



A STUDY TO EXPLORE THE FEASIBILITY OF A SOCIAL PURPOSE ORGANIZATION TO ADVANCE DEEP ENERGY RETROFITS IN HALTON

Funded by the



COMMUNITY
FOUNDATIONS
OF CANADA



Report written by

KENNEDY
CONSULTING

May 2021

FINAL

Table of Contents

Executive Summary	iii
Acknowledgements	vi
Acronyms.....	vi
1. Overview.....	1
Objective	1
Focus and Location	3
Participants.....	4
Process.....	5
2. Findings.....	5
Market and Baseline Conditions in Halton	6
Opportunities	18
Challenges	21
3. Service Options.....	23
4. Assessment for HEN	25
5. Feasibility for HEN	26
Social Business Model Canvas	29
6. Conclusions.....	30
Appendix A: Additional Context	i
Appendix B: Interview Questions and Interviewee List.....	vi
List of Interviewees	vi
Interview Questions	vi
Appendix C: Potential Areas to Target for Deep Retrofit Programs.....	iii
Appendix D: References	vi

Executive Summary

<p>What is this study all about?</p>	<p>This study was conceptualized by the Halton Environmental Network (HEN). HEN is a for-impact non-profit interested in supporting best practices for climate change mitigation, adaptation, and environmental sustainability.</p> <p>This study explores ways that organizations in Halton, including HEN, can help Halton homeowners make their homes more energy efficient by advancing deep home energy retrofits via a social purpose organization (whose mission supports the creation of profit <i>and</i> community benefits).</p> <p>This study is part of Phase I of the Investment Readiness Program (IRP). At the ‘Early-Stage Innovation’ phase, this study focused on exploring the above-mentioned idea through research and community engagement and provided the opportunity to document the lessons learned for further advancement in the IRP program and to share the lessons learned with other stakeholders.</p>
<p>What is a deep retrofit and why is it important?</p>	<p>Deep energy retrofits mean actively replacing or upgrading residential features to save 50% or more of a home’s energy costs. Some deep retrofits achieve net-zero energy use, with the homes producing as much energy as they use from on-site renewable resources, such as solar power.</p> <p>These upgrades are often significant and require a whole-home, systems thinking approach for dramatically reducing energy use and can be done all at once or it can be a multi-stage process that unfolds over time. Examples of deep retrofits from the recent federal announcement include:</p> <ul style="list-style-type: none"> • Upgrade of entire heating and cooling systems, replacing oil furnaces or low-efficiency systems with a high-efficient furnace, air source heat pump, or geothermal heat pump; duct-system redesign, thermostat replacement and installation of on-demand water heaters. • Significant building-envelope upgrades, wall, or basement insulation and/or wall or roof panels. • Reconfiguring the interior and adding or rearranging windows for increased daylight • Installing a high-efficiency water heater or on-site renewable energy like solar panels. • Replacing drafty windows, doors, and skylights. (Government of Canada, 2021) <p>The current industry practice of single-measure or shallow retrofits, focuses on isolated system upgrades (e.g., HVAC, windows, etc.). These retrofits are less intrusive, are generally simple and less costly, but they often miss the opportunity for saving more energy cost-effectively.</p>

<p>Why did HEN look at this?</p>	<p>We are in a climate crisis. We know that in Halton, as per a study conducted by the Atmospheric Fund, 50% of GHG emissions comes from buildings and to achieve our greenhouse gas (GHG) mitigation targets, we need to upgrade (or retrofit) over 80% of our existing housing stock (by replacing older windows, and roofs, better insulation, and upgraded heating and cooling systems.) to a achieve a net zero or near zero emissions target.</p> <p>HEN is interested in supporting best practices to combat climate change. Home energy upgrades are one important way to reduce local greenhouse gas emissions. HEN wanted to explore different ways to catalyse more of this behaviour in Halton alongside its partners and allies, which include municipalities, utilities, realtors, insurance, and private companies.</p> <p>HEN is hopeful that the contextual confirmation included in this report can be used by many of its partners in Halton, and beyond, as planning for large-scale deep energy retrofit deployment proceeds in Canada.</p>
<p>Who was involved?</p>	<p>HEN interviewed municipalities, electricity and gas providers, private companies that make, sell, and install products and services for homes in Halton - including the Towns of Halton Hills, Milton and Oakville and the City of Burlington - surveyed over 400 homeowners, met with realtors, and connected with organizations advancing deep home energy retrofits across Canada.</p>
<p>How was this funded?</p>	<p>Funding was provided by the federal Investment Readiness Program (IRP) via the Oakville Community Foundation. The Investment Readiness Program has five stages of development. This study falls into Phase 1 “Early-Stage Innovation” in the investment readiness continuum.</p> <ul style="list-style-type: none"> • Early-Stage Innovation: Exploration and ideation of the initiative - aligning a proposed solution to an identified need. • Strategic Impact Focus: Feasibility analysis and community support development. • Impact Sustainability: Business model development, use of data for planning & impact measurement, diversification of funding sources. • Financial Resilience: Revenue generation, legal structure (incl. debt & equity), ability to scale and replicate. • Investor Ready: Sustainable cash flow and assets, track record for sustainability and networking with prospective investors.
<p>What did you find?</p>	<p>The results of the feasibility study demonstrated the following:</p> <p>(1) There are many opportunities associated with advancing deep energy retrofits via a social purpose organization (including an ever-expanding market and the recent</p>

federal announcement for a residential retrofit program to induce market demand), alongside a number of challenges (including a lack of consumer awareness about why and how to advance residential deep energy retrofits, availability of retrofit and loan programs, and uncertainty about the readiness of the trades that would be facilitating these retrofits).

- (2) There are important roles for private and public organizations and new market entrants – other than HEN – to advance deep energy retrofits, including via a social purpose organization. If other entities in Halton wish to establish (or partner to create) a social purpose organization focused on providing one or more elements related to advancing retrofits via installation and/or financing, HEN is open to exploring capacity building, partnerships, and/or strategic support.
- (3) There is a crucial role for local non-governmental organizations (NGOs) like HEN in advancing deep energy retrofits. The emerging market conditions indicate that Halton homeowners are seeking assistance and HEN is interested in supporting them by providing:
 - Trusted and clear information for homeowners about the pathway to successful residential retrofits;
 - Assistance to navigate the retrofit process and how to apply for rebates or financing (via an information portal or an "energy agent");
 - A convening role for its partners to help coordinate a rapid and fulsome response;
 - By amplifying the work of other partners /actors to ensure consistent messaging for homeowners, and data capturing to collect information on the best methods to replicate in other communities; and/or
 - Collaborating to create a hub for sharing information, case studies and lessons learned.

Understanding that the policy imperative, financing tools, technology, supplies, and installers are at various stages of market readiness, HEN is committed to exploring partnerships to help homeowners navigate this complex system. HEN is committed to partnering to develop and share simple consumer pathways to meaningful, deep energy retrofit actions.

HEN is open to pursuing further exploration of the establishment of a social purpose organization and convening its partners to establish a trusted network of support.

Acknowledgements

This study was conceived and commissioned by the [Halton Environmental Network](#), based in Oakville, Ontario, Canada.

HEN gratefully acknowledges that this study was funded by the Investment Readiness Program (IRP) via the Oakville Community Foundation.

This study was completed by Kennedy Consulting in collaboration with researchers from the University of Waterloo, Dr. Sarah Burch and Dr. Jeffrey Wilson, and Wild & Co.

HEN gratefully acknowledges the contributions of community partners including the members of the Halton Climate Collective, interviewees, survey respondents, webinar attendees, and mentor, Wayne Miranda, of the McConnell Foundation.

Acronyms

CEF	Community Efficiency Financing
EA	Energy Advisor
FCM	Federation of Canadian Municipalities
GHG	Greenhouse gas
HEN	Halton Environmental Network
LIC	Local Improvement Charges
NGO	Non-government organization
SDG	Sustainable development goal

1. Overview

Objective

WHY WAS THIS STUDY COMPLETED?

We are in a climate crisis and in Halton, each municipality has declared a climate emergency – Burlington, Halton Hills, Milton, Oakville, and the Regional Municipality of Halton. We know that buildings in Halton represented more than half of the community’s energy use and 50% of its greenhouse gas (GHGs) emissions that directly contribute to climate change. To achieve locally established mitigation targets, over 80% of the existing housing stock needs to be retrofitted in Halton by 2041 (Oakville Energy Strategy, 2020).

The Halton Environmental Network (HEN), a local for-impact and not-for-profit agency, is interested in supporting best practices for climate change mitigation, adaptation, and environmental sustainability. HEN, like many other leading organizations around the world, believes that deep energy retrofits, versus the current industry practice of single-measure or shallow retrofits, could help reduce our local GHG emissions by targeting the existing building stock.

What is HEN’s mandate? Halton Environmental Network (HEN) strives to make the community of Halton a region with educated citizens, engaged stakeholders and best practice policies for climate change mitigation and adaptation, and environmental sustainability.

This study was one method to explore how HEN - and/or its partners and allies - could catalyse the rapid scaling and installation of deep energy retrofits in Halton.

This feasibility study asks the question: Could the establishment of a social purpose organization (the preferred delivery model) to implement deep energy retrofits: (1) quickly accelerate the transition to, and increase uptake of, deep energy retrofits by local homeowners in Halton, and thereby reduce our local GHG emissions; (2) be profitable; and (3) achieve other social and environmental benefits.

What is a social purpose organization? “... [A]n organization whose mission combines revenue growth and profit-making with the need to respect and support its environment and stakeholder network. This includes listening to, investing in, and actively managing the trends that are shaping today's world.” (Deloitte, April 2019)

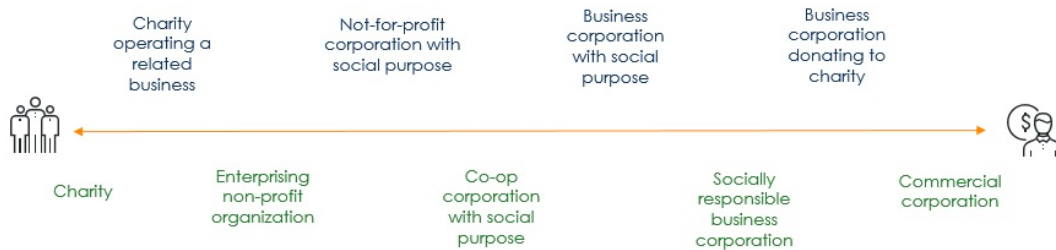
Prepared for:



Developed by:



SPECTRUM OF SOCIAL ENTERPRISES IN CANADA



Source: Government of Canada, 2019

WHAT POSITIVE IMPACT COULD THE PROJECT HAVE?

