the replacement. Calculate the energy consumption required to produce same energy output. And then use the unit price to calculate new total annual cost and use the emission factors to calculate GHG emission reductions.

Cold climate heat pump with electric back up:

Assumptions: The COP of the heat pump is 3.5; The energy consumption ratio for heat pump and electric back up is 9.5:0.5. Thus, no natural gas consumption required after the replacement. Calculate the energy consumption required to produce same energy output. And then use the unit price to calculate new total annual cost and use the emission factors to calculate GHG emission reductions.

The market potential and market size represent the percentage and number of that home type of total single-family homes in Newmarket. The retrofit recommendations focus on the furnace replacement and some other supporting upgrades.

01. GHG Saving Potential

The market penetration is set as 10%, 25%, 50% and 80%, which is the target listed in the Community Energy Plan. The number of homes is calculated as the penetration rates multiply by the market size. And the total GHG emission reduction is calculated as the number of homes multiplied by the carbon emission reduction per home for the “Standard heat pump with electric backup” scenario, which is considered as the most acceptable case for residents.

[12] COP and other assumptions developed based on *Heating and Cooling With a Heat Pump* from Natural Resources Canada.

Appendix D: NEER-BP Integration with Other Programs

Existing Incentive Programs

As of September 2023, Newmarket residents have programs available from the IESO, Enbridge Gas, CMHC, NRCan and OEB.

Program Name	Target Market	Administrator	Descriptions
Energy Affordability Program	Income qualified households	IESO	Two types of support available based on different qualification: free energy-efficiency expert home visit, or free energy-saving kits with easy-to-install products
Peak Perks	Households with certain types of smart thermostats	IESO	Brief, time-limited thermostat adjustments during periods of peak electricity demand occur on the hottest summer days. **$75** virtual prepaid Mastercard® when rolled and **$20** virtual prepaid Mastercard® each year of enrollment
Smart Thermostats	Detached, semi-detached, row townhouses	Enbridge	$100 instant discount for selected types of smart thermostat
Home Winterproofing Program	Income qualified households	Enbridge	Provide free home assessment, insulation, draft proofing and smart thermostat carried out by trusted delivery agent and qualified contractors
Home Efficiency Rebate Plus	Enbridge gas customers, homeowners	Enbridge (Funding through the Canada Greener Home Grant)	Home energy assessment with a registered energy advisor is required. Provide rebates towards eligible retrofits including: - Home insulation - Air sealing - Windows and doors - Space and water heating - Smart thermostats - Solar panels

Program Name	Target Market	Administrator	Descriptions
			- Weatherproofing
Canada Greener Homes Loan	Single family homeowners with good credit history	Natural Resources Canada	10 year, interest-free loan for amount of $5,000 - $40,000 based on eligible retrofit products and installations selected
Oil to Heat Pump Affordability Program	Oil-heated income qualified households	Natural Resources Canada	Up to $10,000 for the purchase and installation of eligible cold climate air source heat pump systems, and any of the associated eligible measures
OEB Bill Assistance Programs	Income qualified households	Ontario Energy Board	Ontario Electricity Support Program (OESP) provides an ongoing monthly credit directly on qualified consumers' electricity bills. Low-income Energy Assistance Program (LEAP) provides a one-time grant towards electricity or natural gas bill for emergency situations
CMHC Eco Plus	Properties awarded an eligible certificate	CMHC	The home must meet the eligible building standards and/or the EnerGuide and EnerGuide GJ ratings. A 25% partial premium refund if you're CMHC insured and buying or building an energy efficient home

RBC Energy Saver Loan which provides 1% off the loan interest rate or a $100 rebate on a home energy audit on a fixed rate instalment loan over $5,000 when purchasing eligible environmentally friendly products or services. CIBC and TD also provide personal loan for general home renovations.

Comparison and Integration

With NEER community finance program, many existing programs can be integrated and leveraged to support Newmarket residents.

