

Advancing Energy Labeling in the Residential Sector

A Guide for Canadian Municipalities
December 2022

Acknowledgements

About The Clean Air Partnership

Clean Air Partnership (CAP) is a registered charity that works in partnership to promote and coordinate actions to improve local air quality and reduce greenhouse gases for healthy communities. Our applied research on municipal policies strives to broaden and improve access to public policy debate on air pollution and climate change issues. Clean Air Partnership's mission is to transform cities into more sustainable, resilient, and vibrant communities where resources are used efficiently, the air is clean to breathe, and greenhouse gas emissions are minimized.



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Executive Summary

Our homes, businesses, and buildings are where we live, work and gather. They provide shelter and space for our communities, make up our cityscapes, and anchor our economy. However, these buildings also represent the third-largest source of greenhouse gas (GHG) emissions in Canada. Heating spaces, heating water, and supplying electricity to buildings generate 18% of Canada's annual emissions.

If Canada wants to reach its goal of a 40-45% emissions reduction by 2030, and if provincial, territorial, and municipal governments are to meet their targets, it is essential that we reduce emissions from this source. As urban populations grow and cities develop, it is increasingly important for all levels of government to support public policy and programs that can tackle building sector emissions.

A key step in achieving building emissions reductions is through home energy labelling. While we may expect to

see energy or environmental labelling on items such as food products, appliances and vehicles, there is currently no such labelling scheme for our homes, which are the single largest purchase most Canadians will ever make.

Energy efficiency is recognized as one of the most cost-effective ways to help consumers save money by saving energy, make housing more affordable, and reduce GHG emissions. Home energy labelling schemes, sometimes called Home Energy Rating and Disclosure (HERD) programs,

would help boost demand for energy efficiency by revealing a home's "hidden" energy performance, improving energy literacy, and creating an informed market that rewards better-performing homes.

Well-designed HERD programs allow homeowners and potential buyers to understand the efficiency of their homes and make appropriate decisions around retrofits and purchase choices. In addition, HERD programs can offer a range of other benefits including job creation, economic development, improved health, and increased home values.

Despite our understanding of energy labelling, and the availability of the Canada's federal EnerGuide home energy rating system, no Canadian jurisdiction has mandated HERD.

This report aims to assist municipalities and higher levels of government in the implementation of HERD programs. It provides international examples of energy efficiency disclosure and rating systems to support the creation of domestic programs. It provides the key benefits, barriers, and actors involved in HERD programs. It also provides the results from Clean Air Partnership's 2022 National HERD Survey and key findings on consumer preferences and experiences in accessing HERD programs. Finally, the report presents a practical roadmap for the planning, implementation, and evaluation of HERD programs.




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Section 1

Introduction and Landscape Review





In 2020, buildings accounted for 13% of Canada's total greenhouse gas (GHG) emissions, - 18% when including the emissions associated with electricity used inside them. These emissions come from the more than 15 million residential buildings and 480,000 commercial and institutional buildings across Canada.

A big factor in a building's emissions is its age. Large buildings, such as multi-residential properties, built before 2005 consume 50% more energy to operate than those built today, while low-rise buildings built before 2005 consume 200% more energy than those built today. This energy wastage results in tangible economic, environmental, and social costs to homeowners, the public, and the climate.

The low-rise residential building sector, which includes single detached and

single attached homes, accounts for 83% of Canada's total residential energy usage. These buildings emit GHGs such as methane and carbon dioxide from burning fossil fuels to heat the air and water in a home, and from using electricity powered by fossil fuels.

Our homes and buildings deeply influence our lifestyles, reflecting who we are individually, and as a community, and represent not only our inheritance from the past but also our legacy for the future. The construction materials

The low-rise residential building sector accounts for 83% of total Canadian residential energy usage.

and heating options that we choose today will last for generations, so it is essential to understand how our buildings contribute to climate change. To reduce residential building emissions, the energy used to heat and operate our homes must be greatly reduced through energy efficiency upgrades and, ultimately, homes need to switch to clean energy sources for space and water heating.

While we can address emissions from new buildings through energy and emissions standards, emissions from our existing housing stock must be addressed through building retrofits, reducing the total energy used for heating, cooling, and building operations. These retrofits include sealing air leaks, adding insulation, upgrading and right-sizing heating and cooling systems, and upgrading doors and windows. For existing homes, energy efficiency investments ideally pay for themselves over time through reduced energy costs.

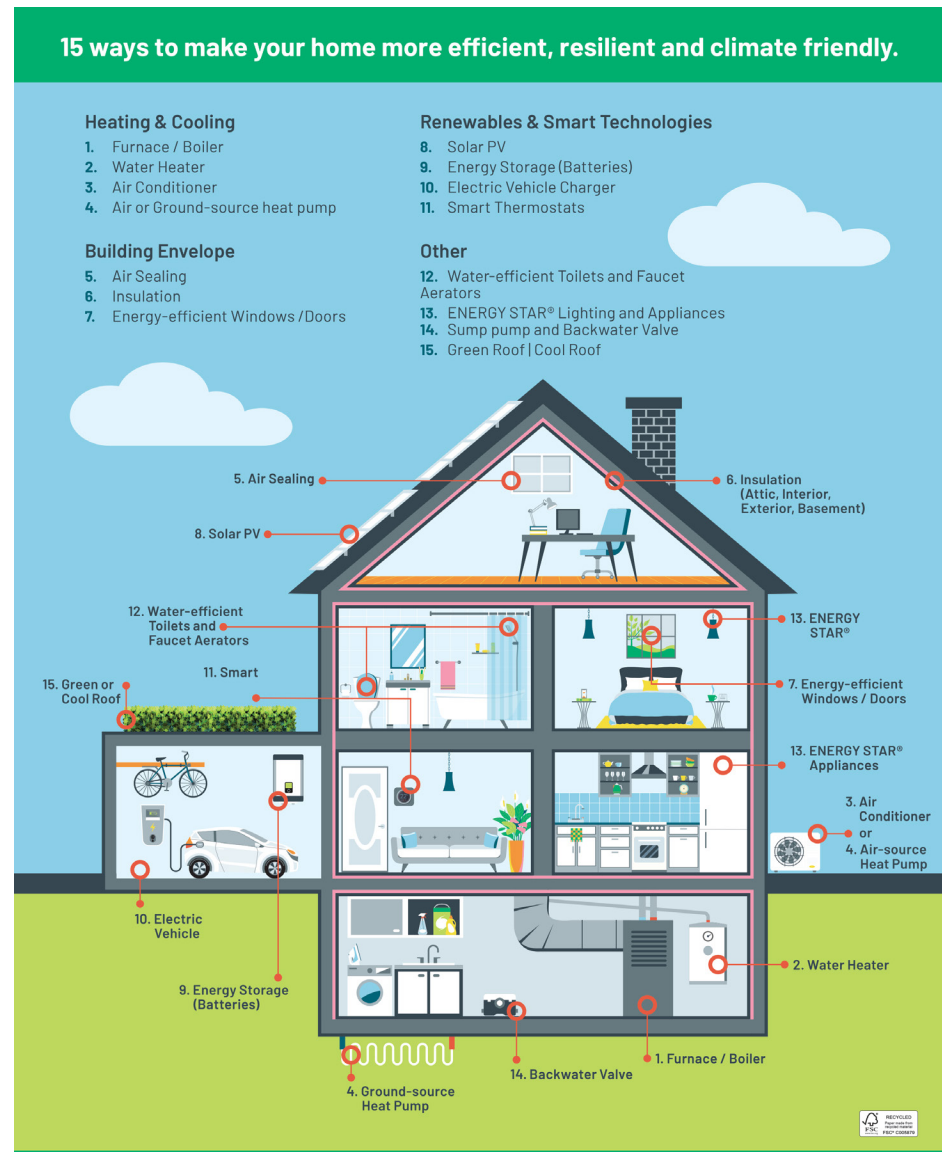


Figure 1 - Home upgrades to maximize the energy efficiency
(Image Credit: BetterHomes TO)

HERD as a Residential Energy Efficiency Driver

Governments and utility providers currently have very little access to energy performance data for the residential building sector. While utility providers may have access to data on householder energy consumption, they typically do not disclose this information to other stakeholders such as municipalities. This limits the ability to merge utility datasets to provide a complete picture of a home's energy use.

These datasets also lack details such as occupancy profiles, home characteristics, energy use intensity, estimated energy end uses, heating systems, air tightness of the building envelope, and levels of insulation. Better information can lead policy and program creation for utilities and governments to help address the energy efficiency gap.

The data collected from energy assessments can be combined to generate a sample archetype against which energy ratings of a given home can be compared. Public access to this dataset would allow homeowners to get information about the distribution of ratings for their neighbourhoods— providing an easy way to benchmark performance against comparable homes.

These datasets would support the growth and expansion of the home energy improvement industry, increasing demand and supply of energy assessors, providing information on market opportunities, market penetration strategies, and development of new energy efficiency markets.

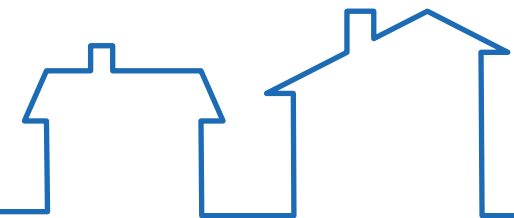
Home Energy Labelling provides visibility to home energy performance and can accelerate the market transformation toward reducing emissions from homes. National, provincial, territorial, and municipal labelling strategies can drive the market toward increased residential energy efficiency.

Market transformation for energy efficiency occurs when stakeholders change their behaviour and higher building energy performance is rewarded and valued.

This can be achieved through:

- Significant uptake of home energy labelling by the community
- Increased homeowner understanding of home energy performance
- Realtors communicating the value of energy efficiency

- Home builder's decisions and home appraiser's valuations reflecting the value of better energy performance
- Renovators incorporating this information to suggest energy efficient renovations
- Regulators accessing energy performance information for better planning and policy development; and
- All relevant parties considering information on an energy label.



Landscape Review

Improving the energy efficiency of residential buildings is essential for reducing GHG emissions. HERD has been identified as a central mechanism to achieving building emission reductions.

Mandatory energy labelling provides homebuyers with operational energy consumption data at the time of purchase. This enhances the visibility and value of energy efficiency, and the implementation of energy efficiency upgrades.

HERD programs are implemented to reveal a home's "hidden" energy performance, resulting in a better-informed market that rewards better-performing homes. Well-designed HERD programs can drive market transformation by supporting homeowners in identifying energy efficiency upgrades. Additionally, HERD programs offer a range of other benefits, including:

- Enforcing local and regional building codes
- Increasing property values
- Creating economic opportunities for multiple industries (e.g., home construction and renovation, HVAC, electrical, and insulation contractors, energy efficiency program administration, utility providers, government, academia, scientific community)
- Supporting better design, implementation and evaluation of energy efficiency programs
- Building an energy efficiency economy
- Cost savings

International HERD Programs

Internationally, there are many jurisdictions which have introduced mandatory HERD programs. Europe and the Australian Capital Territory (ACT) have had one in place for over 15 years. Several cities in the United States have also implemented a range of HERD programs.