Advancing the installation of deep energy retrofits has multiple co-benefits, including:

- Improved indoor air quality
- Reduced energy costs
- Provide local governments with an opportunity to tackle GHG emissions
- Improved health and reduced healthcare costs
- Generating jobs
- Addressing energy poverty
- Increasing the productivity and educational attainment of urban residents
- Reduced maintenance costs
- Increased home values
- Increasing resilience to climate change impacts

(Sources: C40, 2021; Government of Canada 2020)


Advancing deep energy retrofits is directly related to the United Nations Sustainable Development Goal (SDG 8) Decent Work and Economic Growth, SDG 9 Industry Innovation, specifically Target 9.4, which states:

By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities. (United Nations, 2021).



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Prepared for:  HALTON ENVIRONMENTAL NETWORK

Developed by:  KENNEDY CONSULTING



Advancing deep retrofits also advances SDG 11 Sustainable Cities and Communities, and SDG 13 Climate Action.

Additional opportunities associated with rapidly scaling up the installation of deep energy retrofits via the involvement of a social purpose organization are included in Section 2.

WHAT IS A DEEP ENERGY RETROFIT?

Deep retrofits can be costly due to the extent of the work required, however a study conducted for the City of Ottawa showed that the higher cost and even longer payback period yielded the highest energy savings compared to shallow and moderate retrofits. **Deep retrofits provide the better long-term solution to help meet mitigation targets across the communities in Halton.**

Note: All estimates in this section are extracted from the [Pathway Study on Existing Residential Buildings in Ottawa](#), 2019.

Shallow retrofits are often lower cost, simple upgrades such as replacing inefficient lighting, upgrading to higher efficient appliances, and installing smart thermostats. For a detached home, the average cost could be ~\$5,000. The estimated energy savings, however, is between 10 – 20%.

Moderate retrofits can include those listed under the shallow retrofits, with the addition of insulation upgrades, upgrade, or furnace replacement, for example. The average cost can be anywhere from \$5,000 - \$50,000 for a detached house and the energy savings is estimated to be in the 30 – 50% range.


Deep retrofits, on the other hand focuses on a whole home, systems approach that targets all aspects of heat loss in the home and often requires structural upgrades. For a detached home, estimates place deep retrofits at over \$100,000 and can include significant building-envelope upgrades, wall, or basement insulation and/or wall or roof panels, window and door upgrades, changes to the home heating system etc. The result is large and lasting energy and emissions reductions between 40 – 80% and has on average a ~6 + year payback.

Focus and Location

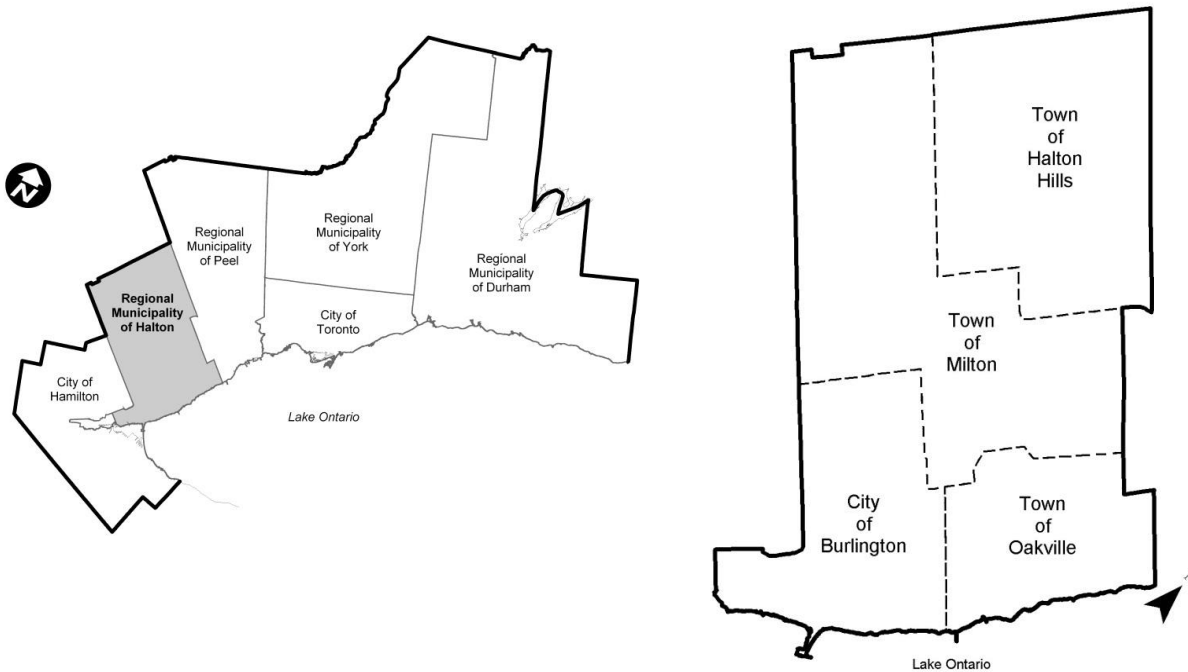
WHERE WAS THIS STUDY COMPLETED?

This study focused on the possibility of retrofitting semi-detached homes, townhomes, and detached residences in a community in southern Ontario, Canada, called Halton. Halton is comprised of four local area municipalities: The City of Burlington, Town of Oakville, Town of Halton Hills, and Town of Milton (Map 1).

Prepared for:  HALTON ENVIRONMENTAL NETWORK

Developed by:  KENNEDY CONSULTING





Map 1. Map of the Region of Halton showing its location in the Greater Toronto and Hamilton Area and an inset map with the four local municipalities (Source: Region of Halton’s Official Plan)

Participants

WHO WAS INVOLVED IN THIS STUDY?

This study reached across - and beyond - Halton and involved several participants, including:

Participant	Role
Halton Environmental Network	To oversee the process To coordinate community outreach To liaise with the community
Consulting Team	To conduct background research To support the engagement process To provide feasibility analysis
Realtors, energy, and deep energy retrofit service and technology providers in Halton and surrounding area	To share insights on the deep energy retrofit market and consumer readiness

Local and regional municipalities, utilities, and hydro companies	To share their ongoing work on accelerating deep energy retrofits in community To share their sense of the regulatory, policy, and systemic challenges and opportunities associated with deep energy retrofits
Homeowners in Halton	To share insights on their awareness of, and opportunities and challenges with, deep energy retrofits

Process

HOW WAS THIS STUDY UNDERTAKEN?

This feasibility study involved the following steps between September 2020 and April 2021:

- **Background research** about what is happening in Halton, across Canada, and around the world.
 - Research conducted is available in Appendix A
- **Community conversations** to socialize and frame the study, including the geographic boundaries.
- A **webinar** with local realtors to understand the market for deep energy retrofits.
- A series of sixteen ten-minute **interviews** with residents across Halton to understand their awareness of deep energy retrofits, including the language they use to describe them.
- A series of over fifteen **in-depth interviews** with a wide range of stakeholders from Halton and beyond.
 - The questions asked, and list of interviewees is included in Appendix B
- An **online survey** with 400 respondents to understand the pulse of the community, including opportunities and barriers to action on deep energy retrofits.

2. Findings

WHAT DID WE LEARN?

The research and engagement process for this study revealed a number of key findings, including insights about:

- Market and baseline conditions in Halton;
- Potential opportunities associated with advancing deep energy retrofits in Halton; and
- Perceived challenges associated with advancing deep energy retrofits via a social purpose organization in Halton.

HEN is hopeful that the contextual information included in this report can be used by many of its partners in Halton, and beyond, as planning for large-scale deep energy retrofit deployment proceeds in Canada.

Market and Baseline Conditions in Halton

TARGET MARKET AND HOUSING PROFILE

The Oakville Energy Strategy, 2020, states that, “nationally, the built environment is the third largest emitting sector, and most of today’s homes and commercial and institutional buildings will still be in operation in 30 years. Consequently, this sector has been identified a priority for action by the federal, provincial, and territorial governments. Retrofitting existing homes and buildings and ensuring new construction is delivered to the highest energy standards will be essential to achieving this strategy.”

“However, on average, existing homes and buildings in Oakville are approximately half as efficient as global benchmarks, underscoring the opportunity to increase the energy performance of the residential sector while reducing emissions and costs.”

That said, not all homes in Halton can be targeted for retrofitting in the short term. When designing a retrofit strategy or roll-out for Halton, some targeting of the market will be necessary, and likely a phased approach based on areas of highest priority and/or easiest access.

As per the 2016 Canadian Census, the population of Halton Region was 548,435, and there were 192,305 private dwellings (Statistics Canada, 2017). Figure 1 provides a breakdown of the housing stock by age of dwelling.

The Energy Conservation Progress Report (2019) found that 85% of Ontario homes built in or before the year 2005 use at least 2 times as much energy as those built in 2019. Based on research by the Canada Green Building Council (2016), deep energy retrofits should be prioritized in buildings that are built before 1980. The Halton Region has:

- over 74,000 dwellings built in 1980 or before
- 52,000 dwellings built in 1981 and 2000

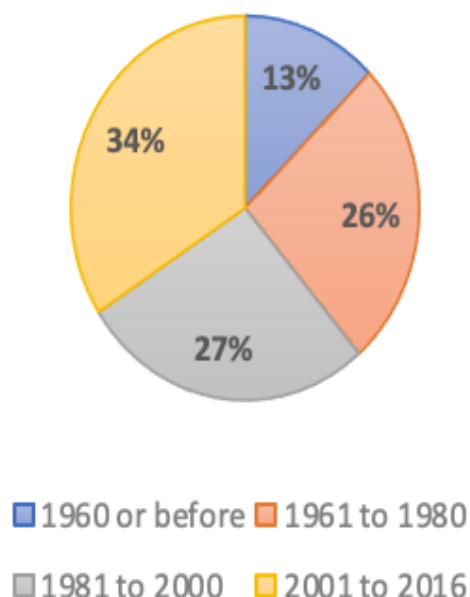
Prepared for:



Developed by:

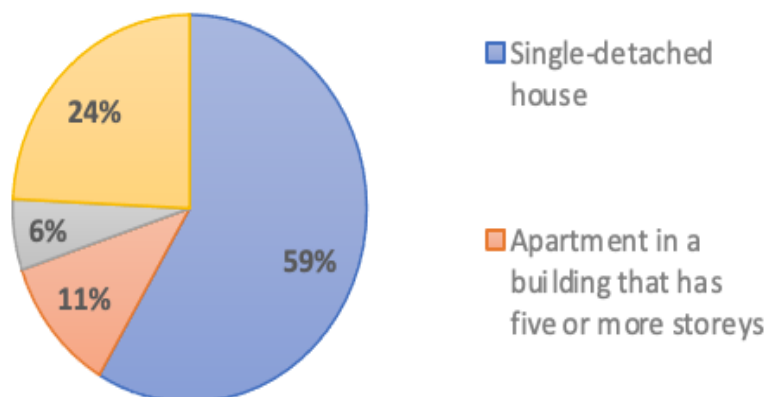


Figure 1. Housing stock by year built, Halton Region



Within Halton, 113,000 dwellings are single detached houses representing 59% of the housing stock. An additional 24% of dwellings are row houses, semi-detached houses, or duplexes (Figure 2). Single detached homes consume more energy than other dwelling types even when analyzed on a per capita basis (Norman et al., 2006). Owners of single detached homes are more likely to engage in efficiency programs as they have full autonomy over the building envelope and heating source (Wade, 2021).