Income-qualified households could benefit from various programs and receive both financial support and free energy efficient products. Single family homeowners can also participate in various one-time

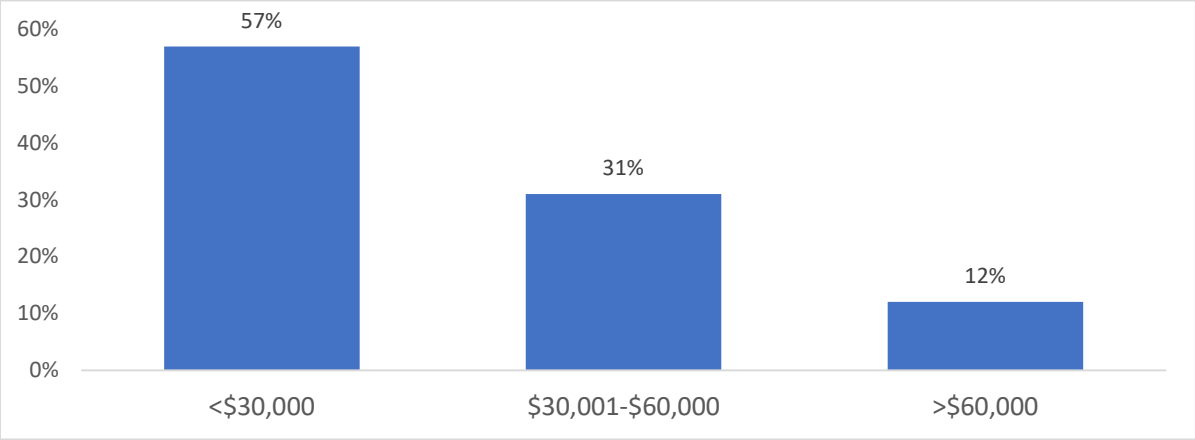
rebate or discount programs for certain energy efficient measures. These kinds of programs will lower the burden for households to participate in financing programs like NEER as it acts as an umbrella program.

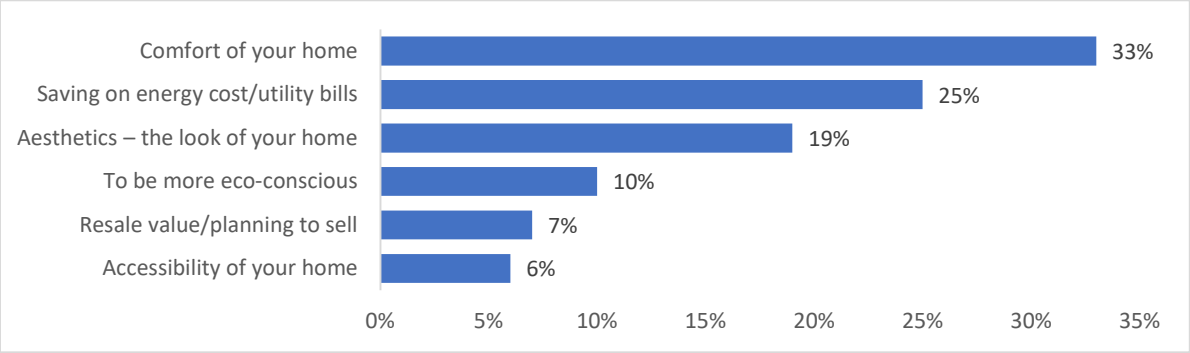
Compared with the federal loan program, NEER is more user friendly and is designed specifically for Newmarket residents. In addition, NEER aims to smooth out the participation process with providing Concierge 2.0 services, which will provide a one stop shop for homeowners' energy education, project scoping and selection of certified contractors.

Appendix E: Newmarket Customer Feedback

A survey was conducted among residents of the Town of Newmarket to assess opportunities for homeowners to improve the efficiency of their homes. One part of the survey was a phone survey, which used a mix of cell and landline phone numbers in the region. Numbers were dialed randomly by live interviewers. The phone survey ran from December 19th to December 28th, 2022 and received 104 responses. Responses were screened based on postal code to ensure that respondents reside within the Town of Newmarket. This resulted in 100 valid completes. The other part of the survey was the online survey, which was publicly available on Newmarket's municipal website. The online survey ran from beginning of 2023 to March 17, 2023. In total, there were 140 valid completes. Thus, in total, there were 240 Newmarket households that took the survey.