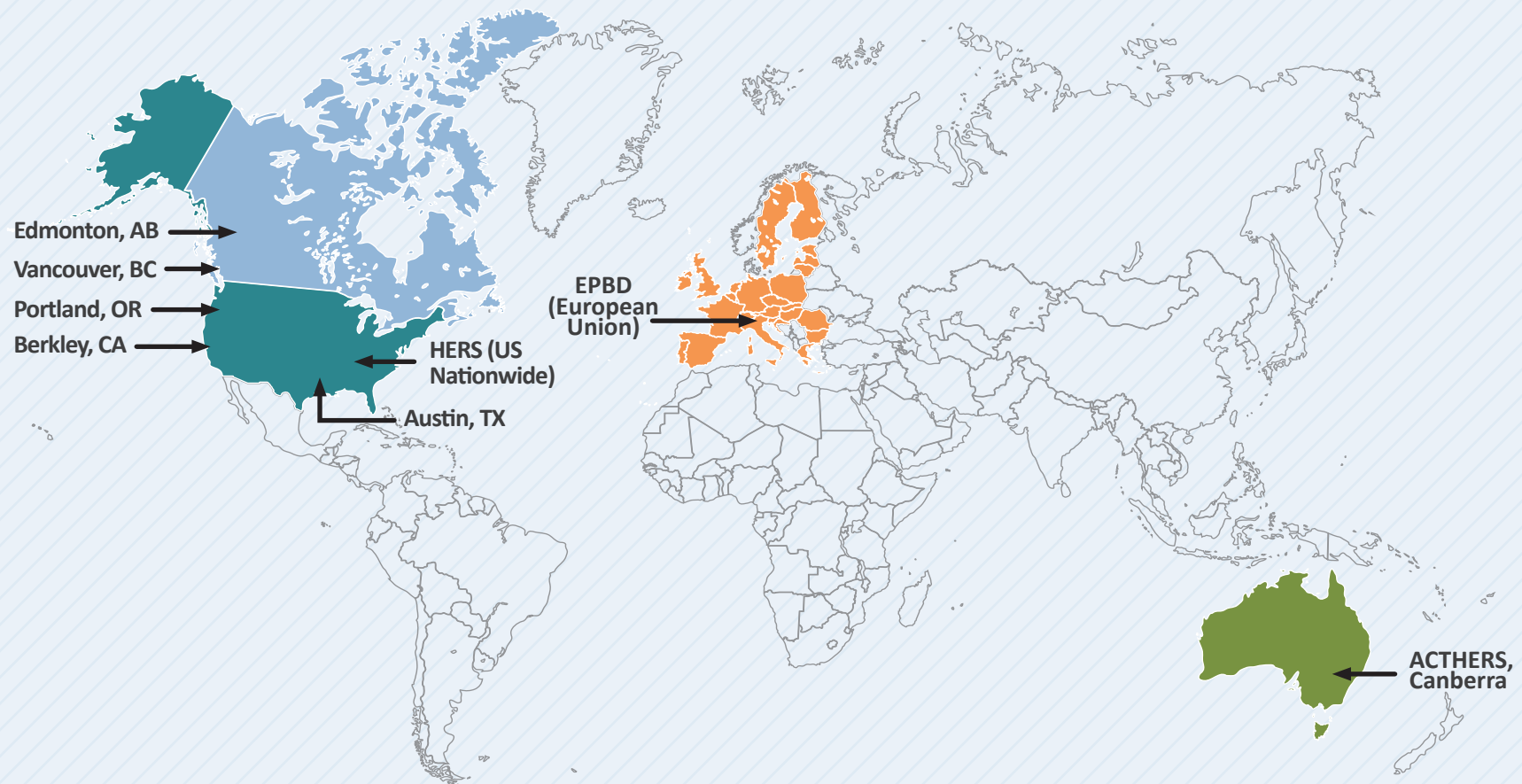


Figure 2- Jurisdictions currently advancing HERD Programs

EUROPE



€399,000

347 Sundays Well, Naas, Co. Kildare

4 beds | 3 baths | 127m² | BER C2 | Bungalow | Refreshed on Nov 4, 2022

Eircode: W91 R9AW



Figure 3 - Sample EU property listing detailing building energy rating of C2

Energy Performance of Buildings Directive in Europe

The European Parliament enacted the European Union's Energy Performance of Buildings Directive (EPBD) in 2003. EPBD requires all European Union (EU) members to develop building energy performance measurement protocols and establish building energy certifications for residential and commercial buildings. Specifically, building owners must present prospective buyers and tenants with Energy Performance Certificates (EPCs) during a sale or lease transaction or at the time of building construction.

Additionally, EPBD mandates large public buildings to display an energy certificate in a prominent location within the building. The certificate includes building energy performance information and benchmarks set by each Member State, and recommendations for energy efficiency improvements. Qualified energy assessors carry out the certification process. For different member states, the administrative bodies of the EPC programs vary from government to third-party companies.

The assessment results are prepared using specialized software and provided to the homeowner and a centralized register. Advertisements must also include the EPC score when a home is listed for sale or rent. The full report is provided to potential buyers, including recommendations to improve energy efficiency and available renovation incentives.

EPCs generally include:

- Asset ratings of the home and calculated energy use for standard occupancy
- Evaluating space and hot water heating; and
- Ventilation and lighting

The labels vary among member states, with most applying a letter grade rating, where A grade indicates the highest level of energy performance. In 2010, the European Commission (EU cabinet) introduced additional requirements, such as mandating labels in all advertising and reinforcing quality assurance and compliance measures. Most EU members have also set minimum energy standards for new homes and implemented financial incentive programs for energy efficiency renovations.

Studies have shown that the EU's energy labels influence prices in the real estate market, create local jobs, and deliver crucial information to policy makers. Labels have increased the transparency of the real estate market, and houses with a greater energy efficiency rating increase domestic property prices. This is demonstrated by homeowners willing to pay a premium for homes labelled as more energy efficient.

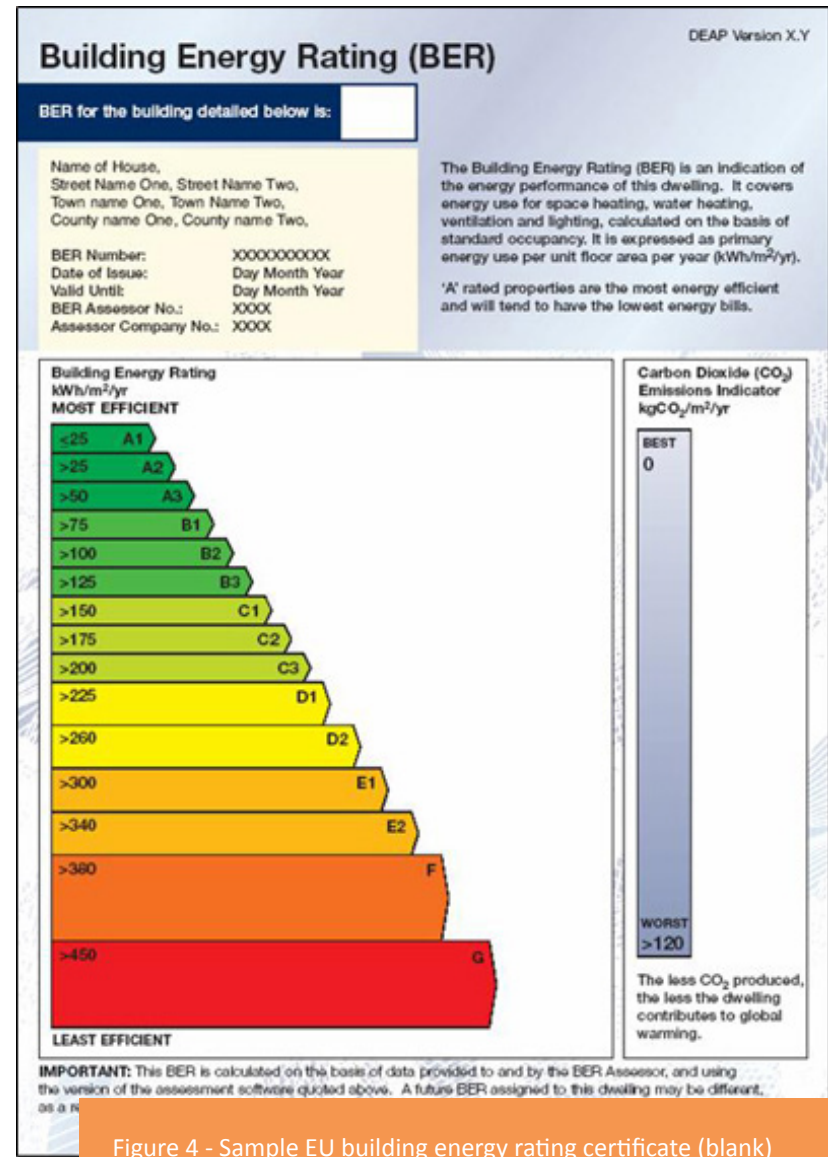
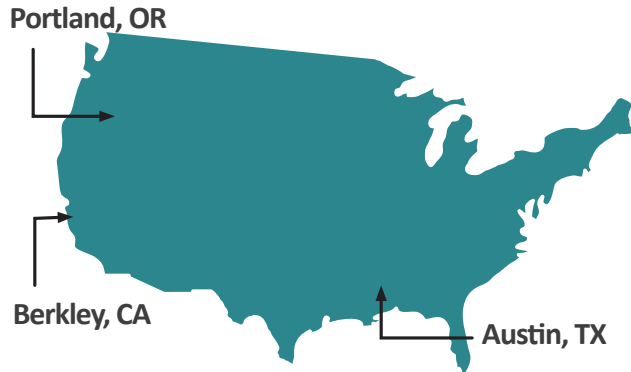


Figure 4 - Sample EU building energy rating certificate (blank)

THE UNITED STATES



HERD in the United States

Several jurisdictions in the U.S. have adopted home energy rating programs. Some states have mandated home energy ratings, however, most work to advance energy performance in U.S. homes comes from voluntary efforts.

For example, Residential Energy Services Network (RESNET), a not-for-profit association, developed a national standard called Home Energy Rating System (HERS) in 1995. HERS rates the efficiency of a home compared to a standard house with similar dimensions and climate conditions. A certified rating provider, working under the supervision of RESNET, determines the

individual house rating.

In 2021, 313,153 homes obtained a HERS rating in the U.S., pushing the total number of homes rated to over 3.3 million since the program's launch. Additionally, the U.S. Department of Energy launched its "Home Energy Score" program in 2010, with over 120,000 home energy scores were conducted from 2010 to 2019.

Three U.S. jurisdictions – Austin (TX), Berkeley (CA), and Portland (OR) have mandated the disclosure of energy information at the time of property listing or sale. These cities have adopted a relatively simplified audit process, without in-person energy efficiency quantification through blower door testing. The final reports delivered to homeowners are focused on recommendations for upgrades and the potential to save on utility bills. Austin reported increased participation in energy efficiency programs after implementing a mandatory program for existing homes. The City of Portland maintains an online database called the Green Building Registry, where real estate agents and the public can search a property by its address and postal code. Portland's transition from voluntary to mandatory disclosure saw program compliance increase from 2% to 65%.

Local Realtor Associations have opposed the HERS programs in the U.S. and argued that providing energy information may put inefficient homes at a disadvantage and impact local real estate markets. As a result, some efforts have been channelled toward working collaboratively with realtor groups to promote voluntary programs. More recently, some home buyer-focused portals have started including annual energy costs and ratings to meet this demand. This is emerging trend will rapidly change the HERD environment in the future as this information becomes more widely available.



Figure 5 - City of Portland sample home energy score

AUSTRALIA



HERD in the Australian Capital Territory

Since 1999, home sellers in the Australian Capital Territory (ACT) have had to disclose their homes' energy efficiency information to potential buyers. The Energy Efficiency Rating (EER) must be provided to consumers in all advertising material, and the entire certificate must be provided with the sale transaction. The EERs use the ACT House Energy Rating Scheme (ACTHERS). Under ACTHERS, ratings are calculated through energy modelling, and houses can achieve ratings from 0 to 6 stars, with six being the highest. The house energy rating is independent of the size and type of housing.

The Building Code of Australia has required a minimum rating for all new houses since 2010. This mandatory minimum rating does not apply to existing homes. The EER is calculated by an accredited assessor using a home energy rating computer software program. Assessors are trained and certified by an accrediting organization. Program evaluations reveal that owners are increasing the energy efficiency of their homes, and purchasers are demonstrating that they perceive value in the EER through higher purchase prices.