Figure 2. Type of housing stock, Halton Region



An analysis completed on the energy efficiency trends in Canada from 1990 to 2013 found that home efficiency has greatly increased during this time frame, largely attributed to more efficient water heaters and furnaces (NRCAN, 2013).

Based on this review of the literature, the ideal target audience for deep home energy retrofits in Halton are:

- Owners of single family, detached homes;
- Homes built pre-1981 and/or 1981-2000; and
- Those with a household income in the top quintile.

Maps 2 to 5 offer insight into the potential areas to target for deep retrofit programs, and are highlighted in Appendix C.

Halton residents who are seniors, low-income or energy-poor, may not be part of this target audience based on their household income, yet they still have a role to play in helping communities across Halton achieve their emission reduction targets. Programming for these communities will need to take on a different form.

[SaveOnEnergy](#) offers the Energy Affordability Program which provides support to income-eligible electricity consumers in Ontario to help lower their energy bills and create comfort in their homes. Some participants receive a kit with energy saving products or an energy audit followed by free upgrades. [Enbridge Gas](#) also has an income qualifying weatherization program and [Canada Mortgage and Housing Corporation](#) is currently piloting a Affordable Home Energy Retrofit Toolkit with the City of Toronto that could be replicable in the future.

These programs, coupled with new federal rebates, local municipal rebates, and financing opportunities, will assist this segment of residents to decrease emissions, energy consumption and costs, and improve the comfort, safety, and climate resilience of their homes. HEN's vision of a social purpose organization could also support these residents with navigating the available rebates, financing, and free upgrades that are available to make it a seamless experience and increase participation. Additional engagement and research are recommended to further these concepts.

AVAILABILITY OF PRODUCTS AND TRAINED RESOURCES

To understand the current state of products, services, and related information available to homeowners in Halton, the team conducted web-based research and phone outreach to current providers. The goal was to better understand the existing market - including if services were available to homeowners, at what price point, and if information was easily accessible to laypeople.

Web research involved simple Google searches from a Burlington IP using terms including home energy retrofit program, energy improvements Halton, home energy reduction, lower energy bills Halton, home energy audit (Ontario, Burlington, Halton) and home energy improvements Burlington. Top unpaid search results were reviewed, with a focus on:

- Local news and media sources that provided recent coverage on programs or policies (example: local coverage possible or emerging programs in Halton Hills and Burlington).
- Information on service providers (those service providers who appeared at top of search rankings, excluding platforms like HomeStars).

Through this web-based research, the team identified and reached out to five service providers including one non-profit network. Four contacts were made (by phone, email) with service providers who offer services to residential clients in Halton - including one additional Toronto-based service provider known to the research team. Efforts represent a very small and convenience-based sample, but we do believe represent a realistic experience for a non-expert homeowner seeking to navigate options around home energy savings.

Based on the activity above, the team's key findings include:

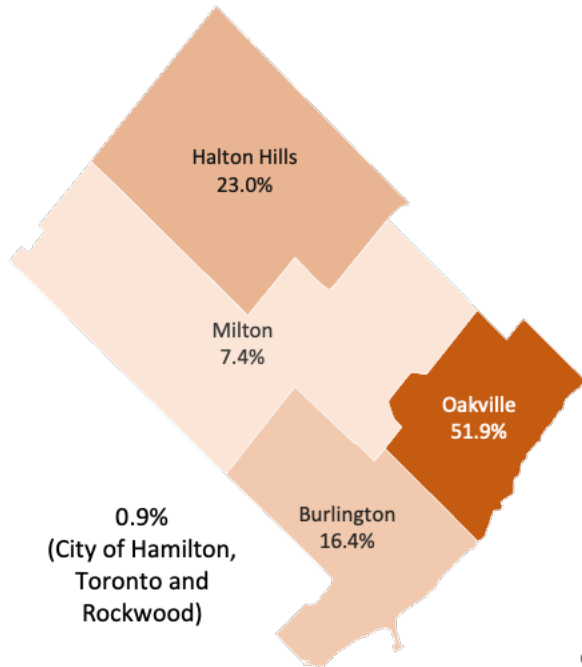
- **Service provider supply:** There are enough service providers who can do home energy audits for Halton homeowners.
 - Within one short research session, the team identified at least 3 credible service providers who covered the region. All provided EnerGuide audit services on their websites with reference to rebates available.
 - The market rate for a two-visit (pre- and post- renovation) energy audit appears to be about \$400 + \$200, respectively, plus HST.
- **Access to information on energy conservation or retrofit programs:** Web-based information on energy conservation or retrofit programs is unclear and incomplete. For instance, information on municipal-level energy strategies and pilot programs in some communities (such as Halton Hills and Burlington, as above) is available through media reports but appears to be at early planning or design stage. It is unclear to homeowners what these initiatives might look like, who may be eligible or when services might be rolled out.
- **Access to information on rebate programs:** Information on rebates is likewise piecemeal and difficult to navigate. However, information provided by energy audit companies regarding cost of energy audits and potential rebates for home upgrades was clear and consistent. However, key information was not provided:
 - The estimated up-front cost of any energy-saving measures, before rebate.
 - A list of eligible measures and their associated rebates.
 - The potential energy or cost savings associated with any upgrades.
 - The opportunity for bonus' or layering of available rebates.

- The details of an anticipated federal rebate program that could bring significant new opportunities, such as what it would cover, and the timing.
- **Role limitations within the energy retrofit system:** There are very clear limitations on what roles some actors can play within the energy retrofit system.
 - Energy Advisors (EAs) are not to recommend contractors or other service providers. That is understood as a ‘conflict of interest’ - though firms providing energy audits did suggest they could support a homeowner in conducting their research.
 - One energy audit provider noted that the limitation of EA support beyond their obligation to make recommendations based on the results of the audit, means some homeowners, (those without access to a Green Architect or sustainable builder, for example) will have to find solutions to action the recommendations on their own. This would require a search for a designer/architect as well as builder or contractor who can action the energy efficient upgrade recommendations. Its at this stage that the homeowner could benefit from someone like an energy coach who they could go to for guidance and advice.

MARKET ASSESSMENT

In February 2021, HEN distributed a link to an online home energy survey on social media and via its newsletter, seeking responses from owners and residents of detached, semi-detached and townhomes in Halton.

400 people completed the online survey which was comprised of 10 questions. Of the responses, 97% were homeowners - of which 5% shared decision making with condo boards or similar groups. Map 6 shows the physical distribution of respondents across Halton.

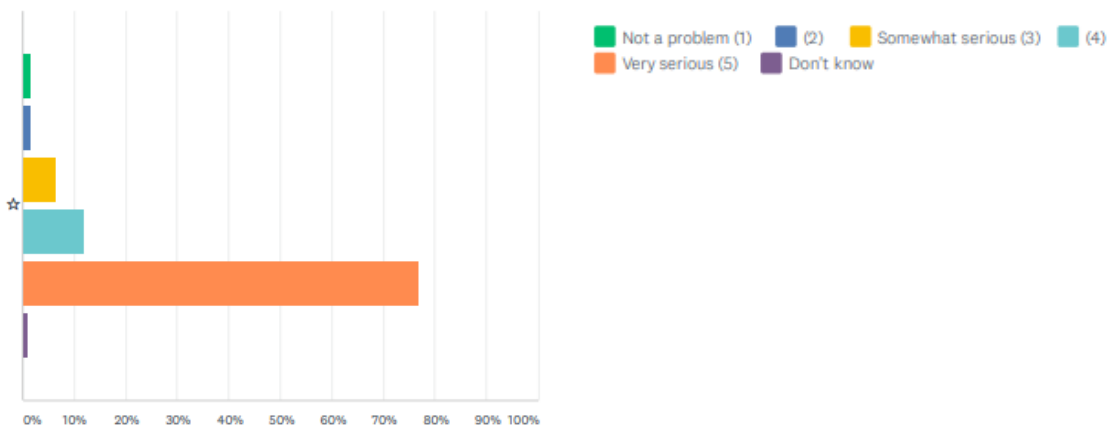


Map 6. Physical distribution, by local area municipality, of survey respondents.

Key findings of the online home energy survey:

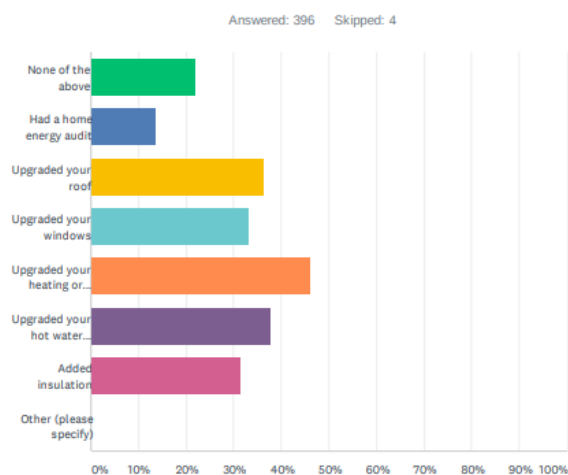
- **Respondents take climate change seriously and are willing to take personal action.**
 - Over 95% of respondents thought climate change was a somewhat serious to very serious problem.
 - Nearly 80% chose the most serious option available on a scale of 1 - 5 - a “very serious” problem. (Figure 3)
 - 97% of respondents said that to help address climate change, their family has or would be willing to consider some personal lifestyle changes.