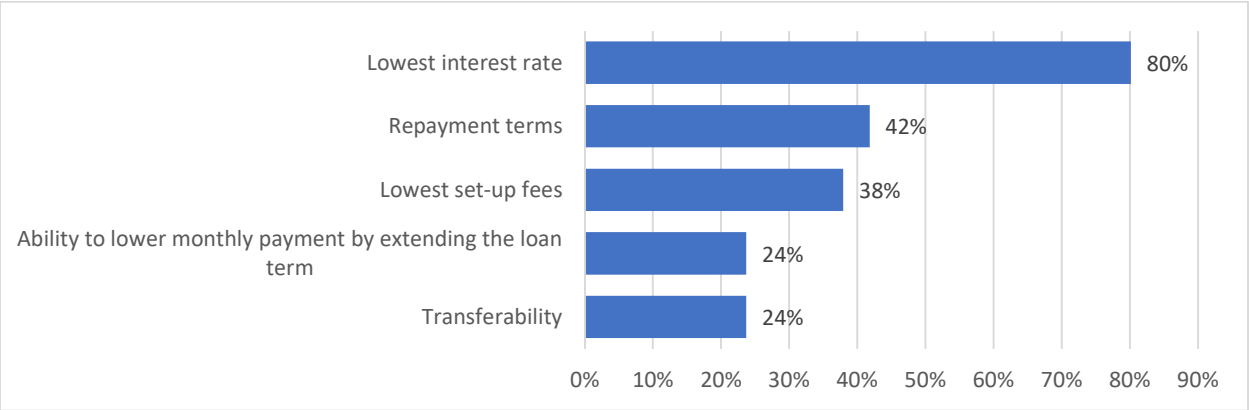
For renovation inventions, 41% are considering a home renovation and most of them (97%) would consider energy improvements during the home renovation. The top three renovation intentions are bathroom upgrades, kitchen upgrades and minor (painting and aesthetics). The preferred renovation budget and reasons of renovation are shown below:





83% would value the Town of Newmarket pre-qualifying contractors for quality workmanship, safety, and competitiveness. The top three contractor characteristics the Newmarket residents are looking for are quality of workmanship, good reputation and competitive price. 65% would appreciate some advisory-type service and within these respondents, 20% are willing to pay for it and 62% would pay if the cost is reasonable.

For financing options, 58% prefer not to borrow. This makes Concierge 2.0 a better option for those who does not want to be indebted to the program. 23% prefer using an existing lender (bank, mortgage company, or line of credit) for financing and 20% prefer a municipal property assessment that stays with home (water heater rental contract). The exhibit below shows the preferred financing options for the respondents.



Appendix F: Meeting Summary

Date	Type	Highlights
March 29, 2022	Kick-off Meeting/ Steering Committee Meeting #1	Initiated Business Plan development. Enerva presented methodology, deliverables and work plan
April 14, 2022	Core Team Updates #1	Reviewed date request, stakeholder engagement expectations and other segments of the business plan
April 28, 2022	Core Team Workshop #1	Provided summary of prior work, updates on data sets and principles
May 11, 2022	Core Team Updates #2	Discussed updates of data sets, contractor network, consumer decisions and operating models
May 16, 2022	Council Meeting	Introduced Enerva, NEER-BP and project process to council
May 18, 2022	Meet with Garforth Team	Discussed the Business Case assumptions and findings
May 30, 2022	Core Team Workshop #2	Reviewed previous modelling and discussed operating and financing models
June 2, 2022	Meeting with HVAC Contractor – Nancy McKerghan	Discussed Contractor's thoughts about NEER
July 7, 2022	Meeting with Finance Specialist – Thor Jensen	Discussed LIC options
July 13, 2022	Core Team Check-In	Provided project updates
July 18, 2022	Steering Committee Meeting #2	Presentation by guest speakers (Nancy McKeraghan, Martin Luymes, Thor Jensen)
September 19, 2022	Core Team Updates #3	Discussed contractor network, consumer decision and operating models
October 14, 2022	Steering Committee Meeting #3	Discussed operating models. Legal considerations, source of capital and project updates
November 3, 2022	Meet with Garforth Team	Discussed operating model, measure bundling, marketing strategies
November 3, 2022	NEER Legal Discussion with Ron Clark of Aird Berlis	Prepared legal memo
November 9, 2022	Mayor & CAO Briefing	Reviewed options for ownership and operating models, overview of legal analysis scope, sources and uses of funds, and project status.
December 7, 2022	Core Team Updates #4	Discussed primary market research including phone survey, population stratification and retrofit cost
December 14, 2022	Media and Mailout Campaign for NEER survey	Discussed postcard, mailout area, webpage and social media
February 14, 2023	Core Team Updates 5	Discussed CEF program, survey results and legal assessment