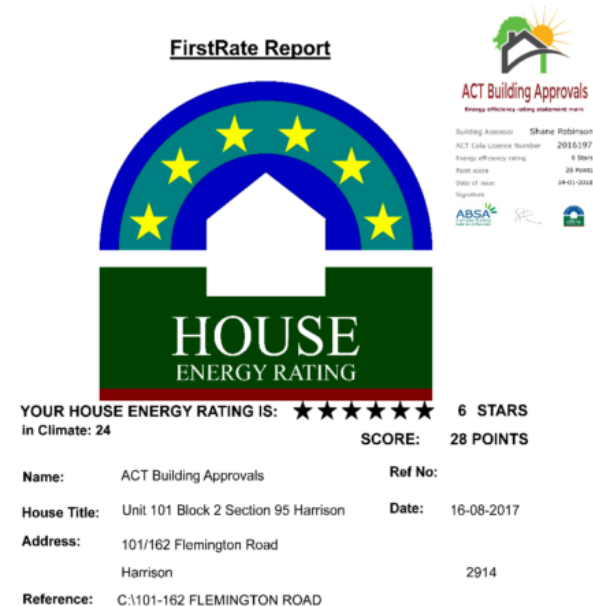


Figure 6 - Australian Capital Territory House Energy Rating Scheme (ACTHERS) label

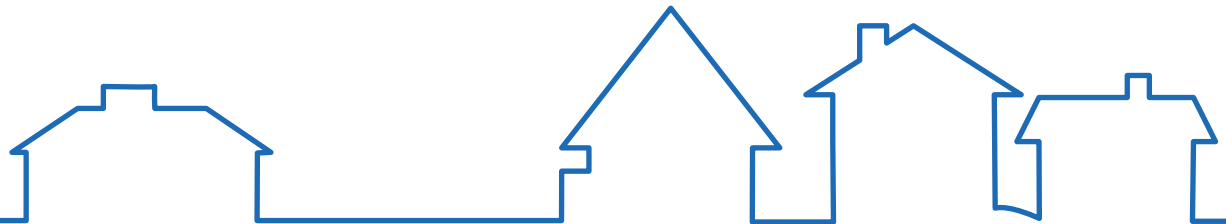
Criticism of the EER includes the lack of rigorous training for energy assessors, inconsistent rating results and a confusing rating system, further exacerbated by the phasing out of an older scale in favour of a new scale. Fluctuating levels of compliance with the system result in poor-performing houses hiding behind not yet having completed a rating. There is no penalty for non-disclosure, and some homeowners have opted to accept a '0-star' rating to avoid paying for an assessment that can cost upwards of \$1,000.

Voluntary HERD Programs

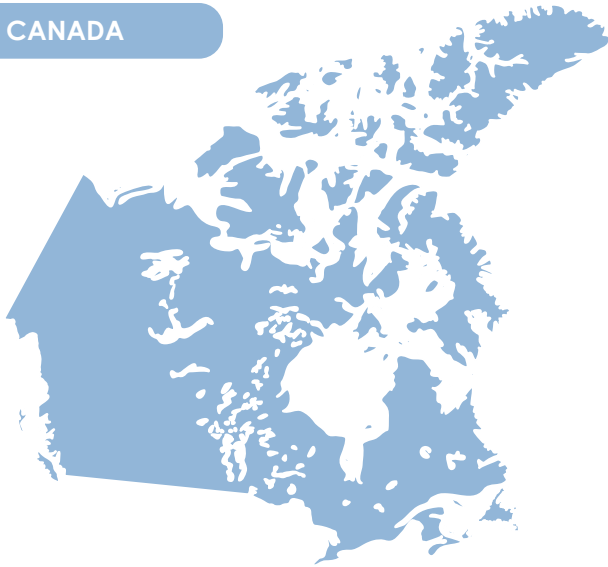
HERD programs function primarily as a way for homeowners and prospective home buyers to compare the efficiency of a home with the others in their vicinity. By adopting voluntary programs and their technical standards, homeowners can be encouraged to test and adopt modern technologies and techniques to help them achieve higher levels of energy efficiency. Over time, if

voluntary programs are successful, local building codes can adopt higher energy efficiency levels.

Voluntary HERD programs can provide a mechanism to introduce and test the market potential for a home energy rating system. This way, homeowners, buyers, real estate professionals and utility companies can assess their effects without feeling pressured to adopt a new status quo. As a result, voluntary HERD programs are less likely to meet resistance from different market players and can generate baseline data to support future mandatory rating disclosure programs.



CANADA



HERD in Canada

EnerGuide Rating System

Natural Resources Canada's EnerGuide energy rating and labelling system is a tested method of certifying the energy efficiency of Canadian homes. EnerGuide provides a

standard measure of a home's energy performance. The rating indicates a home's current efficiency and potential retrofits and upgrades needed to achieve higher efficiency. The EnerGuide label shows home-owners and potential buyers exactly how efficient a home is and allows them to compare it with similar homes in their neighbourhood and across Canada.

Issued by Certified Energy Auditors, EnerGuide ratings and labels show rated energy consumption in gigajoules (GJ) per year. Homeowners are provided with a Homeowner Information Sheet that has detailed information about the home, its rated energy use, how the energy is used, and upgrade recommendations. Typically, an average new home built to code will consume approximately 93 GJ/year of energy and an older home will consume higher than 93 GJ/year.

Metro Vancouver Area

Metro Vancouver launched Canada's first voluntary home energy labelling and disclosure program, [RateOurHome.ca](https://www.rateourhome.ca). This program demonstrates how GHG reductions

“By mapping homes with home energy labels on RateOurHome.ca, Metro Vancouver demonstrated the need for accessible home energy labelling information.”

can be achieved through participation in home energy labelling programs. RateOurHome.ca was developed as part of a pilot program to assess the feasibility and interest in a home energy labelling information and disclosure website for Metro Vancouver residents. The pilot project provided data and recommendations and laid the groundwork for future labelling & disclosure programs across the country.

CityGreen’s Metro Vancouver EnerGuide Rating System (ERS) Critical Mass Report notes that since 2007, 61,785 new and existing homes, representing 11% of Metro Vancouver’s housing stock, were labelled using the ERS. In addition, an estimated 88,781 pre- or post-upgrade ERS energy evaluations were completed in existing homes in Metro Vancouver from 2007-2017, while 23,830 plan evaluations and energy labels were provided for new homes. Approximately 39,395 homes completed a pre-and post-upgrade EnerGuide home energy evaluation. The

home upgrades completed since 2007 represented modelled GHG savings of 102,135 tonnes of carbon dioxide equivalent (\dagger CO₂e) per year⁵.

By mapping homes with home energy labels on RateOurHome.ca, Metro Vancouver demonstrated the need for accessible home energy labelling information. The lack of widespread and mandated disclosure of this information creates a knowledge gap for homeowners and buyers in this region.

City of Edmonton

The City of Edmonton has a home energy labelling program called Home Energy Plan. Home Energy Plan helps homeowners understand the current efficiency of their homes and obtain expert advice on increasing energy efficiency. As part of the program, homeowners will receive \$300 from Energy Efficiency Alberta and \$100 from the City of Edmonton to offset the cost of a Home Energy Evaluation if

they opt to share the results on the Home Energy Map.

The program also provides rebates for home retrofits. After the preliminary evaluation, homeowners can receive rebates for a wide range of efficiency products and services, including better insulation, glazed windows and efficient furnaces. Homeowners in Edmonton receive 20 percent more rebates than the rest of Alberta due to the top-up from the City of Edmonton.

[Edmonton's Home Energy Map](#) displays home energy labels and allows homebuyers to compare their EnerGuide labels with other homes in the city, making energy performance and GHGs more visible for everyone. This program helps homeowners understand their property's energy performance, plan and finance home improvements rebates and incentives, and build energy literacy in the community.

Enabling Legislation

Federally, the Pan-Canadian Framework on Clean Growth and Climate Change states that federal, provincial, and territorial governments will work together with the aim of requiring labelling of building energy use by as early as 2019. Labelling will provide consumers and businesses with transparent information on energy performance.

All provincial governments have the authority to require labelling programs. Ontario was the first Canadian jurisdiction to pass energy labelling regulations when in 2017, the Government of Ontario amended their Electricity Act to integrate mandatory reporting of energy and water use for large buildings. In addition, many other Canadian jurisdictions, such as the province of British Columbia and several BC municipalities, have followed.

Ontario's Environment Plan directed the Ministry of Energy (MOE) to work with the Ontario Real Estate Association (OREA) to encourage the voluntary display of home energy-efficiency information on real estate listings, as is done in Vancouver and Nova Scotia. According to the Ontario Auditor General's September 2020 Report, there has been no progress on this action. In response, the MOE acknowledged the importance of providing energy-efficiency data that helps people make decisions regarding home purchases and committed to re-engaging with the OREA to explore voluntary home energy ratings on real estate listing services.

At a local level, municipalities can use bylaws to advance home energy labelling. In Edmonton, the City Council passed the Clean Energy Improvement Pilot Program (CEIP) Tax Bylaw in 2021. The CEIP is a 2-year pilot

program that provides homeowners access to low-cost financing to undertake energy efficiency upgrades. The eligibility requirements for low-cost financing for efficiency upgrades includes a pre- and post-project EnerGuide Home Evaluation.

In Toronto, the City has stated that it could consider making HERD a requirement when a property gets listed. City Reports state that Toronto could introduce mandatory and enforced labelling with a phased-in approach to help the market prepare and could consider a short (1-2 year) transition period. During the transition period, enhanced education and outreach strategies would be deployed, along with incentives to prime the market for a mandatory HERD requirement.


The City notes that a mandatory program with enforcement will be necessary but will focus on transitioning the market with positive nudges before issuing financial penalties for non-compliance.



Section 2

HERD Benefits, Barriers, and Key Actors





With mandatory and voluntary HERD programs being implemented in jurisdictions around the world, many common direct and indirect benefits have been identified.

Direct Benefits

- 1. Increased energy efficiency** - Home energy disclosure can lead to increased energy efficiency in inefficient homes by identifying potential improvements and energy savings. In British Columbia, 77% of the 96,816 homes that participated in the LiveSmart or ecoENERGY retrofit labelling programs completed retrofits with average energy savings of 26% (Pembina Institute, 2015). By improving the building envelope, insulation, doors and windows, there is less air leakage and internal temperatures are better maintained, resulting in less energy used. HERD programs can also incentivize homeowners to replace older HVAC equipment and lighting with energy-efficient alternatives to help lower utility operating costs.
- 2. Fewer greenhouse gas emissions** - Building envelope or insulation retrofits improve the home's air tightness, with less energy needed to heat and cool the home. If less energy is consumed, then GHG emissions are also reduced. Efficient HVAC equipment uses less energy and incorporates more environmentally sustainable refrigerants, which have a lower global warming potential and ozone depleting potential, minimizing the climate impact.
- 3. Influence on real estate market prices, increased property value** - Some studies have shown there is a price premium for houses labeled as more energy efficient. A study of nine EU jurisdictions found that a one-letter grade improvement translated into a 2-6% increase in home value.
- 4. Job creation** - When HERD programs are implemented, more energy assessments may be needed to determine the energy rating for the home. To keep up with the demand of energy assessments, energy assessor jobs must be created.

Indirect Benefits

- 1. Energy literacy** - In HERD programs, participants can access energy efficiency information about their home. One of the objectives of HERD is to empower homeowners with accurate and insightful information about the home they are planning to sell, purchase, or upgrade. A home energy label provides homeowners with information about their energy consumption. Studies have found that access to validated, accurate third-party information:
 - Improves consumer energy literacy,
 - Adds transparency to home sales,
 - Allows for comparison of energy performance of equivalent homes
 - Facilitates informed home purchasing decisions
 - Encourages energy efficiency upgrades
- 2. Economic growth** - HERD programs benefit the local economy through job creation in several sectors. More home energy upgrades benefit the construction and renovation industries. Additionally, energy advisor and energy concierge jobs are created. The scientific, technology, and manufacturing sectors also benefit as they are tasked with discovering technologically innovative ways to advance home efficiency.
- 3. Informs and supports other energy efficiency policies** - Studies have found that homeowners are more inclined to complete home energy retrofits if incentive programs exist. The studies revealed that free ridership was low for draft proofing (less than 15%), indicating that, without a home energy audit and incentive program, few participants would have completed airtightness upgrades. HERD programs promote the use of energy incentive programs. Additionally, the use of a HERD program may lead to other energy policies, such as updating Building Codes to incorporate higher energy efficiency standards.

Stakeholder Benefits

With the implementation of HERD programs, many stakeholders benefit. These stakeholders and their benefits are detailed below:



1. Municipalities - Buildings and homes contribute approximately 18% of Canada's GHGs. HERD programs support municipalities in meeting energy reduction targets by motivating homeowners and potential buyers to invest in energy efficiency measures. In jurisdictions that implemented HERD programs, 12% to 37% of home buyers undertook energy efficiency improvements or included more improvements than planned due to the findings of the HERD report (ACEEE, 2016). In this way, HERD contributes to reducing community GHG emissions.

Home energy labelling programs also provide municipalities with accurate data on residential energy consumption and emissions. These data aid in the identification of program gaps and potential opportunities for future programming.