Figure 3: Respondent’s rating of the severity of climate change (n = 400)



- Respondents reported being motivated by a range of important considerations.**
 - When asked about reasons behind their decisions on energy-saving renovations or upgrades, they rated the importance of a list of different factors. The most popular responses were “doing my part against climate change by reducing greenhouse gases” and “saving money on energy bills” (76% of participants rated these 4/5 or 5/5 on the importance scale).
 - Low up-front cost was less important to people than knowing that the investment would pay back in 5-10 years although both were still at least somewhat important to respondents.
- Respondents are very concerned about being taken advantage of by a business or contractor when making energy-saving renovations or upgrades.**
 - 98% of respondents said this was “somewhat to very important to them”.
 - More than 72% said it was “very important” - ahead of concerns about the process being non-disruptive, aligning with other renovations, resulting in a more comfortable home, or drawing on someone else's positive experience.
- In the last 5 years, approximately 13% of respondents had completed a home energy audit.** (Figure 4)
 - This is a relatively low number when compared to the proportion of people who reported major upgrades in the last 5 years, including:
 - 46% upgraded a heating or cooling system
 - 37% upgraded a hot water heater
 - 36% upgraded a roof
 - 33% upgraded windows
 - 31% added insulation

Figure 4: Respondent’s rating of what upgrades they completed in the last five years



- **When asked where they would look if they wanted a home energy audit, respondents chose a wide range of different actors.**
 - An environmental group was the most frequent option (37%), followed by my local municipality (34%), local hydro company (27%) and local energy company (25%)
 - Only 6% indicated they did not think they would ever be interested in a home energy audit, though many had already done so.

MARKET DEMAND

Research on retrofits indicates that there is interest from homeowners to undertake retrofits for multiple reasons:

- Improve the comfort of their home
- Replace older equipment
- Be more efficient (save energy & resources)
- Reduce energy bills
- Improve indoor air quality
- Increase / preserve home value
- Shared values with neighbours

Over the course of the study, we also heard and learned homeowners do not undertake retrofits for the following reasons:

- Uncertain what to do and in what order
 - As one interviewee said, “It’s a lot of work to figure it all out unless there is an organization putting all of these pieces together to make it happen. It’s too hard for individuals to put this together on their own.”
- There is a lot of coordination involved/takes too much time
 - Another interviewee stated that they, personally, tried to undertake a home retrofit process and found it arduous: “Knowing what to do and how to do it, getting skilled contractors, etc. was the hardest part, even as a highly-motivated person who understands the energy sector and the value of retrofitting.”
- Spiralling renovation costs
- Confusion about how to qualify for rebate programs and what measures qualify
- Unknown costs and uncertainty about relative value/payback periods
- Lack of time to meet with contractors – to make decisions and supervise renovations
- Lack of trust in quality and cost of contractors’ work
- Disruption/mess at home

FINANCIAL INCENTIVES

In terms of inducing market demand, government actors in Canada are working to reduce the financial barriers for homeowners through the following initiatives:

- On April 19th, 2021, the federal government announced a “\$4.4 billion plan to retrofit residential buildings to make them more energy efficient.” The money will flow through the Canada Mortgage and Housing Corporation (CMHC) and will take the form of interest-free loans of up to \$40,000 for projects like replacing oil furnaces with higher-efficiency furnaces, installing better wall insulation, adding solar panels or replacing drafty windows and doors. The government estimates more than 200,000 households could take advantage of that program”. (CBC, 2021).
- Locally, all municipalities in Halton are exploring (or in the implementation stages) of establishing on-bill financing as a mechanism to help homeowners fund their retrofits via Local Improvement Charges (LICs). The Federation of Canadian Municipalities (FCM) has an [active funding program](#) – the Community Efficiency Financing (CEF) initiative to help municipalities explore local financing programs:
 - **Burlington:** “The City of Burlington is working with the Centre for Climate Change Management at Mohawk College to develop a home energy retrofit program which will include developing a business plan for a delivery centre, assessing financing options for homeowners, and providing information sessions for homeowners.” ([City of Burlington](#))
 - **Halton Hills:** Through the CEF initiative supported by the FCM, the Town of Halton Hills was awarded \$300,800 for Retrofit Halton Hills pilot program in March 2021. This will provide homeowners with access to LIC financing mechanisms. (The Toronto Star online, March 3, 2021)
 - **Milton:** As stated in the Town of Milton’s Community Energy Plan (2018), the objective is to implement residential retrofits with a target of yielding 35% efficiency. This includes delivering standard retrofit packages aligned with financing with an aim of 50% homes to be retrofitted by 2030 ([2018 Community Energy Plan](#))
 - **Oakville:** Oakville has a target to achieve a 30% residential sector efficiency gain by retrofitting 80% of existing homes, and increased efficiency of new homes by 17% Ontario Building Code efficiency gain by 2041 ([Community Energy Strategy](#))

Prepared for:



Developed by:



What is Local Improvement Charges financing?

Extracted directly from the City of Vaughan's website:

The Local Improvement Charges regulation is an existing tool available under the *Municipal Act 2001*

This financing mechanism is known as Property Assessed Clean Energy (PACE) financing in the US and has been in place since 2008. PACE legislation is now in almost 40 states in the US and has enabled residential retrofits for over 200,000 households and leveraged over \$5 billion in energy improvements.

The LIC regulation is a type of property-assessed financing mechanism. The main benefit to the building owner of LIC financing is that repayment of the financing by the building owner is added to the property tax account and 'runs with the land'. If the property is sold, the new owner continues the LIC payment. From the municipal government perspective, the payment obligation attaches to the benefitting property, not the owner, and is secured by statutory priority lien. Property owners also have the option of repaying the LIC in full.

Other Financing Options

LICs are one type of loan-based financing. When it comes to deep home energy retrofits, other models also exist:

- **Loan financing:** loans from financing institutions, utility companies (repayment on monthly bills), and municipal government, property assessed clean energy (PACE) loans – low rate and long term, repaid as an assessment on the property tax bill and tied to the property not the person undertaking the renovations
- **Bulk pricing:** Local governments secure reduced prices for equipment or retrofit packages (bids are made and a winner is chosen) which increases trust in the suppliers
- **Leasing:** This is available with some technologies like heat pumps
- **Pay for performance model:** This model shifts away from upfront costs to a model of ongoing payments based on verified energy savings

CONSUMER PATHWAY

From a consumer perspective, one of the reasons deep home energy retrofits are complex to navigate is because of the sheer volume of information to understand, navigate, process, and decide upon. The following chart illustrates the stages of decision-making along a simplified spectrum:

Figure 5. A simplified spectrum of homeowner involvement and decision-making for residential home energy retrofits

	Unaware	Interested	Uncertain	Ready	Decision-making			Proceeding
Homeowner Stage	I have heard about this, but I don't know too much	I am interested in learning more about retrofits!	I am concerned about the cost	I am interested in proceeding with a retrofit, but I don't know where to turn	I want to choose what retrofits are best for my house	I want to hire competent people	I don't have time to manage this	I am ready to go
Market Need	Education and information sharing	Clear, trusted information about what's available	Options to offset the upfront costs	Clear information	Clear options	Trained, skilled and trusted installers	An energy concierge to manage the process	Trained and skilled installers
Tools/ Resources/ Services	Web-based or via an energy advisor	Web-based or via an energy advisor	Rebates, incentives and/or financing options	Web-based or via an advisor	Web-based or via an advisor	Tool to connect homeowners to contractors	Neutral service to help navigate the system	Trained and available installers

Understanding the need to accommodate the consumer for the best outcome in their retrofit journey, there are organizations already starting to offer services and piloting approaches to maximize participation and retrofit benefits. The two examples below demonstrate collaborative approaches that aim to be a one-stop shop for homeowners to access resources for all their home retrofit needs.

1. [BetterHomesTO](#)

BetterHomesTO is an online resource for Toronto residents to help them make their homes more energy-efficient and climate-friendly.

Partners include the City of Toronto, Natural Resources Canada, Enbridge, Toronto Hydro, BILD GTA, Canadian Home Builders' Association, Clean Air Partnership, Ecobee, Humber College, School of Social Entrepreneurs, The Roots Collaborative, University of Toronto, and the Windfall Ecology Centre.

Resources offered include:

- Information regarding planning for a renovation including how to hire a contractor, EnerGuide Home Evaluations and upgrades
- Information regarding home improvements that can be made, including costs, things to look for and types of technologies
- Information on net zero homes
- Available programs, incentives, and rebates
- Financing options

2. [Bring it Home for Climate – pilot program](#)

In partnership with the Capital Regional District, the City of Victoria, the Township of Esquimalt, the District of Saanich, and the District of Central Saanich, City Green (a not-for-profit organization turned social enterprise) has developed and administered the Bring It Home 4 the Climate program to provide support and education to homeowners in the capital region looking to make their homes more climate friendly.

The program provides free expert advice through the innovative, and COVID-19 safe, Virtual Home Energy Check-Up, educational workshops, EnerGuide subsidies, and efficiency resources to participants, and empowers them to motivate others in their community to improve their homes as well.

This program was developed with funding support from the Federation of Canadian Municipalities' Transition 2050 Grant program.

Resources offered include:

- Free virtual home energy check-up
- Free energy coach service
- Free events and workshops
- EnerGuide evaluation subsidy and access to other rebates
- Resource library
- Testimonials

A few more examples of these types of efforts from local and international resources are listed in Appendix A: Additional Context.