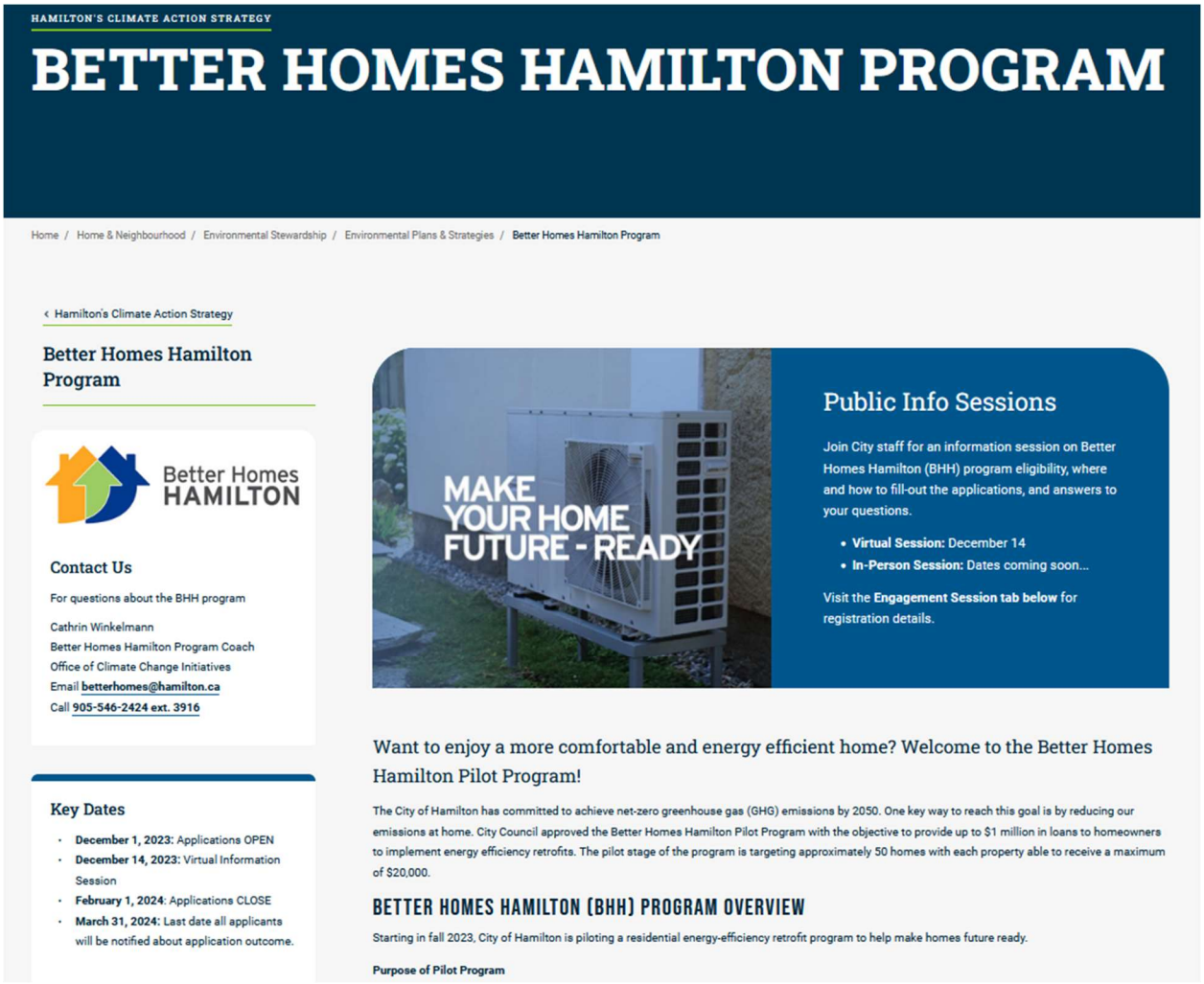
April 6, 2023	Steering Committee Meeting #4/ Meet with Mayor	Discussed legal assessment updates, survey results (both phone/online), CEF and other program updates, and NEWCO innovation
May 8, 2023	Council Meeting	Presented work completed to date, and other items from Steering Committee Meeting #4
May 17, 2023	Meet with local resident Walter	Discussed some feasibilities of energy efficient measures
June 21, 2023	Core Team Check in	Provided project updates
July 20, 2023	Steering Committee Meeting #5	Reviewed scope of work, key decision points for Business Pland and new principles-based approach
August 10, 2023	Core Team Check in	Prepared memo for steering committee and prepared for Mayor meeting
August 14, 2023	NEER-BP Project Updates with Mayor	Discussed three approaches: traditional approach, MSC+Concierge 2.0, and awareness campaign
September 11, 2023	Council Meeting	Demonstrated three approaches to the council members and Core Team helped with questions
October 2, 2023	Core Team Check in	Provided project updates
November 27, 2023	NEER-BP Draft Page Turn	Reviewed the draft Business Plan
December 29, 2023	Meet with local resident Walter	