2. Homebuyers - Home energy disclosures can support potential homebuyers in choosing an efficient home, identifying efficiency improvements that can lower energy costs long-term and accurately estimating the cost of operating their home. HERD programs reveal the energy efficiency performance of a building, which then allows an informed market to drive uptake of better-performing buildings. A HERD report card can provide information on the current energy efficiency performance of a property, the costs and benefits of potential renovations, and future energy efficiency performance if the recommended renovations are applied.



3. Home sellers - HERD programs offer a mechanism through which sellers convey the value of energy efficiency improvements, adding a selling point to their homes. A good home energy rating is likely to be interpreted by potential buyers as a saving on energy costs, thus increasing the valuation of energy-efficient homes.



4. Communities - HERD programs advance energy transparency in the community. Energy-efficient buildings are more resilient to weather events and are more comfortable and safe during a blackout or disaster (ACEEE, 2015). Energy efficiency has direct and indirect health benefits. Energy-efficient homes reduce indoor and local air pollution, thus leading to increased community health. Because energy efficient homes cost less to run, HERD programs indirectly improve local economic resilience by increasing households' disposable income and their opportunities to contribute to the local economy.



5. Low-income households - Almost one in 10 Canadian households spend more than 10 percent of their income on residential energy. Direct heating fuel costs are more vulnerable to market price fluctuations, impacting low-income households with limited budgets. For these reasons, there has been increased interest from provinces, municipalities, and utilities in reaching low-income households with clean energy and efficiency programs. Advancing HERD programs helps identify the areas of greatest need where greatest savings can be realized for lower income communities.



6. Realtors - Realtors can use energy labels as a selling point to drive up the valuation of energy efficient homes, which can, in turn, increase their commission. Realtors can help drive market transformation and communicate to home sellers the benefits of having higher energy efficiency ratings.

Barriers

There are a range of potential barriers that must be considered and addressed to allow for the creation of successful HERD programs. These barriers include:

1. Low homeowner motivation to invest in energy audits and efficiency upgrades

Several factors may contribute to a lack of homeowner motivation in undertaking energy efficiency audits and upgrades, such as lack of knowledge and awareness, ambiguity related to costs of retrofitting homes, absence of easily accessible funding options for energy efficiency audits and improvements, lengthy timelines to participate in existing energy audit programs, and lower prioritization for 'invisible' energy upgrades.

Most of these barriers can be addressed through outreach and awareness programs for homeowners, providing information about energy use and savings in the label, and training realtors on standard methods of presenting energy efficiency benefits to their customers.

2. Broader acceptance from multiple actors

To advance home energy labelling programs and ensure their widespread adoption, key market actors, such as the real estate industry, home builders and renovators, architects, and trades, must be motivated to advance energy efficient housing. Insufficient knowledge, relatively low energy costs, lack of clarity on the energy audit process, and confusion about existing rebates can be potential barriers to energy labelling and retrofits. These barriers can be addressed by targeted awareness raising for all groups so that they may understand and explain the benefits and process of energy auditing and the associated home energy ratings

3. Homeowner privacy

Disclosure of a home's energy rating on publicly accessible platforms has been criticized as an infringement on personal privacy. Communicating with the homeowners that a home energy rating is an energy efficiency rating of a home, and no personal information or personal energy consumption information is included can relieve this concern. Some jurisdictions offer additional incentives to homeowners who agree to share their home energy label on a public database, while others require such disclosure through law without incentive.

4. Availability of incentives and funding mechanisms

Utility program incentives and government-sponsored rebates, loans, and funding programs motivate homeowners to invest in energy audits and efficiency upgrades. However, a lack of clarity on available funding (and the compatibility of funds) can impede homeowners from undertaking energy audits

and upgrades. Even if homeowners find rebates to partially support their audits and upgrades, they may face a financial barrier covering the remaining cost. The process of claiming rebates can be lengthy and time-consuming. Simplifying the process to claim rebates and providing incentives can improve the uptake of energy audits and retrofits.

5. Long term financial and time commitment

Advancing market transformation with home energy labelling can take five to ten years from the initial program implementation. This period can be even longer for voluntary programs. In addition, infrastructure and implementation costs to start up and run home energy labelling programs require a long-term financial investment from participating stakeholders. Collaborating with stakeholders ready to make the long-term time and financial commitment to support this market transformation is essential to overcoming this barrier.

“Communicating with the homeowners that a home energy rating is an energy efficiency rating of a home, and no personal information or personal energy consumption information is included can relieve privacy concerns.”

6. Capacity to deliver programs

Before introducing a national or provincial HERD program (assuming use of in-home energy audits), an increase in registered energy advisors may be required to accommodate audit requests. Capacity building programs need to be in place to provide training and resources to candidates and enable them to provide high-quality, accurate, and consistent services.

7. Delivery scale-up

While Canadians are familiar with energy labels on appliances and other products, there is still limited understanding of the concept of home energy labelling. Successful implementation of home energy labelling programs will require jurisdictions to go beyond providing basic information and financial incentives. Jurisdictions must undertake multiple coordinated and overlapping initiatives, including marketing campaigns, public outreach programs, training, and ongoing consumer and industry education.

8. Low energy costs

Energy costs can fluctuate widely due to natural factors or human activities such as war, sanctions, tariffs, carbon pricing, and market forces. When homeowners are subject to significant and unpredictable changes in big-budget items like home energy

costs, it can wreak havoc. The more exposed a home is to price fluctuations, the more necessary it is to reduce its energy consumption through energy efficiency. Energy labelling and subsequent retrofits can reduce the energy consumption of homes and protect them against dramatic rises in energy costs. Conversely, during periods of lower utility costs, homeowners may be disinclined to complete home energy retrofits as savings will not be substantial. Providing education on non-monetary benefits such as home comfort and healthy buildings may help overcome this barrier.

9. Non-compliance

The rate of compliance with any policy measure or program is key to its effectiveness. Higher than expected non-compliance rates can prevail due to factors such as the lack of adequately trained staff to assess compliance, inadequate budget to undertake verification activities and conflicts among jurisdictions in allocating compliance responsibility. Higher non-compliance rates may also arise due to inadequate staff capacity in balancing the development of new policies and monitoring compliance of existing programs, lack of appropriate enforcement powers and processes, and inadequate awareness of requirements among target audiences.

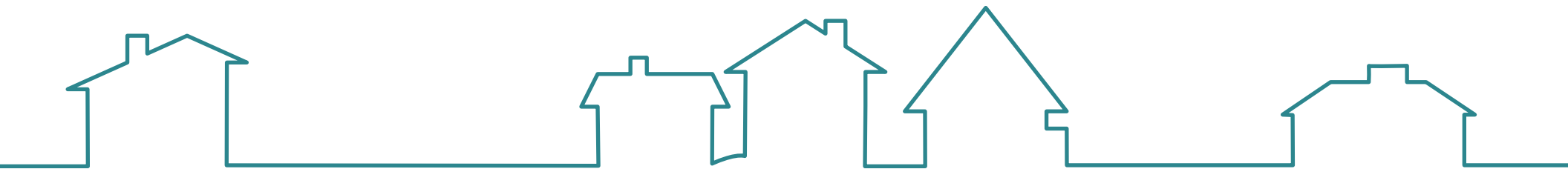
Comprehensive monitoring and evaluation plans must be incorporated in the program design for mandatory energy labelling and disclosure programs. Dedicated staff need to be assigned to ensure program compliance.

10. Program uptake

Voluntary home energy labelling programs typically have low uptake. Achieving significant market penetration requires a regulated and mandatory HERD program. Mandatory programs can face additional barriers such as homeowner and industry opposition. Jurisdictions implementing mandatory programs also need to ensure the availability of energy auditors, home builder and renovation contractors and other related service providers. Income-based financial incentives need to be in place to cover the maximum cost of audits and upgrades for lower-income groups to ensure compliance and inclusion.

11. Homeowner hesitance

A significant barrier to advancing HERD programs is homeowners' perception of programs as time consuming. In many existing programs, homeowners are required to be home for the assessment, and for numerous programs both a pre- and post-renovation audit are required. These requirements mean additional time that a homeowner may have to take off work. Homeowners may also face barriers in securing an energy audit and knowing who to hire for the assessment. Education programs should be in place explaining how to hire an auditor and why it is important.



Key Stakeholder Concerns and Potential Solutions

Stakeholders	Concerns	Potential Solutions
Homeowners & Real Estate Professionals	Low energy efficiency scores negatively impacting home sales.	Present research that shows energy disclosure does not impact sales and informs home sellers and buyers about potential upgrades
	HERD program increasing burden of overall home transaction process.	<p>Explain the benefit of providing buyers and sellers with trustworthy energy data through a standardized HERD program.</p> <p>More efficient homes with higher scores can be sold more expeditiously and at a higher market price.</p> <p>Design the labelling process with shorter timelines. Provide accurate timelines.</p>
	Lack of clarity about program requirements.	Provide clear communications products with FAQs. Establish an online/call support helpline to address customer queries.
	Privacy concerns for public availability of home energy rating.	Clarify that only the home address, energy rating score and square footage of the home will be displayed (much like data already provided on real estate listings). Information about homeowner's profile and occupancy details will be secure.
Low-Income Homeowners	Requiring payment for assessments out of pocket.	<p>Offer free labelling for income-eligible homeowners. Provide a list of labelling and retrofit incentives</p> <p>Explain that labels are useful for consumers in understanding the full energy cost of owning or renting a home.</p>
Home Energy Assessors & Renovation Contractors	Ambiguity in labelling requirements and potential retrofits.	Provide clear communication products and ongoing training sessions to clarify concerns.

Key Actors

Real Estate Professionals

Partnering with real estate professionals is critical to advancing successful HERD initiatives. During a property transaction, they can provide crucial HERD program information to potential buyers and sellers. Jurisdictions seeking to implement HERD programs can partner with the local real estate community to encourage homeowners to engage in the process. As realtors are often the first point of contact a potential home buyer/seller has, realtors can convey the improved comfort and reduced energy costs homeowners can experience should they implement energy efficiency upgrades.

Listing and buying agents may require specific information from a home energy audit report. For instance, a listing agent will want to showcase a home's energy efficiency and upgrades while a buyer's agent may need access to annual energy consumption estimates to share with their client. An appraiser may be interested in assessing a home's valuation after the energy upgrades while home inspectors and mortgage lenders may be interested in a home's energy report to get an overview of the property's condition. Jurisdictions enabling home energy programs must provide tailored presentations and informational pieces to each of these audiences to drive program uptake.

“Partnering with real estate professionals is critical to advancing successful HERD initiatives.”

Homeowners

Homeowners are the main drivers of energy labelling programs. Through home energy labelling, homeowners become well informed about the energy performance of their homes and ways to improve it. Homeowners also become better equipped to understand their home's environmental impact and manage their energy costs. Through energy audits and unbiased retrofit recommendations from an energy advisor, homeowners can improve a home's performance by enhancing comfort, reducing noise, and controlling moisture.

Home Buyers

Before purchasing a new home, home buyers can inquire about a home's energy efficiency. When enough home buyers request energy efficiency information, this leads to market transformation. Home energy labelling will make it easier for home buyers to obtain this information.

Energy Auditors

Energy auditors help owners understand the systems in their homes and their current operating status. Auditors assist in documenting home improvements to reduce energy consumption and costs. They also provide a list of potential upgrades and the savings and costs associated with implementing them. Jurisdictions advancing home energy labelling programs must ensure the availability of professionally trained energy auditors to meet the energy audit demands from homeowners.

Renovation Contractors and Tradespeople

Renovation contractors guide their clients on energy efficiency before planning their home renovation projects. Professional renovation contractors can review the home energy audit report, advise homeowners to incorporate energy efficiency upgrades in their renovation projects, and point out the features, costs and benefits associated with the upgrades. Jurisdictions advancing HERD programs can develop and conduct training programs for renovation contractors and tradespeople, educating them about energy efficiency audits, upgrades, and available incentives. Trained renovation contractors and tradespeople can guide homeowners with options to renovate their homes and increase their energy efficiency.

Non-Profits

Jurisdictions advancing HERD programs can collaborate with non-profit organizations to develop and deliver awareness and training programs for their community-members, auditors, contractors and other tradespeople. Non-profits are nimble and can respond quickly to the evolving needs of developing and delivering training programs. Non-profits often have closer ties to the communities they serve and are well positioned to deliver awareness programs, or to play an energy concierge roll in those communities. Non-profits can also seek funding from a variety of sources for program capitalization. Many

Canadian affordable housing rental programs are currently operated by non-profits. Jurisdictions implementing HERD programs can partner with these organizations to conduct home energy audits and efficiency upgrades in low-income homes to increase comfort and efficiency while reducing operating costs for tenants.