Opportunities

POTENTIAL OPPORTUNITIES ASSOCIATED WITH ADVANCING DEEP ENERGY RETROFITS IN HALTON

Opportunities associated with advancing deep energy retrofits in Halton via a social purpose organization include...	
<p>Focusing on necessary actions, in partnership</p>	<p>All local municipalities in Halton have declared climate emergencies. Deep energy retrofits are one of the key tools to help rapidly implement municipal community energy plans in the residential market to drive down energy use and emissions.</p> <p>Development of a social purpose organization could serve to rapidly advance municipal climate action, in partnership with the stakeholders mentioned in Executive Summary. As one interviewee said, “[the climate] crisis requires many actors. This does not necessarily mean competing actors, but actors who can play their best roles accordingly.”</p>
<p>Targeting a prime market for maximum impact</p>	<p>As illustrated in the previous section and Appendix C, Halton’s housing stock is a prime candidate for deep energy retrofits. Based on dwelling age, 126,000 homes in Halton Region would be suitable for deep energy retrofits. Seventy-four thousand of those were built in 1980 or before making them high priority homes for energy efficiency improvements. Refer to maps 2 and 3 in Appendix C for a breakdown of the region by age of dwelling.</p>

Creating jobs	<p>Research indicates that deep energy retrofits are connected to job creation for skilled workers and tradespeople.</p> <p>In addition, on the supply-side, there are opportunities to develop a national supply chain for high-efficiency home renovation products with local connections.</p>
Shining a light on co-benefits, including re-training	<p>Given the economic fallout associated with the COVID-19 pandemic, including major work-related disruptions affecting entire sectors, skills-focused retraining and employment programs are of particular interest.</p> <p>Well-designed interventions have the potential to generate both positive environmental, climate and social/economic impacts.</p>
Sharing knowledge to help homeowners	<p>We learned that information for homeowners is partial - and policies, technology and market realities are evolving rapidly. Few very well-informed, well-networked actors exist - among technical specialists, contractors, and the public. While breakthroughs in technology, policy innovations and cost-saving options exist, it can be hard to access and make sense of a complete picture of home energy retrofits. This is true at homeowner level (what makes sense for me and my family?) and among environmentally focused policy actors (how best to design incentives and programs that work at scale?).</p> <p>The creation of a social purpose organization could bridge this knowledge gap and create necessary connections. As one interviewee said: Homeowners “struggle with fragmented programs from electricity, gas, municipalities. Homeowners find it confusing - having a trusted local source to help wade through the information and help them decide what is best for them.”</p>
Bundling services	<p>As stated above, the world of retrofits is complex – especially for homeowners! One option, that has been adopted with success in Europe, is to bundle retrofit options into simple, replicable packages. Having only two or three options helps to streamline</p>

	<p>service offerings and reduce confusion for consumers and helps contractors become more efficient by being able to replicate their work.</p>
<p>Bundling services continued</p>	<p>Bundling can involve:</p> <ul style="list-style-type: none"> • Tiered standard packages - like New York City’s EnergyFIT or Fort Collins’ Efficiency Works – where providers offer pre-set combinations of retrofit measures to participating homes that have a similar building typology (i.e., low or medium income, townhomes, etc.) • Aggregated retrofit demand – like Energiesprong in the Netherlands – where providers make use of high level of demand to bulk purchase retrofit components at a lower price. Program targets standardized building typology of social housing market as a way of aggregating demand. • Building retrofit passport – as in Germany, Belgium, France, and Denmark – are longer term processes that take homeowners through a process of retrofits over time. An on-site energy audit, building renovation passport is provided that shows step-by-step renovations required to provide deep energy reductions.
<p>Building on a foundation of trust</p>	<p>A core theme in homeowner interviews and surveys involved trust - in particular, a deep wish to avoid being taken advantage of by technical specialists or contractors. Survey responses and interviews with third-party actors at municipal level suggested that HEN is considered trusted and credible, as an actor interested in climate action.</p>
<p>Accelerating the uptake of emerging financing models</p>	<p>The community needs a good understanding of the problem (i.e., carbon contribution by existing home stock), potential solutions, methods/process to acquire retrofit services, financial supports (LIC offering), other financing tools, provincial and federal supports to meaningfully address the stated emergency.</p>
<p>Getting in before the market gets too crowded</p>	<p>The market for deep home energy retrofits in Halton (and across Canada) is nascent and there is room for growth.</p>
<p>Focusing on our reality to accelerate change</p>	<p>Now, with Halton residents at home due to COVID-19, comfort is top of mind. We know, via the research conducted, that home comfort, is one of the top drivers for decisions to increase home energy efficiency, not the desire to reduce energy costs. Energy</p>

	<p>prices are currently not high enough in Canada to make big upfront spends on efficiency all that enticing, even with low-interest loans.</p>
<p>Focusing on our reality to accelerate change (continued)</p>	<p>As energy prices increase, that will make for a better case to renovate to decrease energy costs.</p> <p>One interviewee noted, energy prices could rise, and planning now could help homeowners offset future costs: “Many homeowners are very unaware of the future cost increase exposure related to the \$170/tonne carbon tax by 2030. This has a material impact of annual heating costs (up to \$2k/yr. for a larger 4-bedroom home), which people need to begin planning for as soon as possible.”</p> <p>And finally, with the recent federal budget containing \$4.4 billion in residential retrofit funding flowing through the Canadian Mortgage and Housing Corporation (see additional context in Appendix A), the market is primed for action. The funding will provide interest-free loans worth up to \$40,000 for those who undertake retrofits identified through an authorized EnerGuide energy assessment.</p>
<p>Embedding equity considerations</p>	<p>Deep energy retrofits are often implemented by homeowners with high incomes and disposable assets. Establishing a social purpose organization could create an opportunity to target revenue generation from high income earners and redirect profits to installation of deep energy retrofits in homes with low-income earners and/or help create equitable access to funding/loans and/or create free resources.</p>

Challenges

POTENTIAL CHALLENGES ASSOCIATED WITH ADVANCING DEEP ENERGY RETROFITS IN HALTON

Potential challenges associated with advancing deep energy retrofits in Halton via a social purpose organization include...

<p>Confusing landscape for consumers</p>	<p>From a consumer perspective, as illustrated above, there are many choices to be made, no simple or clear pathways to action, and multiple points to depart a somewhat long decision-making process. It is certainly not an Amazon Prime “one click and ship” experience.</p>
<p>Lack of broad organizational alignment</p>	<p>Retrofitting is part of a complex institutional system of actors. There are multiple players (municipalities, local distribution companies, researchers, non-governmental organizations, for profit companies, etc.) that touch the residential home efficiency market, that are operating independently. A number of institutional interviewees termed this challenge as a “failure of imagination to organize (or coordinate) action on a large scale.”</p> <p>Another interviewee commented that action on deep home retrofits “will require a concerted effort and need a lot of coordination of financing, contractors, etc. - who don’t often work together - will require a big, concerted effort and an organization that can pull together all of the necessary players.”</p>
<p>Retrofits are largely invisible</p>	<p>Except for windows, doors and some solar panels, deep energy retrofits are largely invisible to other people besides a homeowner. As one real estate agent shared, “What people can see, sells. Think about a new countertop or Wolfe range. People aren’t asking about heat pumps.”</p> <p>Another interview noted that homeowners may be “drawn to new technology – rather than windows/doors/insulation – and may be more intrigued by things like battery storage, etc.”</p> <p>The lack of visibility presents a challenge in terms of perceived homeowner value and lack of ability for social pressure to exert influence on purchasing decisions.</p>
<p>Risk of shallow, not deep, retrofits</p>	<p>To make a meaningful change, residential retrofits need to be deep. There is a risk that advancing retrofits, especially in an uncoordinated way, could lead to “one-off” or shallow retrofits.</p>
<p>Navigating the boom/bust cycle of support</p>	<p>Presently, the federal government has committed funding to allow for homeowner loans to finance retrofits. Without deep government-based incentives, other researchers have concluded that such a social purpose organization would not be feasible</p>

<p>Lack of consumer awareness</p>	<p>Generally, there is not widespread knowledge about how much homes are contributing to the climate crisis nor an understanding of the benefits of, or need for, undertaking a residential deep energy retrofit. Inducing demand, even with federal incentives, will continue to be a challenge.</p>
<p>Liability and risks with “doing the work”</p>	<p>Deep home energy retrofits touch homes – there are liability and risk considerations with certain aspects of the retrofit cycle – especially related to installation.</p> <p>Note: HEN has stated it is not interested in action related to installation or entering competition with local installers or auditors</p>

3. Service Options

Based on what we heard through the process about the needs of the homeowners, these are the (non-mutually exclusive) general service options that could be undertaken in Halton to advance the uptake of deep energy retrofits. These options are meant to represent the range of activities for a variety of private, public, and non-governmental actors to take – in isolation, competition, or via partnership – to achieve municipal energy targets for the residential market.

<p>Outreach/Education</p>	<p>To support broader climate action on the part of other actors/to lend their brand and credibility in support of initiatives that result in positive climate action, including education and information sharing.</p> <p>To provide workshops for homeowners on topics such as: what is entailed in a home evaluation, what are air source heat pumps (or any other technology), net-zero homes or how to choose a contractor.</p> <p>To provide information sessions for stakeholders (auditors, contractors, realtors) on what HEN is communicating to homeowners and the services that are being provided to help align stakeholders on the best way to guide homeowners through the deep retrofit process.</p>
---------------------------	--

<p>Concierge/ Energy Advisor</p>	<p>To provide a customized service to guide homeowners through the process of planning for, financing, and installing deep energy retrofits. This could involve providing advice on what is recommended, developing a plan, providing a list of qualified energy auditors and contractors, identifying available rebates, etc.</p>
<p>Convening and Collaborating</p>	<p>To act in a coordination (or secretariat) role to convene key institutional partners in Halton to coordinate a rapid response.</p> <p>To facilitate the creation of partnerships that will foster a collaborative and unified approach to servicing Halton residents through their deep retrofit journey.</p>
<p>Networking</p>	<p>To act as a third-party information provider (or provide network infrastructure such as an online tool) to bring together homeowners, financiers, and installers.</p>
<p>Financing</p>	<p>To provide information regarding financing or loans to homeowners for retrofits</p>
<p>Installation</p>	<p>To engage in an aspect of deep energy retrofit installations - for example, conducting audits, training installers, or verifying completed work</p>
<p>Pilot Energy Mapping</p>	<p>Create a web platform for residents who have had an EnerGuide evaluation to share their home’s energy rating to help people to prioritize the efficiency of the home when they are making a home purchasing decision. This is currently being practiced in the City of Edmonton and is a mandatory part of their Home Energy Retrofit Accelerator program.</p>
<p>Establishing and managing a contractor network</p>	<p>Create a contractor network to ensure these essential program partners are renovating for the best outcome, not to just replace something that needs to be fixed. Qualifying contractors would simply verify that they have a business license and proper insurance and would participate in training to understand the goals of retrofitting to a net zero or near net</p>

	zero target and help communicate similar messaging as HEN to residents looking to make energy efficient upgrades in their homes.
--	--

For deep energy retrofits to be successful in Halton, all these activities need to be undertaken. Given the findings in Section 2, it is reasonable to assume that with a burgeoning market, financial support from municipalities, and expanded federal support, a social purpose organization focused on one (or more) of these aspects, could be profitable.