Appendix G: Programs in other municipalities

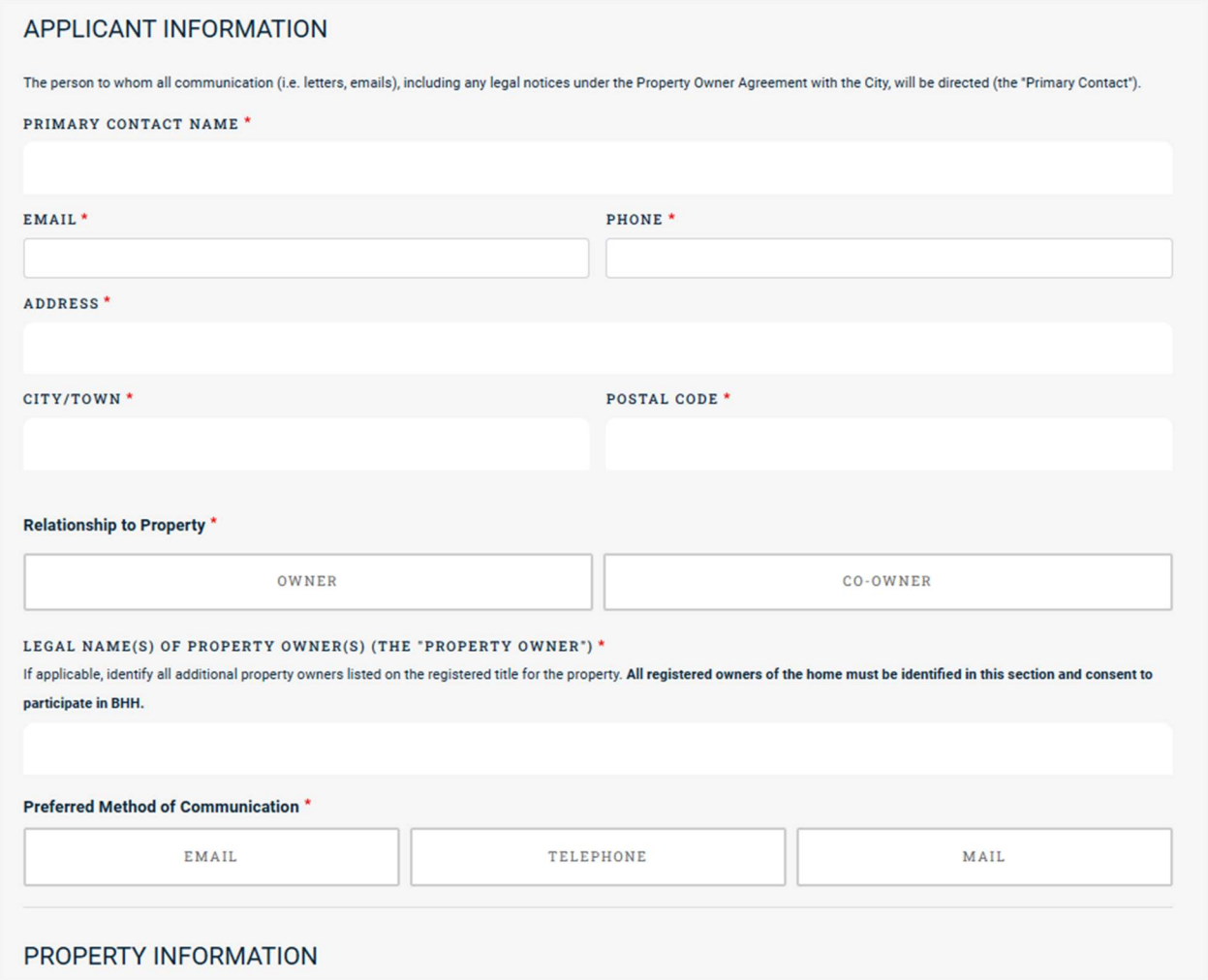
Better Homes Hamilton Program:

- Newest program launched in Ontario, applications open on December 1, 2023
- A pilot study for future program development and 50 homes of varieties of characteristics will be selected for participation
- The program is carried by Office of Climate Change Initiatives and it provides coach services
- The maximum loan per applicant is $20,000 and it is 0 interest rate with 10-15 year of repayment, collecting via property tax bill
- Eligible measures include building envelop, mechanical systems for heating and cooling, supporting infrastructure, and permitting and assessments. Air source heat pump is considered as the majority of spending of the loan
- The loan is stackable with existing government and utility incentive programs, including income-qualifying incentive programs
- The program does not provide a list of approved contractors but the coach will verify the contractor with provided quote.
- The applicant may receive 30% of the total loan to pre-pay the contractors. However, the applicant needs to use their own money to pay all contractors, then submit report and paid invoices to get the loan.

Website:



Application Portal:



APPLICANT INFORMATION

The person to whom all communication (i.e. letters, emails), including any legal notices under the Property Owner Agreement with the City, will be directed (the "Primary Contact").

PRIMARY CONTACT NAME *

EMAIL * PHONE *

ADDRESS *

CITY/TOWN * POSTAL CODE *

Relationship to Property *

OWNER CO-OWNER

LEGAL NAME(S) OF PROPERTY OWNER(S) (THE "PROPERTY OWNER") *

If applicable, identify all additional property owners listed on the registered title for the property. **All registered owners of the home must be identified in this section and consent to participate in BHH.**