Utilities

Utility partnerships and incentives are key to advancing home HERD programs. Most community members are utility customers. Utilities are therefore well placed to promote energy efficiency by identifying and deploying incentives for their clients. Energy utilities have access to capital which puts them in a strong position to fund large-scale and long-term energy efficiency programs. Long-term utility-funded incentive programs build an efficient supply chain for quickly deploying home energy efficiency upgrades. Utilities can use home energy efficiency information to project the future energy needs of a community and plan a socially inclusive, decarbonized, and modern energy system.

Natural Resources Canada (NRCan)


In 1988 Natural Resources Canada (NRCan) developed the EnerGuide Rating System, a voluntary home energy labelling program. The Canadian Government has intermittently offered rebates to homeowners to implement measures recommended in preliminary audits, with the final label presented after the second audit is performed. To advance the EnerGuide home labelling program, NRCan provide assessment tools, training programs for auditors, marketing resources, and technical support to public, private and voluntary sector delivery agents. Many provinces and local governments are providing additional incentives to residents to improve the uptake of EnerGuide home energy audits.



Section 3

Consumer Preference for HERD





An energy efficiency score embedded in real estate listings acts as a single piece of information conveying helpful insights about the property, including the expected cost of running a home, the environmental impact of the home and how comfortable the home is likely to be.

A 2017 [study conducted by the Rocky Mountain Institute](#) (RMI) found that several American real estate platforms have started including energy information in their listings, which is significant in increasing the transparency of energy use during the home buying process. This also spurs energy efficiency improvements which benefits utility efficiency programs, contractors, and those that access these programs.

The Consumers Council of Canada noted a shift in consumer appetite for additional knowledge about home energy use. Their [national consumer survey](#) conducted in 2019 revealed that 92% of respondents would prefer access to a home energy rating if they were in the market to purchase a residence. Most respondents indicated that a home's energy consumption and the condition of heating and air conditioning equipment are top factors to consider

when purchasing a home, along with location and price. During a focus group conducted by the Consumers Council of Canada, participants indicated that they were in favour of having a home's energy rating on the MLS website and requiring home sellers to disclose the energy performance of their residence to buyers.

A [2020 study](#) by the American Council for an Energy-Efficient Economy (ACEEE) surveyed 1,500 potential homebuyers using a mock real estate website with home listings, some of which included home energy efficiency scores. The study found that the respondents who were shown energy efficiency scores were 14% more likely to click on the most energy-efficient option and 23% less likely to click the least energy-efficient option, compared with those who were not shown the scores.

Another [study by ACEEE](#) in 2022 conducted a renter survey in the United States using mock real estate listings to test renter preference for energy efficiency information in listings. The study found that renters preferred energy efficient listings, indicating that mandatory energy efficiency disclosure policies could help tenants find housing with lower energy costs while encouraging landlords and building owners to make energy-saving improvements.

[A 2020 ENERGY STAR® and EnerGuide Labelling Awareness Survey](#) by NRCan in Canada found that when provided with a description of the benefits of an ENERGY STAR certified home, a clear majority (71%) of survey participants agreed that an ENERGY STAR certified home offered better value than a home without the certification. Further, the survey indicated that most Canadians (63%) would purchase an ENERGY STAR-certified home if it cost \$5,000 more than a home not certified. However, this proportion dropped to 37% when the cost of purchasing an efficient home increased by \$15,000.

How Consumers Interpret Efficiency Labelling

[A study conducted by ACEEE](#) in 2022 examining the effect of energy efficiency labelling on a mock rental website found that participants responded better to efficiency

information when presented with additional context, such as an energy rating along a continuum or as a rating out of 10. The intuitive scoring system helped renters understand how prospective units compare to the most efficient and least efficient homes listed and proved to be more effective than showing this information without any context.

European Union (EU) studies revealed that consumers had better clarity with information when it was presented on discrete rating scales instead of a continuous rating scale.

In a 2011 German survey, over 3,000 respondents reported they faced challenges in understanding the energy efficiency rating of their home as shown on their Energy Performance Certificates (EPC). Germany's EPC had a continuous scale indicating the energy rating of a building, while all other countries surveyed had labels displaying discrete rating scales, with alphabetical ratings from A-G ([Backhaus, Tigchelaar and de Best-Waldhober, 2011](#)).

Multiple studies conducted in the EU on EPCs for consumer products reveal that consumers widely understand and correctly interpret alphabetical scales. Moreover, these scales help consumers effectively compare the energy efficiency of different products (London Economics 2014).

A study completed by London Economics in 2014 tested five different energy labels using a range of scales including:

- Closed alphabetic scale (e.g., A-G)
- Closed numeric scale (e.g., 30-100)
- Open numeric scale (0-110 with 0-30 and 100-110 being grey)
- Closed numeric scale with a benchmark marker showing the current best available technology
- Closed ended reserved numeric scale (e.g., 7-1 with 7 being better than 1)

The study asked participants which product was more energy efficient using alphabetic closed, numeric closed, and reverse numeric closed scale labels. The study found that the alphabetic closed scale label had the highest

proportion of participants able to identify the most energy efficient product correctly.

A high proportion of participants could also correctly identify the meaning of the benchmark marker without an explanation. Additionally, the study found that even with an explanation, over a third of participants could not correctly understand the meaning of the open-ended scale. Therefore, this is not the best way to display an energy rating.

The energy label design with the highest proportion of participants purchasing more energy efficient products was the alphabetic closed scale label. Participants were also more willing to pay a premium for energy efficient products when using the alphabetic scale compared to the numeric. Through these studies, it can be determined that understanding among consumers is highest with alphabetic labels.



CAP 2022 National HERD Survey

In June 2022, Clean Air Partnership surveyed 1,005 Canadian adults who were either considering renovations to their home or were seeking to purchase a home in the next 12 months.

Participants were asked several questions regarding their perceptions of home energy efficiency and home energy evaluations, their ease of understanding when comparing energy labels, and the information most valuable to them on an energy label. The sample was representative of the Canadian population for age, gender, income, region and tenure status (i.e., if the respondent owned or rented their home). The margin of error was +/- 3.1%, 19 times out of 20.

Importance of Energy Efficiency

Most survey participants (96%) consider home energy efficiency important. Labels are also viewed as helpful for customers in understanding approximate home operating costs. No significant differences were observed in the data based on gender, region, income, or whether homeowners or renters were responding.

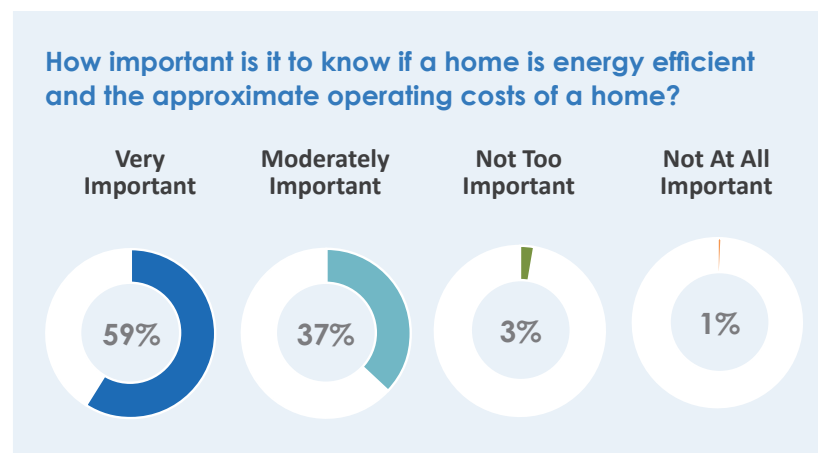


Figure 7 - Key survey findings

Key Findings



96%

think it's important to know if a home is energy efficient.

84%

believe mandatory disclosure of a home's energy rating will influence its price.



< 75%

are willing to pay a premium for an energy-efficient home.

A

B

C

D

E

F

G



70% are willing to pay up to \$500 for an energy audit.



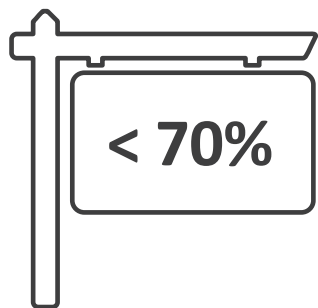
< 57% would prefer an on-site evaluation by a certified energy advisor.

66%

would complete an energy audit to reduce their energy bills.

< 80%

are willing to get an energy audit for their homes.



agreed that home energy-efficiency audits and labelling should be tied to the time of sale or lease of the house.

< 60%

wanted information on energy loss in their home and recommendations for energy savings through an assessment.

94%

prefer energy performance information upfront on the listing or during their initial home visit.



Key Characteristics of an Efficient Home

When asked what comes to mind when hearing that a home is energy efficient, most participants mentioned energy-efficient equipment and high-quality, efficient doors and windows which lead to lower home energy consumption and utility bills. This information helps us understand community priorities when designing efficiency programs and understanding the home improvements they would target first to lower their home energy consumption.

Differences were observed in perception of an efficient home based on age and tenure status, where older homeowners emphasized lower energy and utility bills and use of efficient equipment more when compared to younger respondents. Similarly, homeowners placed a greater emphasis on these as compared to renters. Little difference was observed based on age, location or tenure status around relating energy efficiency to reducing emissions that cause climate change. For complete data, see Appendix B.

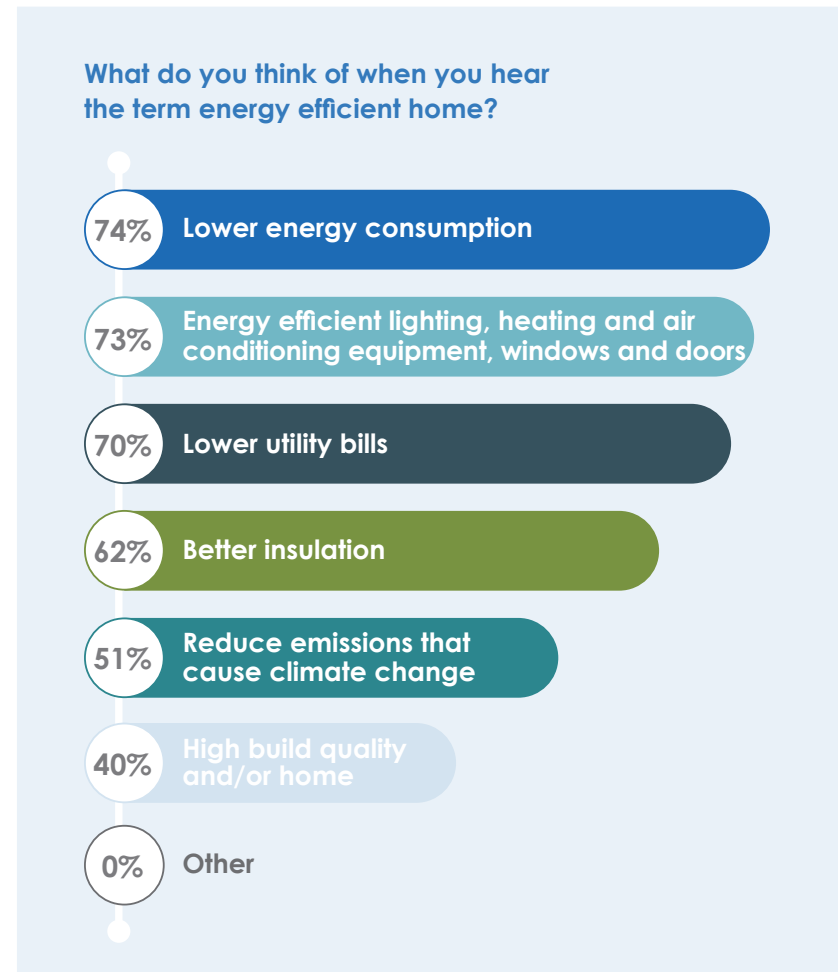


Figure 8 - Perceived characteristics of an efficient home

Energy Efficiency and Home Values

Regarding the perception of the relationship between home prices and property energy efficiency disclosure, most respondents (84%) believed a home's price would be affected by requiring its sellers to disclose the home's energy rating. Therefore, a higher home energy rating would be an excellent incentive for home sellers to help increase the home's market value. Approximately 11% of respondents felt house prices would not be affected by energy efficiency. No significant differences were observed based on age, location, tenure status or income.