As other organizations move through their retrofit journey - HEN is open to partnership and collaboration to ensure that all these buckets are propelled quickly and efficiently to maximize our community impact, with a distinct focus on the spectrum of consumer decision-making.

4. Assessment for HEN

To allow HEN to assess its possible role in the market, these broad service-based options have been weighed against the following criteria:

- Alignment with HEN’s strategic mandate
- Internal capacity
- Co-benefits (magnitude and scale of impact, including equity)
- Existing market actors / gaps (serving a need)
- Identified risks
- Potential for a consistent funding/revenue stream

	Aligns with HEN's Mandate	Internal Capacity is Present	Co-benefits Exist	Able to Overcome Market Barriers	Identified Risks can be Reduced	Possible Funding/ Revenue Streams
Outreach/Education	XXX	XXX	XXX	XXX	XXX	XX
Concierge/ Energy Advisor	XX	X	XXX	X	XX	XX
Convening and Collaborating	XXX	XXX	XXX	-	-	X
Networking	XX	XX	XXX	XX	XX	XX
Financing	-	-	XX	-	-	-

Installation	-	-	XX	-	-	-
Pilot Energy Mapping	XXX	X	XXX	XX	XX	XX
Contractor Network	XXX	X	XXX	X	XX	XXX

Rating Scale: XXX High XX Medium X Low - Not Applicable

Based on the findings indicated in Section 2, 3 and 4 of this report, HEN believes there is a crucial role for it, as a local non-governmental organization, to work with its partners to advance deep home energy retrofits in Halton.

HEN is interested in proceeding to the second phase along the investment readiness continuum, “Strategic Impact Focus,” and ultimately to assess the financial feasibility of a social purpose organization (refer to Sections 5 and 6) focused on providing:

- Trusted and clear information for homeowners about the pathway to successful residential retrofits;
- Assistance to navigate the retrofit process and how to apply for rebates or financing (via an “energy agent”); and
- A convening role for its partners to help coordinate a rapid response.

5. Feasibility for HEN

IS THE CREATION OF A NEW SOCIAL PURPOSE ORGANIZATION TO ADVANCE DEEP ENERGY RETROFITS FEASIBLE FOR HEN?

As noted in Section 4, HEN is interested in proceeding through the investment readiness continuum to explore the feasibility of developing a social purpose organization that would address how fragmented the retrofit space is and create the alignment and collaborative partnerships needed to advance deep home energy retrofits.

The following factors and assumptions underpin the subsequent analysis:

- The recently announced federal funding will accelerate market demand;
- Municipal support, from all four local municipalities and the Region, to meaningfully advance their climate emergency declarations with concerted efforts on deep home energy retrofits, including possible funding for partnerships;
- There is a sufficient number of retrofit installers in Halton, and the private market will continue to accelerate this if market demand exceeds local supply; and
- There is good availability of retrofit products (heat pumps, windows, etc.) that are ready to be installed.

HEN is interested to focus on activities that align directly with its mandate, help to rapidly scale-up deep energy retrofits in Halton, and focus on the needs of the consumer. These proposed activities are highlighted in green as an addition to the table previously presented in Section 2:

Figure 6. Possible roles for HEN as part of a social purpose organization to advance deep energy retrofits

	Unaware	Interested	Uncertain	Ready	Decision-making			Proceeding
Homeowner Stage	I've heard about this, but I don't know too much	I am interested in learning more about retrofits!	I am concerned about the cost	I am interested in proceeding with a retrofit, but I don't know where to turn	I want to choose what retrofits are best for my house	I want to hire competent people	I don't have time to manage this	I am ready to go
Market Need	Education and information sharing	Clear, trusted information about what's available	Options to offset the upfront costs	Clear information	Clear options	Trained, skilled and trusted installers	An energy concierge to manage the process	Trained and skilled installers
Tools/ Resources/ Services	Web-based or via an advisor	Web-based or via an advisor	Rebates, incentives and/or financing	Web-based or via an advisor	Web-based or via an advisor	Tool to connect homeowners to contractors	Neutral service to help navigate the system	Trained and available installers
Possible Role for HEN: Education and Information Sharing	Partner to create a Halton-centric, web-based resource to share clear information about: <ul style="list-style-type: none"> • What is a deep retrofit? What are the benefits? • Pathways to retrofits, including bundles • Costs/case studies 							N/A
Possible Role for HEN: Networking and Connecting	Partner to create a Halton-centric "energy agent" service to help homeowners navigate the retrofit space by answering questions and guiding homeowners through the process, including applying to rebates and financing							N/A
Possible Role for HEN: Convening	Work "behind the scenes" to convene partners in Halton to quickly develop a cohesive approach for consumers							N/A

Social Business Model Canvas

A social business model canvas (below, based on the template from the Social Enterprise Institute) was used to assess the overall feasibility of HEN moving into this space:

<p>MISSION To work in partnership to provide trusted and clear information to homeowners focused on the pathway to successful residential deep energy retrofits in Halton</p>				
IMPLEMENTATION		VALUE	MARKET	
<p>Key Allies Local and regional municipalities Local realtors Local suppliers Local installers Other ENGOs (for future scaling)</p>	<p>Key Resources HEN's existing network and connections</p>	<p>Social Innovation Create a community collectively motivated to help meet 2030 reduction targets.</p>	<p>Customer Relationships Use HEN's reputational capital as a trusted partner to bridge relationships and create local connections</p>	<p>Channels New website for homeowners Amplification via social media and HEN's distribution lists</p>
	<p>Key Activities Partner to create a Halton-centric, web-based resource to share clear information about retrofits Partner to create a Halton-centric "energy agent" service Work "behind the scenes" to convene partners in Halton (See above for more details)</p>	<p>Value Proposition Increase the viable market for installers (bring them customers) Promote prioritizing energy efficiency for installers (echo language used for customers) Connect homeowners with municipal funding (increase uptake of LICs) Reduce local GHG emissions</p>	<p>Consumer Benefits Reduce the pain points for consumers by creating simple options and "holding their hands" Help reduce decision-making fatigue Meet people where they are in the process Create a better understanding of the innovative products available for homeowners to adopt</p>	

6. Conclusions

This feasibility study allowed HEN to research, interview, survey, and engage with the community to gather learnings and insights to help explore the idea of a social purpose organization being the solution required to help homeowners pursue deep retrofits to help meet the energy and emissions reduction targets of communities in Halton.


As an outcome of the exploration phase of the investment readiness continuum, we have discovered that establishing a social purpose organization, with the assumptions stated in Section 5, could possibly generate social value (measurable impact), environmental value (reduction in GHGs) and potential economic value (profitability/sustaining revenue).

Understanding that the policy imperative, financing tools, technology, supplies, and installers are all at various stages of readiness, HEN is committed to focusing on helping homeowners.

HEN is committed to exploring partnerships to develop and share simple consumer pathways to meaningful, deep energy efficient action and to helping Halton residents to navigate the complex choices that they need to make.

HEN has the ability to build on its expertise in communicating with and engaging the community by clearly sharing a pathway to deep home energy retrofits. As one interviewee stated: in a situation with “fragmented programs from electricity, gas, municipalities. Homeowners find it confusing - having a trusted local source to help wade through the information and help them decide what is best for them” would be helpful.

Prepared for:  HALTON ENVIRONMENTAL NETWORK

Developed by:  **KENNEDY**
CONSULTING



COMMUNITY FOUNDATIONS OF CANADA



Appendix A: Additional Context

WHAT DID WE LEARN?

Federal Context

Federal Budget Announcement – April 19, 2021

Lower Home Energy Bills Through Interest-free Loans for Retrofits

Climate action starts at home, and deep home energy retrofits can have a big effect on emissions reduction. Whether people replace drafty windows, improve insulation to keep homes warm in winter and cool in summer, or install heat pumps, deep retrofits will help Canadians make their homes more energy efficient and can also help to better protect their homes from climate risks.

Examples of deep retrofits to make our homes greener:

- Replacing oil furnaces or low-efficiency systems with a high efficiency furnace, air source heat pump, or geothermal heat pump.
- Better wall or basement insulation and/or wall or roof panels.
- Installing a high-efficiency water heater or on-site renewable energy like solar panels.
- Replacing drafty windows and doors.

These retrofits also make our homes more comfortable, reduce our energy bills, and create good middle-class jobs, especially for skilled workers and tradespeople. Furthermore, it can also help spur clean growth by developing an industry for energy efficient retrofits, including the development of a Canadian supply chain for high-efficiency home renovation products.

The 2020 Fall Economic Statement put forward a program to provide Canadians with one million free energy audits and up to 700,000 grants, valued at up to \$5,000, to complete energy efficient home improvements. To help homeowners and build on these measures:

Budget 2021 proposes to provide \$4.4 billion on a cash basis (\$778.7 million on an accrual basis over five years, starting in 2021-22, with \$414.1 million in future years) to the Canada Mortgage and Housing Corporation (CMHC) to help homeowners complete deep home retrofits through interest-free loans worth up to \$40,000. Loans would be available to homeowners and landlords who undertake retrofits identified through an authorized EnerGuide energy assessment. In combination with available grants announced in the Fall Economic Statement, this would help eligible participants make deeper, more costly retrofits that have the biggest impact in reducing a home's environmental footprint and energy bills. This program will also include a dedicated stream of funding to support low-income homeowners and rental

Prepared for:



Developed by:



properties serving low-income renters including cooperatives and not-for-profit owned housing.

The program would be available by summer 2021. It would be easily accessible through straightforward online tools and is expected to help build Canadian supply chains for energy efficient products. It is estimated that more than 200,000 households would take advantage of this opportunity.

International Context

Two international examples that used bundling as an approach to energy retrofits are outlined below, adapted from [Building Energy and Retrofits Bundling Programs](#).

The Netherland's Energiesprong: Aggregated Retrofit Demand

A successful program has been implemented in the Netherlands which uses high demand to bulk retrofit purchases. The target market was social housing that allowed for bulking together standardized building types.

Through this program, companies bid on providing retrofit packages including:

- Envelope upgrades i.e., insulated wall/roof panels that include windows and doors; and
- Internal upgrades, such as efficient lighting and high efficiency appliances as part of kitchens and bathrooms.

Financing of upgrades was through energy cost savings and reduced maintenance and repair costs.