Preferred Method of Communication *

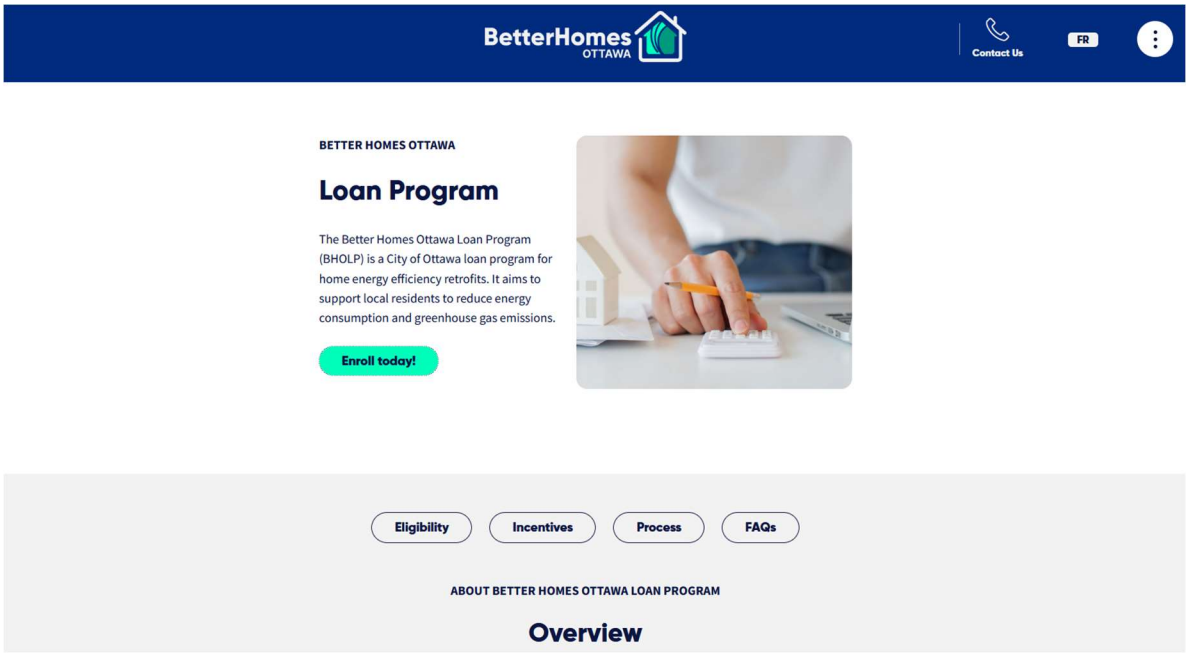
EMAIL TELEPHONE MAIL

PROPERTY INFORMATION

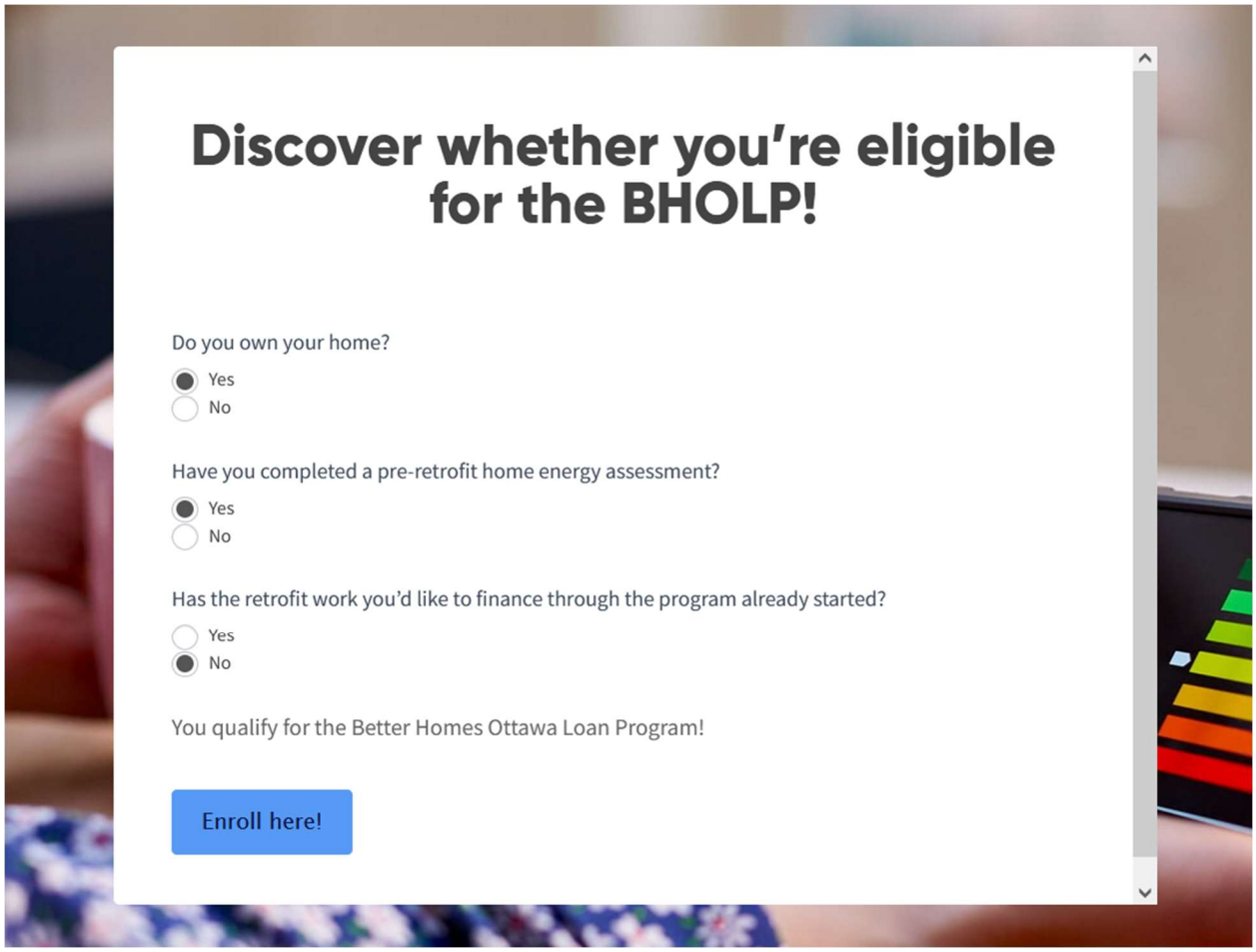
Better Homes Ottawa

- The maximum loan is $125,000 (or 10 percent of the current value assessment of the home, whichever is less) and it is 4.33% interest rate with 20 year of repayment, collecting via property tax bill. There is also an administrative charge for 4% of total loan value.
- Eligible measures include thermal envelope upgrades, mechanical systems, renewable energy, EV chargers (Level 2), and the addition of rental suites (up to a maximum of 30% of the value of the loan).
- The BHOLP was launched in November 2021 with a total of $8 million in zero-interest loans and $4 million in low-interest loans (3.25% interest) – these funds are being disbursed to the first round of applicants.
- On June 30, 2022, the City of Ottawa recapitalized the Better Homes Ottawa Loan Program by securing a $15 million loan agreement with VanCity Community Investment Bank. This will allow an estimated 500 residents of Ottawa to participate, which is the current program available.
- The income-qualified households may get 0% interest loan.

Website:



Portal:


Discover whether you're eligible for the BHOLP!
Do you own your home?
Yes
No
Have you completed a pre-retrofit home energy assessment?
Yes
No
Has the retrofit work you'd like to finance through the program already started?
Yes
No
You qualify for the Better Homes Ottawa Loan Program!
Enroll here!

English (US)

Application

Better Homes Ottawa - Loan Program

All fields marked with * are required and must be filled.