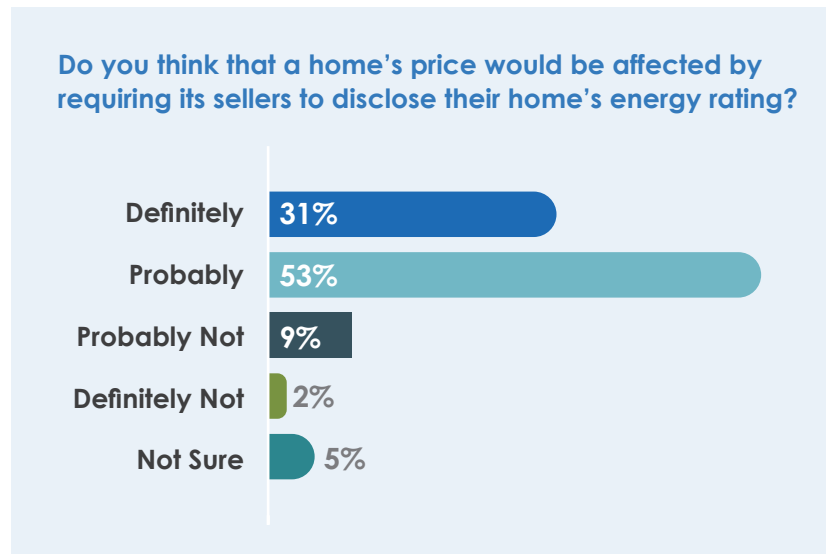


Figure 9 - Energy efficiency and home values

Undertaking Energy Assessment

When asked if respondents would be willing to complete an energy assessment to determine their home's energy efficiency, most respondents showed a willingness to get an energy assessment with a strong preference for an on-site (in-home) evaluation by a certified energy auditor. This response indicates that homeowners prefer a more customized and detailed property assessment to be completed, like the EnerGuide home evaluation and rating, as opposed to inputting utility bill information into an online database to generate a rating. While older respondents interviewed were most supportive of on-site evaluations, 48% of respondents within the 18-30 age group expressed a preference for this method. Respondents within the 18-30 age group expressed the highest desire for online self-assessments (20%) as compared to a low of 10% in the >61 age cohort. More than half of the respondents, regardless of age said they would prefer to pay less than \$250 for a home energy assessment. No significant differences were observed based on location, tenure status or income.

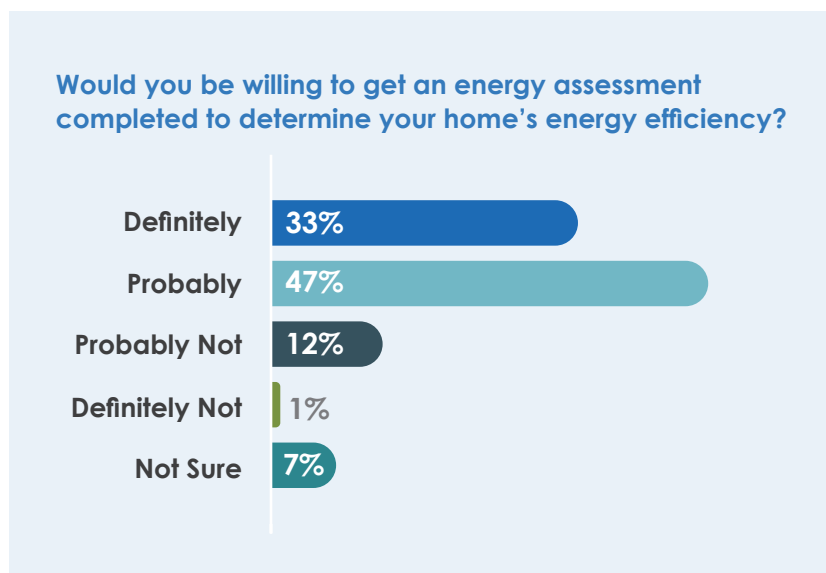


Figure 10 - Willingness to undertake an energy assessment



Figure 11 - Willingness to pay for an energy assessment

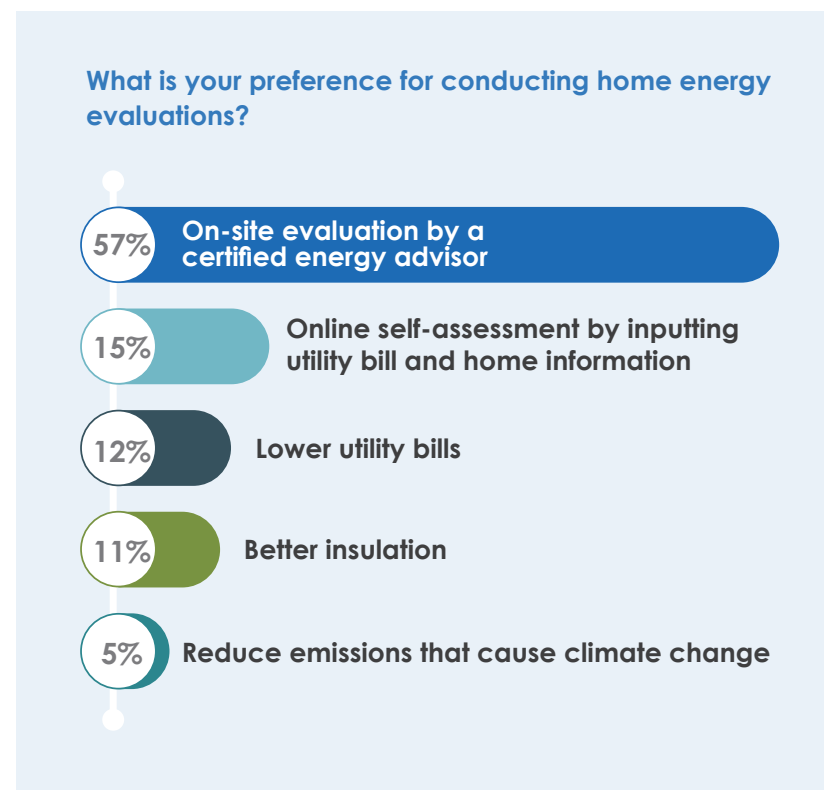


Figure 12 - Energy audit type preference

Energy Assessment Drivers

Delving deeper into why Canadians would choose to have a home energy efficiency evaluation, a substantial preference for cost-savings was observed, with two-thirds of respondents indicating their desire to save money on their utility bills. 38% percent mentioned the desire to increase the value of their property.

40% of respondents indicated they would complete a home energy evaluation to help protect the environment. This shows that Canadian homeowners are motivated by saving money and improving home values but also see themselves playing a role in protecting the environment.

Accordingly, when communicating the benefits of a HERD program, it is best to focus on how the program helps homeowners save money on their energy bills and improves home values while also contributing to the betterment of the environment.

In this question, differences were observed between renters and homeowners, where 70% of homeowners wanted to save money on utility bills versus 59% of renters. Similarly, 43% of homeowners expressed a desire to increase the value of their property, compared to 28% of renters. Note that all renters included in the survey were planning to purchase a home in the next 12 months so they may have responded as perspective homeowners rather than long term renters.

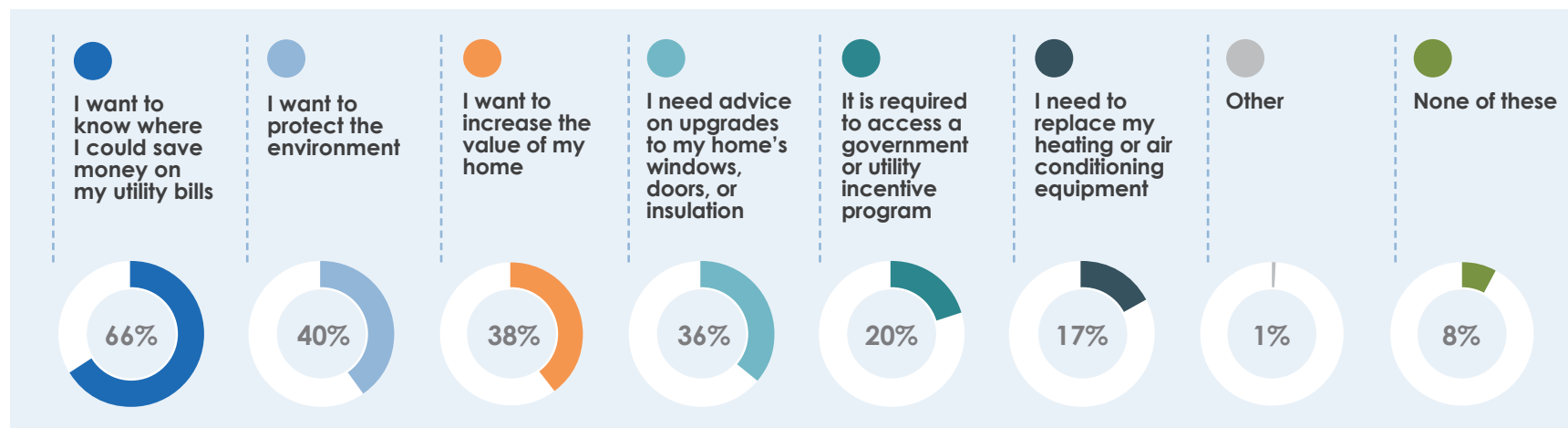


Figure 13 - Drivers for a home energy evaluation

Energy Efficiency Information

When asked specifically what type of information homeowners would like to obtain from their home energy assessment, most respondents stated a preference for three types of information:

- How energy is lost in the home (e.g., doors, windows, insulation, attic, etc.)
- How energy is consumed in the home (e.g., heating and air conditioning systems)
- Recommendations for measures to enhance energy savings

Fewer respondents requested annual energy consumption information, retrofit cost analysis and incentive program information through the assessment. Information explaining how emissions from their homes leads to climate change was least preferred. In this question, older respondents stated a stronger preference for information on how energy is being lost (71% for >61yrs) and recommendations for energy savings (75% for >61yrs) than younger groups (48% and 51% for 18-30yrs). Similarly, owners were more concerned with these elements than renters (65%,64% v 52%,53%).

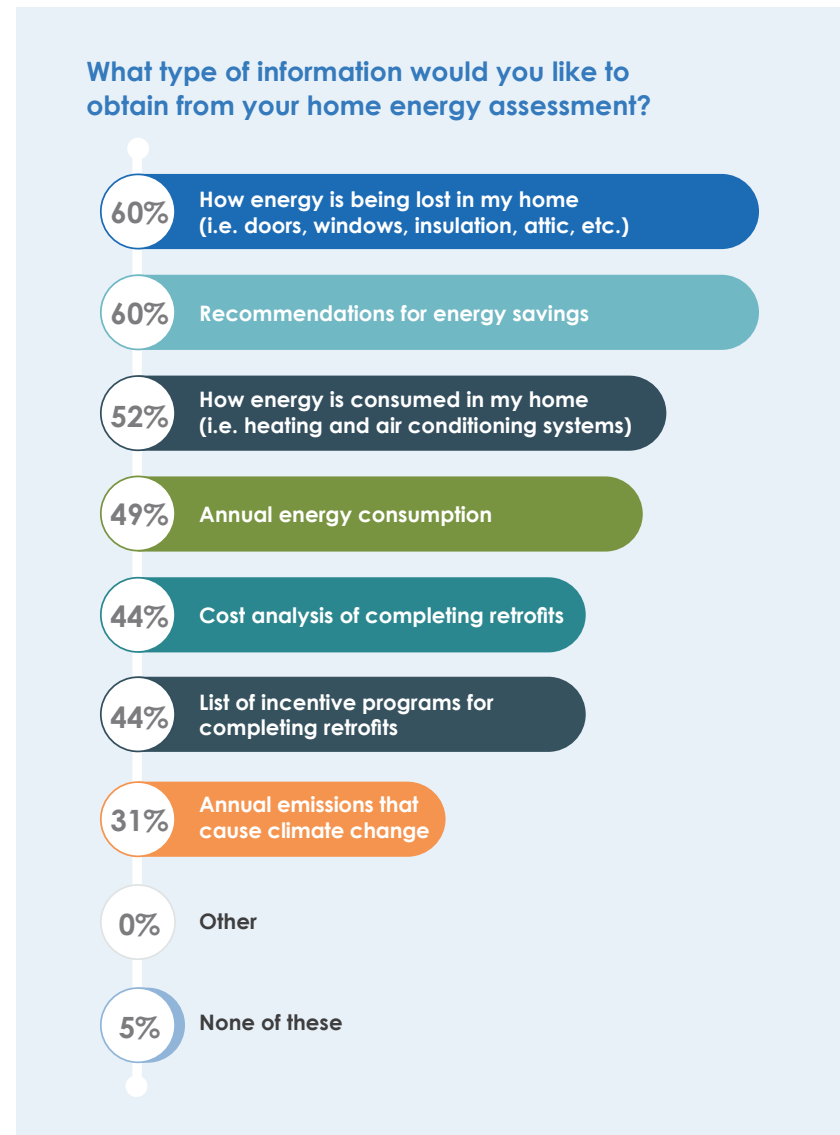


Figure 14 - Desired information in an energy assessment

Label Design Preference and Usefulness

Next, respondents were presented with hypothetical label options displaying energy efficiency information in various formats, including a five-star rating scale, a green to red scale reflecting monthly energy consumption in dollar amounts, green-to-red speedometer-type ratings, A to F letter ratings and the percentage value of home efficiency.