Europe: Building Retrofit Passport

Countries across Europe including Germany, Belgium, France, and Denmark, have used a longer-term approach for home energy retrofits. First an on-site energy audit is done, followed by a building renovation passport to demonstrate the steps providing deep energy reductions.

This approach was used to ensure retrofits were installed in the best way possible to eliminate potential rework. The long-term energy and emissions target in the majority of cases is 2050. The benefits of this long-term approach have led to completion of more upgrades per household.

A similar approach is being taken by Transition town UK, a grassroots-based movement providing participants with a workbook of carbon and energy savings strategies ranging

from easy, low-cost options to large-scale renovations. Continuous support is provided through community “champions” that host community gatherings and provide support to participants and energy-savings information follow-up. Moving forward, this type of program would require a sustainable funding model to support program managers.

Examples from Other Communities

Waterloo Region – Community Energy Investment Strategy

Within the [Community Energy Investment Strategy](#) for the Waterloo region, the municipal energy plan for the Waterloo region is seeking opportunities to retrofit existing homes. The programs include:

- Enbridge has two programs: Enbridge Home Efficiency Rebate program and Enbridge Weatherization program. Available for Enbridge customers only.
- The Province of Ontario’s Energy Affordability Program.

Although rebates are limited at this time, the overall view moving forward is that there is municipal support for homeowners to sustainably maintain and operate their homes (REEP Green Solutions, March 2021).

EXISTING PROGRAMS & SERVICES

The need to support homeowners through navigating the retrofit landscape is not a new phenomenon in North America and there are some services that currently exist to support homeowners. They range from simple websites that summarize rebate information to full-serviced organizations that have energy coaches and provide information sessions as well.

1. [CleanBC Better Homes](#)

CleanBC Better Homes is BC’s online hub for homeowners and businesses to access information, rebates, and support to renovate new and existing homes and buildings. The Province of British Columbia and the Government of Canada fund the program under the Low Carbon Economy Leadership Fund and the rebates are administered by BC Hydro, FortisBC and BC Housing.

Resources offered include:

1. A rebate search tool
2. Single application for CleanBC Better Homes, BC Hydro, FortisBC and local government rebates

Prepared for:



Developed by:



3. Information on energy efficiency upgrades and accessing rebates
4. Free Energy Coaching Services for homeowners and businesses undertaking renovations, including a phone and email hotline staffed by energy coaching specialists
 - The coaches are trained energy-efficiency specialists who provide general advice about the available rebate programs and upgrade options
 - Coaches are accessible by a toll-free hotline and email and translation services are available
 - Directs homeowners to appropriate program representatives
5. Search tool to find registered EnerGuide Rating System EAs
6. Contractor directories to find registered contractors

2. [Show me the Green | Canadian Government Home Renovation Grants & Rebates](#)

This is an online resource only and it identifies all the rebates available by federal, and provincial governments, utilities, and various renovation grants.

Funding for this site seems to be coming through paid advertisements on the website.

3. [Natural Resources Canada](#)

NRCan aims to provide information on how to assess and improve energy performance of old and new homes. They provide a listing of programs and incentives provided by the government to help Canadians consume less energy and save money.

Resources offered include:

- Education on the benefits of making energy efficient upgrades for homes, how to invest in your home to save money and energy, how to buy a new energy efficient home, etc.
- Directories for available rebate and incentive programs, and for local service organizations, which offer home evaluations
- A chatbot to answer your questions relating to making your home energy efficient
- Professional opportunities for those in the industry looking to become certified

4. [Zero Energy Project – Oregon](#)

The Zero Energy Project is a non-profit educational organization. Their goal focuses on helping home buyers, builders, designers, and real estate professionals take meaningful steps towards radically reducing carbon emissions and energy bills by building zero net energy homes and near zero energy homes. Part of their mission is to facilitate connections between industry professionals and remove barriers to entry to empower people to adopt a zero-energy home.

Resources offered include:

- Homeowners making simple upgrades or builders specializing in complete energy retrofits can benefit from the information provided on the step-by-step processes to take
- Renovation case studies
- Financing information

Prepared for:



Developed by:



v

Appendix B: Interview Questions and Interviewee List

WHO DID WE SPEAK WITH, AND WHAT DID WE ASK THEM?

List of Interviewees

Burlington Hydro	Town of Bridgewater, Nova Scotia
Clean Air Partnership	Town of Halton Hills
City of Burlington	Town of Milton
Enbridge Gas	Town of Oakville
Good Energy Partners	Oakville Hydro
Halton Hills Hydro	Our Energy Guelph
Independent Electricity System Operator	Region of Halton
Mohawk College (for City of Burlington)	

Interview Questions

Participants were provided with a one-page backgrounder on the process and the following questions were distributed in advance:

1. Do you have any questions about the study or the background information I've shared with you?
2. HEN would like to ensure the study addresses the needs of the Halton community. When it comes to the implementation of deep energy retrofits, what kinds of needs do you see in our community?
3. We understand that work is already underway across Halton on deep energy retrofits.
 - a) What's your thinking on deep energy retrofits, as a way to decrease greenhouse emissions?
 - b) What role do you think HEN should play, in encouraging deep energy retrofits, or in encouraging cuts in emissions at household levels, more broadly?
 - c) Is your organization doing any work on deep energy retrofits?
 - Probe: Why / why not?
 - d) Is there any group or organization – in Halton or elsewhere – that you think is doing this kind of thing (promoting deep energy retrofits) well?
 - Probe: What are they doing? What do you admire?
 - e) Can you think of any groups or organizations that HEN could or should look to? As a partner, collaborator, or source of information?

Prepared for:



Developed by:



vi

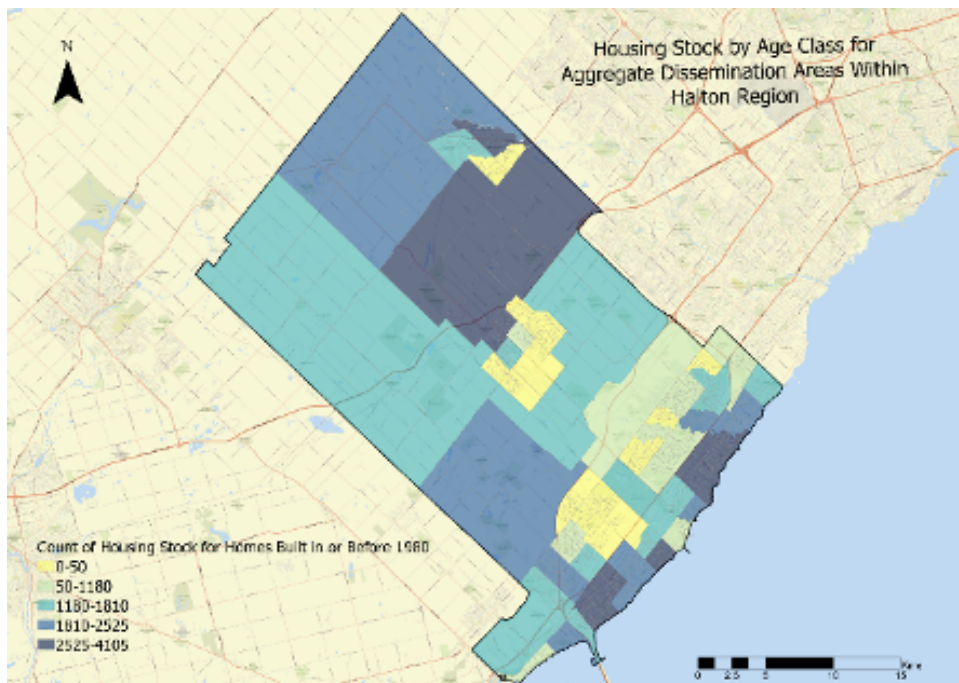
- f) Can you think of any groups that this social purpose organization should avoid overlapping or competing with?
4. What do you think will be the key challenges or barriers that HEN should consider, as we explore the feasibility of this social purpose organization?
 - a) Are there any important policy or regulatory barriers that HEN should keep in mind?
 - b) Do you have any thoughts about Halton detached homeowners, and their response to deep energy retrofits?
5. A social purpose organization intentionally seeks to combine environmental and social impact with revenue growth and profit-making. HEN is studying the feasibility of a social purpose organization to implement home energy retrofits in Halton. We are exploring this model, but if it's understood to be a good one, it does not necessarily need to be operated by HEN. Can you tell me what you think of this idea?
 - Probe: Why / why not?
6. Do you think that such an organization in Halton has the potential to be financially sustainable? Why or why not?
 - a) What opportunities do you see for revenue, to fund operations?
 - b) Do you think there is enough need, or enough room in "the market" for another actor?
7. If HEN were to proceed with such an organization, do you see any potential benefits or risks to your organization?
 - a) How could this proposed organization do to best align with your organization's directions and needs?
 - b) Is there anything that you would definitely NOT want to see happen?
8. In principle, do you think your organization would consider a relationship with such a social purpose organization?
 - a) What kind of value would you want to see this relationship deliver?
 - Probe: Does such a partnership align with any strategic plans or organizational goals that you have?
 - b) Do you think your Board or Council would be interested in it?
9. HEN is exploring how such an organization can have a meaningful social and environmental impact. What kind of impact do you think we should be aiming for?
 - a) When you think of others having meaningful social and environmental impact (of any kind), who do you think is doing this well? (In Halton or anywhere)
10. Is there anything else that you would like to talk about today, including anything I might not have asked you or any advice as we move through the feasibility study?