Welcome to the City of Ottawa's Better Homes Ottawa - Loan Program (BHOLP) (the "Program"). The purpose of the Application is to determine eligibility for BHOLP funding to undertake energy efficiency, water conservation, and renewable energy works to your property. Please complete the following form and submit it to the City. A homeowner will have 12 months from the date the City issues Notice To Proceed to complete their retrofit project. Extensions may be granted for valid reasons and provided the Program is continuing. Further instruction on how to submit this application is found below.

Additional information about BHOLP can be found by visiting betterhomesottawa.ca.

Any questions you may have can be directed to the Better Homes Ottawa Program Manager by e-mailing betterhomes@envirocentre.ca or by calling 1-877-580-2582.

What's Next?

Upon receipt of your completed Application, the Program Manager will review your form to determine your property's eligibility based on the following:

- Property type, location and verification of property ownership
- Status of your property tax and utility bill payments
- Debt service ratio assessment.

After completion of the review, if you meet Program eligibility requirements, the Program Manager will provide you with a Notice to Proceed letter that identifies:

	Home Energy Loan Program (Toronto)	Better Homes Kingston	Durham Greener Homes	Better Homes Ottawa	Better Homes Hamilton
Financing (% home value or $)	10% or 125,000	10% or 40,000	40,000	10% or 125,000	20,000
Interest rate	Fixed 3.5- 4.32	0	Variable 2-3.5	0-4.33	0
Terms (years)	5-20	20	3-10	20	20
Administration/ application fees	2%	n/a	n/a	4%	n/a
Early payoff options	Yes	Yes	n/a	Yes, lump sum	n/a
Mortgage lender approval	Yes	Yes	n/a	n/a	Yes
Home energy audit	Yes	Yes	Yes	Yes	Yes
Contractor payor	Homeowner	Homeowner	Homeowner	Homeowner	Homeowner
Prequalified contractor	No	Energy coach help find qualified	Energy coach help find qualified	No	Energy coach help find qualified
Administrator type	Municipality	Municipality	Credit Union	Municipality	Municipality
Repayment Option	Property tax bill	Property tax bill	Monthly	Property tax bill	Property tax bill
Energy coach	Yes	Yes	Yes	Yes	Yes