They were asked to pick the most accessible options to determine if a home was energy efficient. For all but two labels, over 50% found the labels moderately easy or very easy to understand. The five-star rating scale was most popular (69%), likely because respondents were familiar with the five-star method of rating home equipment (Energy Star) and other products. The green-to-red speedometer (67%) and green-to-red scale with energy consumption per month in dollars (67%) were selected as the easiest by several participants. Letter grade scoring was found to be very or moderately easy by 57% of respondents, while the least number of respondents (43%) picked the energy efficiency percentage option. The gigajoules per year option also scored low with only 48% of people finding it easily understandable. These results help determine the best way to communicate a home's energy efficiency rating to consumers.

For all hypothetical labels examined, no significant differences were observed based on gender, age, location, or income.

How easy is it to determine if a home is energy efficient with each of the following home energy labels?

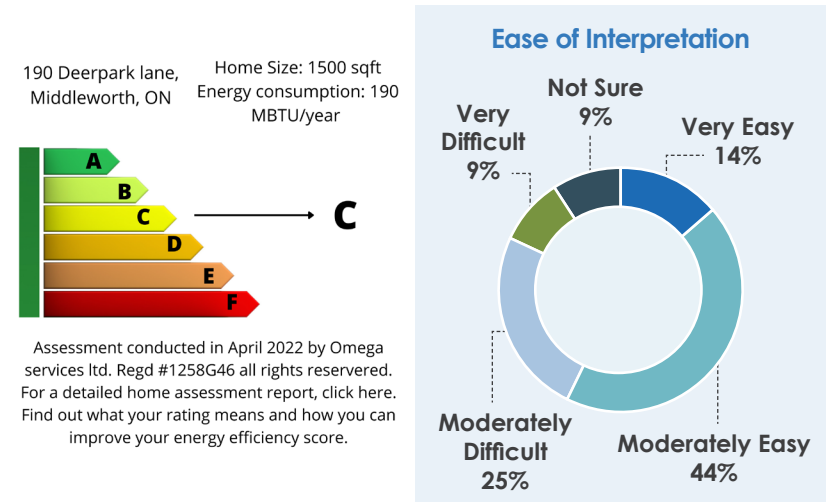


Figure 15 - Ease of understanding for letter grade

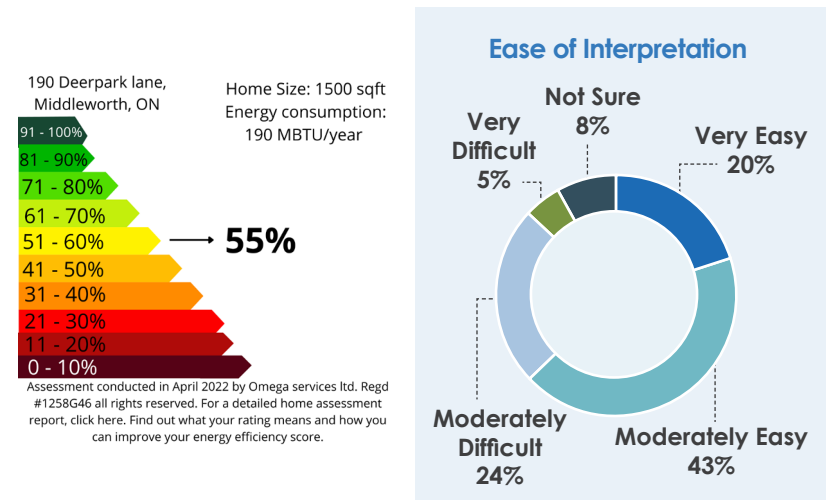


Figure 16 - Ease of understanding for percentage energy score

How easy is it to determine if a home is energy efficient with each of the following home energy labels?

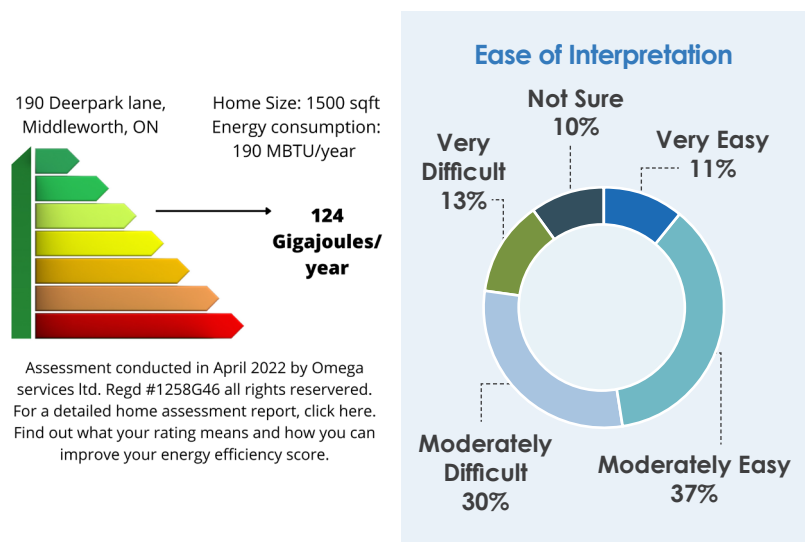


Figure 17 - Ease of understanding for energy use in gigajoules

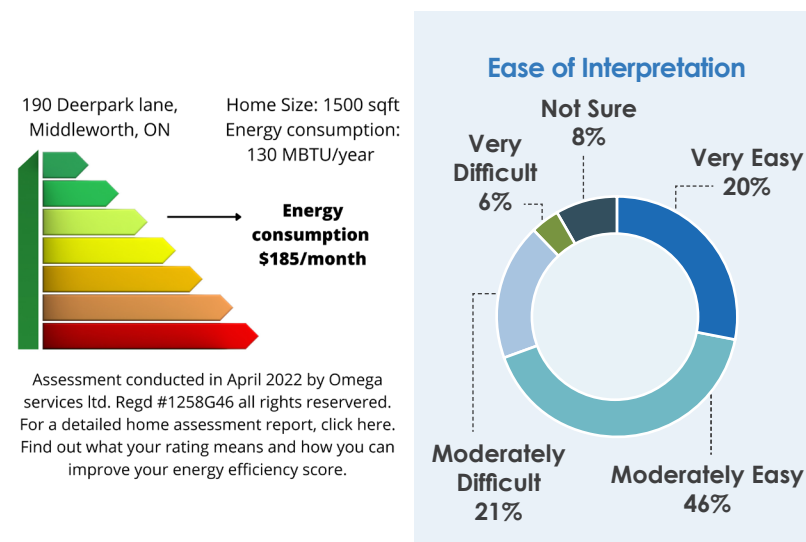


Figure 19 - Ease of understanding for five-star scale

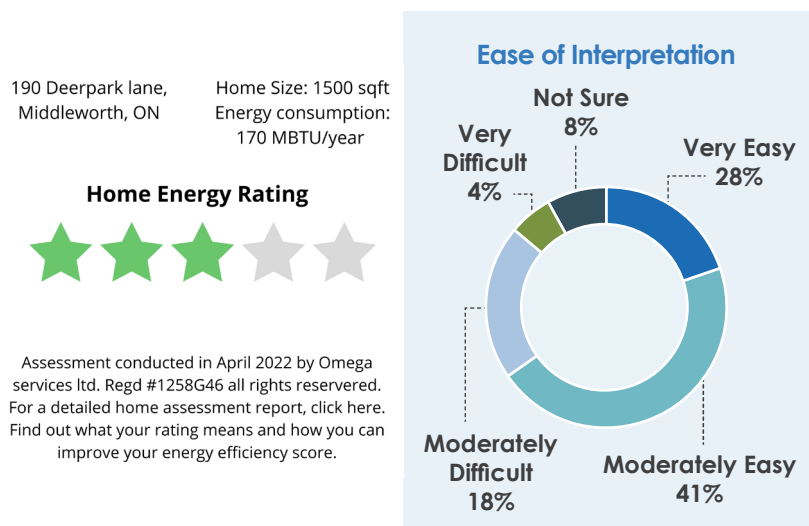


Figure 18 - Ease of understanding for energy cost (\$)

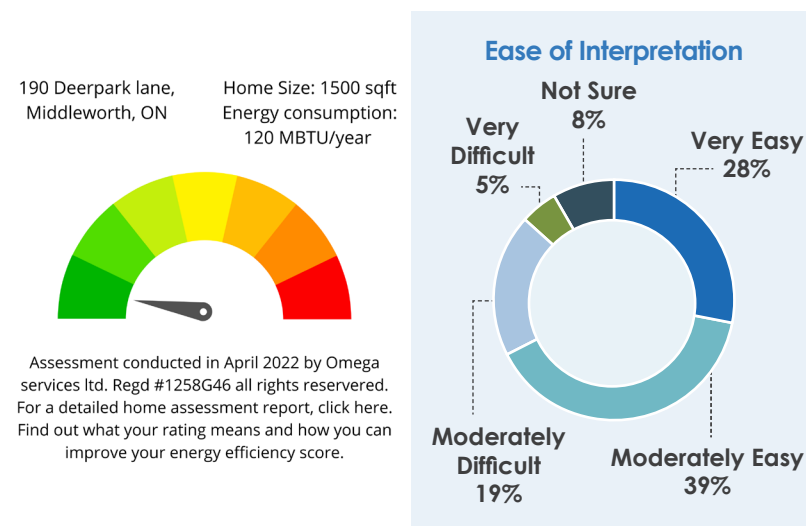


Figure 20 - Ease of understanding for energy speedometer

Respondents were then presented with four current existing energy labels from various jurisdictions - Australia, the European Union, the United States and Canada - and asked to rate the labels by ease of determining a home's energy efficiency. Most respondents selected the Australian label, with a six-star rating and annual energy consumption information in kWh, and the EU label, with an A1-to-G letter scale with annual energy consumption in kWh.

The least preferred was the Canadian EnerGuide label, with information including annual energy consumption in GJ/year and a chart breaking down annual energy consumption from various energy sources. The EnerGuide label also had a breakdown of energy consumption for mechanisms such as space heating and cooling, lighting, appliances, annual GHG emissions and a QR code linked to a homeowner information sheet. The respondents strongly preferred labels

with a straightforward energy rating scale and annual energy consumption information.

This information should be taken into consideration when designing a home energy label. Additionally, a vast majority of participants noted that energy consumption presented as a monthly utility bill estimate in dollars was the easiest to interpret home energy consumption. However – these labels are difficult if not impossible to produce as they cannot truly account for energy price increases over time, and risk becoming inaccurate when energy prices fluctuate. The respondents also preferred ordinal scales such as a 10-point rating scale or an A to G letter grade rating as units used to reflect a home's energy consumption, rather than units of energy. For all existing labels examined, few significant differences in responses were observed based on gender, age, location, or income.

The respondents strongly preferred labels with a straightforward energy rating scale and annual energy consumption information.

How easy is it to determine if a home is energy efficient with each of the following home energy labels?