Appendix C: Potential Areas to Target for Deep Retrofit Programs

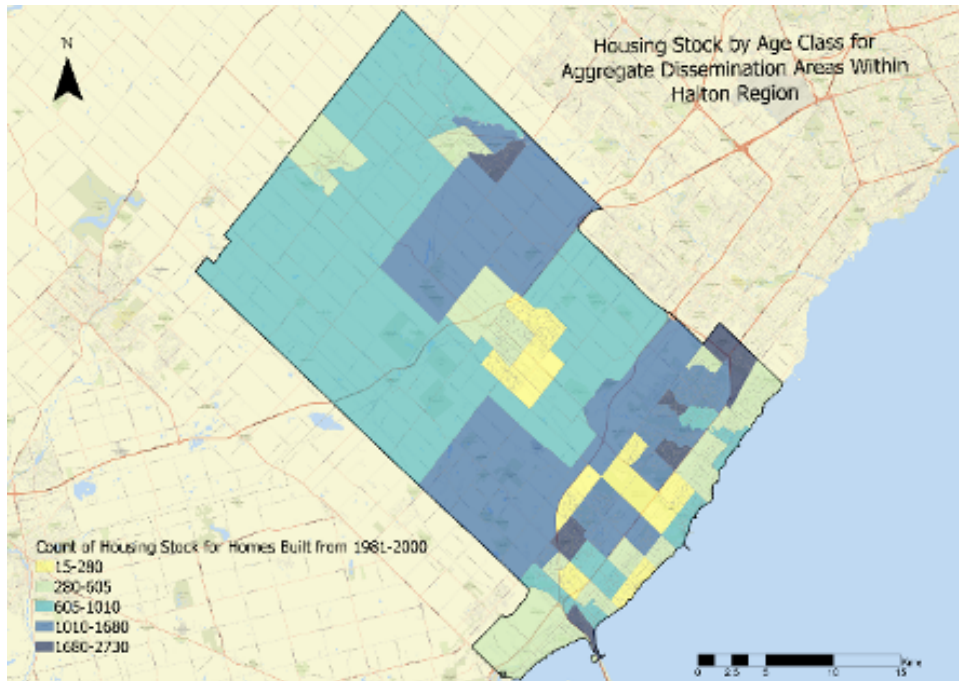
In Halton Region there are 61 aggregate dissemination areas. An aggregate dissemination area (ADA) is an aggregation of adjacent dissemination areas with a population count between 5,000 and 15,000 people. Dissemination areas are a small, relatively stable geographic unit often used to report neighbourhood level data. ADA boundaries are based on population and not geographic area.

In the maps, ADAs are colour coded by quintile. Maps 2 and 3 present housing stock counts by aggregate dissemination area for houses built in the year 1980 or before and for houses built between 1981 and the year 2000 respectively.

The 20% of ADAs with the highest housing stock for the respective reporting period are colour coded dark blue and the 20% of ADAs with the lowest housing stock for the respective period are colour coded yellow. The legend also provides the housing stock count range for the respective quintiles. The maps offer insight into potential areas to target for deep retrofit programs.

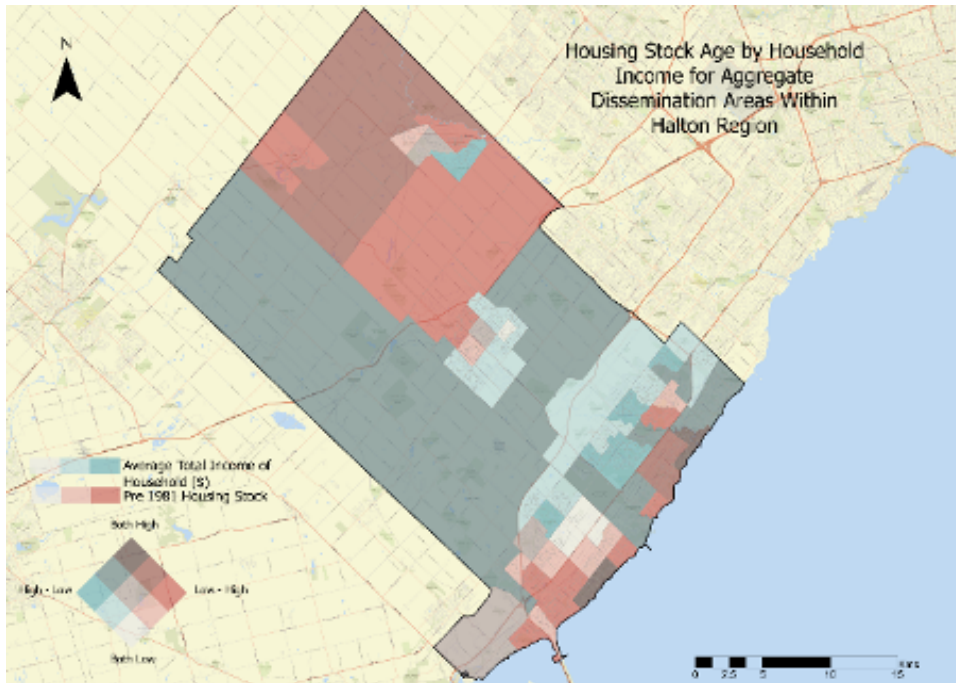


Map 2. Housing stock built prior to 1981

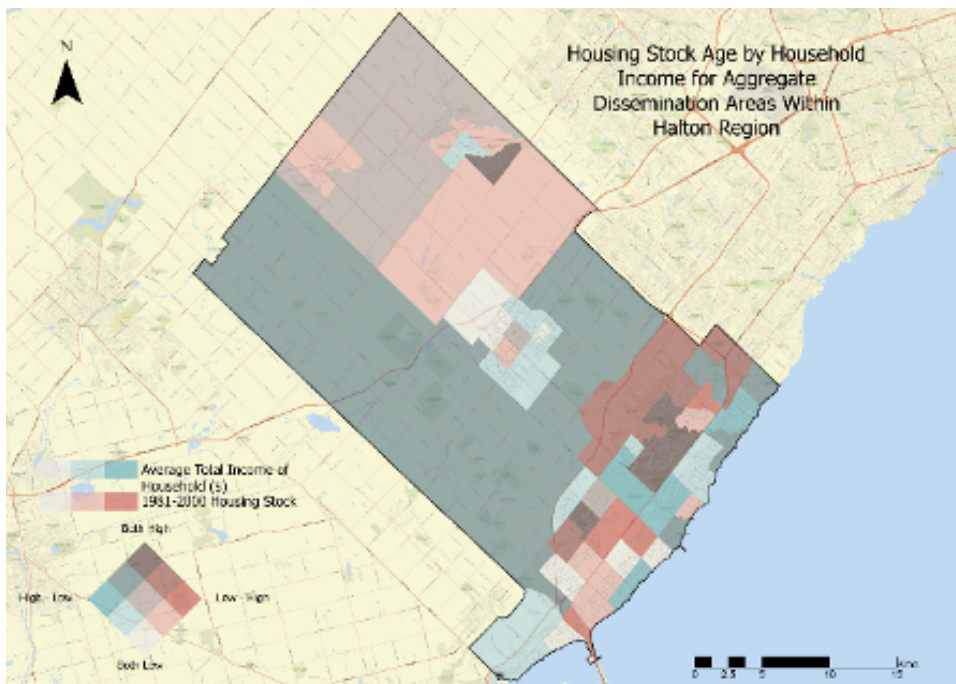


Map 3. Housing stock built between 1981 and 2000

Maps 4 and 5 apply a household income screen to the housing stock data presented in maps 1 and 2. Income is strongly associated with household likelihood to adopt energy efficiency measures (Das et al., 2017; Kassirer, 2018). In maps 3 and 4, income is colour coded on a blue scale and dwelling count is colour coded on a red scale. ADRs with the highest concentration of housing stock built in the respective period and highest average household income, for example, are the dark blue and red overlap areas.



Map 4. Housing stock by household income, pre-1981



Map 5. Housing stock by household income, 1981-2000

Appendix D: References

WHAT SOURCES WERE USED TO COMPLETE THIS REPORT?

CALP and Integral Group. 2019. Building energy retrofit bundling programs: Report and Recommendations for the City of Vancouver.

https://calp2016.sites.olt.ubc.ca/files/2019/06/Home-Energy-Retrofit-Bundling-Report_2019.pdf

Canada Green Building Council. 2016. A Roadmap for Retrofits in Canada: Charting a path forward for large buildings.

CBC. 2021.. Budget goes big on green spending. <https://www.cbc.ca/news/politics/liberal-federal-budget-2021-reaction-1.5991419>

C40. 2021. The Multiple Benefits of Deep Retrofits: A toolkit for cities.

https://www.c40knowledgehub.org/s/article/The-Multiple-Benefits-of-Deep-Retrofits-A-toolkit-for-cities?language=en_US

Das, R., Richman, R. & Brown, C. 2017. Demographic determinants of Canada's households' adoption of energy efficiency measures: observations from the Households and Environment Survey, 2013. *Energy Efficiency*, 11, 465-482.

Environmental Commissioner of Ontario. 2019. Energy Conservation Progress Report. Pp. 94-127.

https://www.auditor.on.ca/en/content/reporttopics/envreports/env19/2019_EnergyConservationProgressReport.pdf

Federation of Canadian Municipalities. 2021. <https://fcm.ca/en/news-media/news-release/gmf/home-energy-retrofit-financing-initiative-expanded>

Gamtesa, S. 2013. An explanation of residential energy-efficiency retrofit behavior in Canada. *Energy and Buildings*, 57, pp. 155-164.


Government of Canada, Business and Industry 2019. Start, build, and grow a social enterprise: Start your social enterprise. http://www.ic.gc.ca/eic/site/053.nsf/eng/h_00006.html#s1

Halton Region, Climate Change Discussion Paper Regional Official Plan Review, 2020.

<https://www.halton.ca/Repository/Climate-Change-Discussion-Paper>

Kassirer, J. 2018. A case study of the Fort Collins Energy Conservation program. Tools of Change Available at <https://www.toolsofchange.com/en/case-studies/detail/707>

Prepared for:  HALTON ENVIRONMENTAL NETWORK

Developed by:  KENNEDY CONSULTING



Miranda, W. Innoweave. 2020. Social Finance Investment Readiness Workshop Presentation.

Natural Resources Canada's Office of Energy Efficiency. 2016. Energy Efficiency Trends in Canada 1990 to 2013.

Norman, J., MacLean, H., & Kennedy, C. 2006. Comparing high and low residential density: life-cycle analysis of energy use and greenhouse gas emissions. *Journal of Urban Planning and Development*, 132(1), 10–21.

Statistics Canada. 2016. 2016 Census Profile. Ottawa


The City of Ottawa. 2019, Pathway Study on Existing Residential Buildings in Ottawa.
https://documents.ottawa.ca/sites/documents/files/pathway_study_exist_resd_en.pdf

Town of Oakville. 2020. Community Energy Strategy.
<https://www.oakville.ca/assets/general%20-%20environment/Community-Energy-Strategy.pdf>

United Nations. 2021. Sustainable Development Goals .
<https://unstats.un.org/sdgs/metadata/?Text=&Goal=9&Target=9.4>

Wade, J. 2021. Social Enterprise Feasibility Study Household Retrofit Management Services. Prepared by Social Delta for REEP Green Solutions.

Prepared for:  HALTON ENVIRONMENTAL NETWORK

Developed by:  KENNEDY CONSULTING