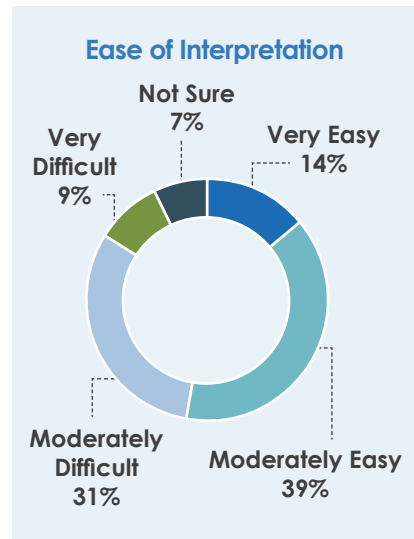
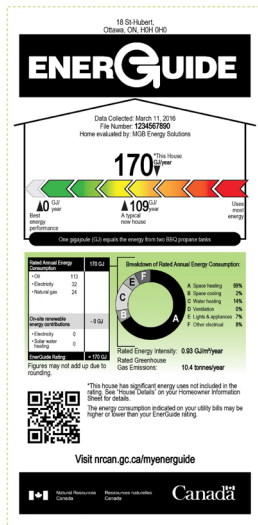
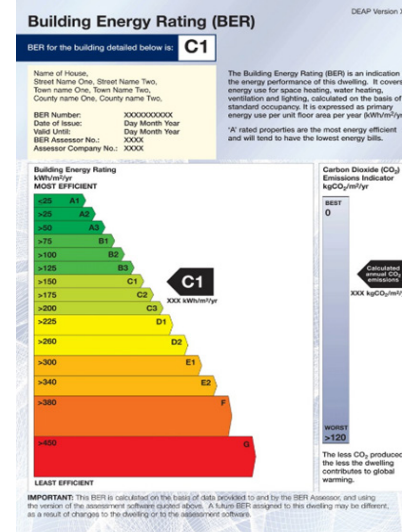


Figure 21 - Ease of understanding for EnerGuide Label (Canada)



Utility of Information Included

When asked what information would be most useful on a home energy label, more than half of respondents identified three types of information:

- Energy consumption per year
- Breakdown of energy consumption
- Green to red colour scale

What information is useful from these energy label examples?

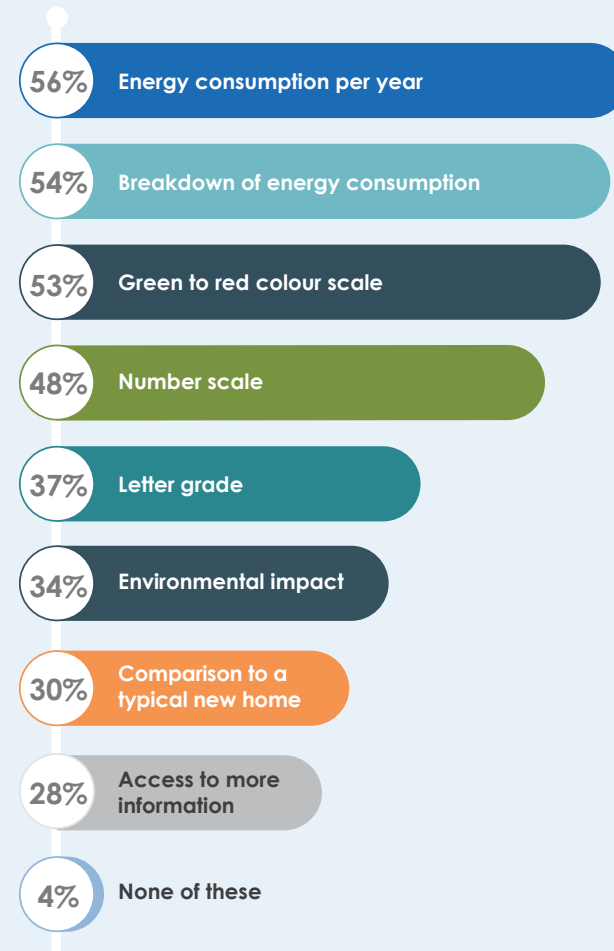


Figure 25 - Usefulness of information on labels

Units of Measurement

Regarding units of measurement presented on energy labels, respondents stated a strong preference for utility bill estimates in dollars, 10-point rating, and letter grades. Units of measurement relating to energy (kWh & GJ) were less understood by respondents and were therefore less preferable.

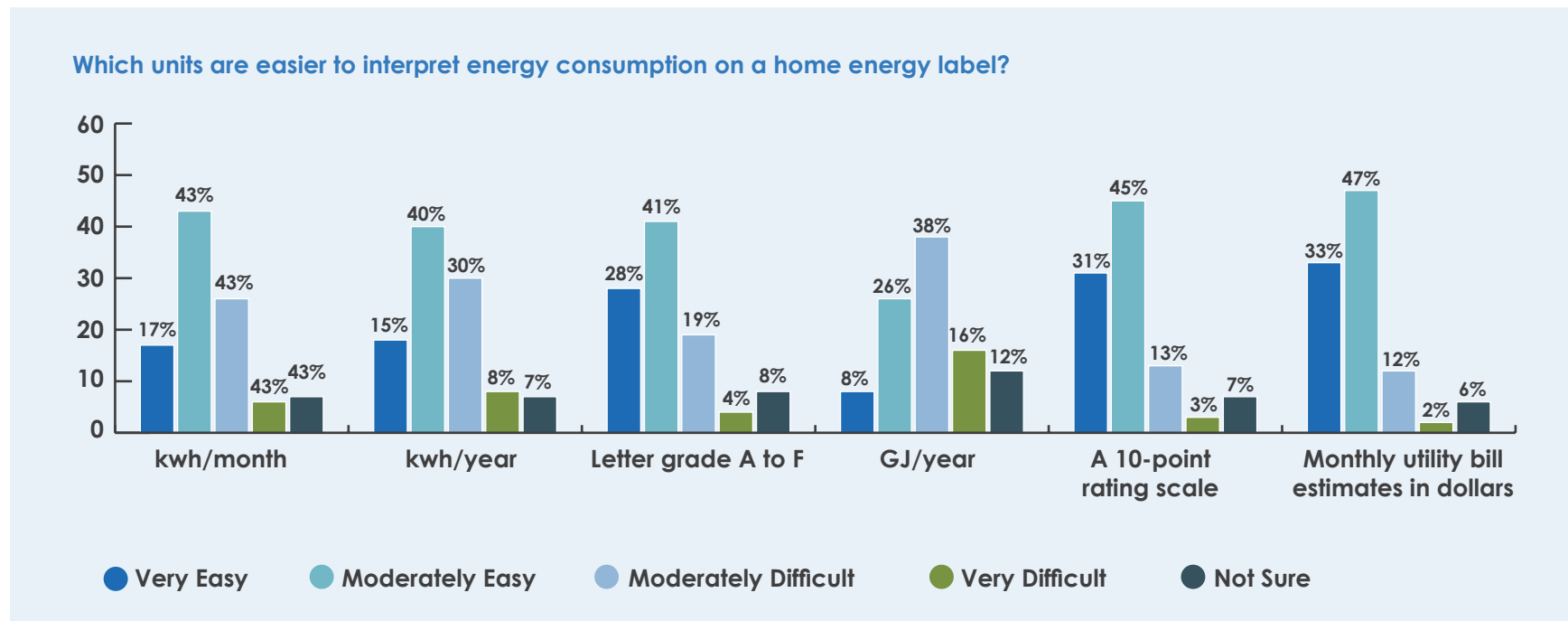


Figure 26 - Preferred units of measurement

Energy Assessment Timing

When asked if a home energy efficiency evaluation and labelling process should tie in with the time of sale/lease of a house, three-quarters of respondents favoured the idea. Those respondents were then asked when they would prefer to get energy efficiency information during the real estate transaction. Over half said they would prefer to have the energy efficiency information upfront on real estate listing websites with other home features. This would allow homeowners to easily compare homes on the listing website itself during their initial property search.

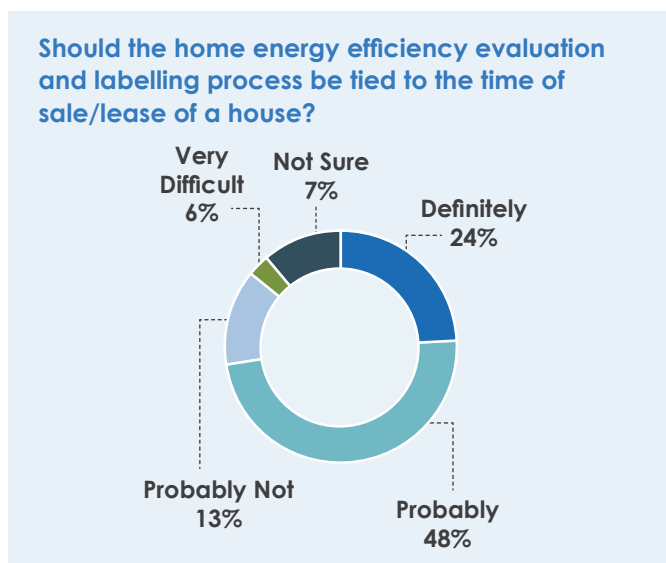


Figure 27 - Preference to tie energy disclosure to sale/lease of home

Willingness to Pay an Efficiency Premium

When asked if respondents would be willing to pay extra money for an energy-efficient home, over two-thirds were inclined to pay up to a 5% premium for energy-efficient properties. This result indicates that homeowners understand the benefits of an energy-efficient house with higher quality upgrades and are willing to pay more to purchase a home that will save them money on their utility bills.



Figure 28 - When would you prefer to receive energy efficiency information during the real estate transaction

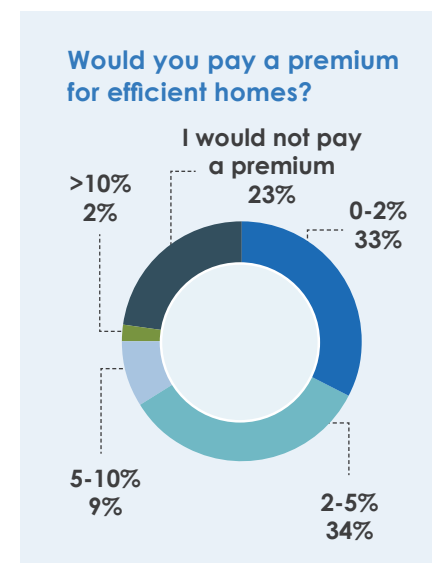



Figure 29 - Premium respondents are willing to pay for an energy efficient home

Section 4 Program Design Considerations





There are a range of program design elements to be considered when designing a HERD program. Considerable variation exists in design between pilot programs and programs developed at scale. This section presents key program design considerations for both pilots and programs developed at scale.

Eligibility

Residential Housing Stock Considerations

7.9 million of Canada's residential buildings are single family homes. There are approximately 4.3 million housing units in apartment buildings, and 0.8 million duplex apartments (Statistics Canada, 2022). To achieve widespread adoption of energy efficiency in Canada's large housing market, a framework for HERD must be carefully considered and designed.

Single-detached, semi-detached, rowhouses, townhouses, duplex and triplex homes stock and have a significant potential for energy efficiency improvements. The energy assessment for these homes is less complex when

compared to multi-unit or mixed-use buildings. Decisions to undertake energy assessments and upgrades in single-family homes are driven primarily by homeowners themselves. They do not involve participation from other parties such as property managers, strata councils or housing associations. Assessing the energy efficiency of single detached homes is further simplified with single utility connections and relatively uniform energy consumption habits. Access to properties to evaluate physical building characteristics and consent to access utility bill information is also more straightforward.

NRCan's EnerGuide Rating System provides homeowners and buyers with standardized, validated information about the energy efficiency of homes. However, it only applies to homes less than three storeys tall and less than 600m², which are primarily single-family homes, duplexes, triplexes, and row houses. Most other home energy labelling programs are the same, applying only to low-rise residential buildings. Multi-Unit Residential Buildings (MURBs) are generally excluded from North American HERD programs.

For condominiums and certain mixed-use buildings, single unit sales and leases can occur independently. However, assigning an energy efficiency rating may require the energy auditor to have access to all the other units and common building systems. The additional step of getting strata/condominium councils to agree on energy assessment could pose a challenge for a condominium seller. For this reason, initially exempting MURBs from the home energy labelling requirement may be prudent. MURBs can be included in the program at a later date.



Single-detached, semi-detached, rowhouses, townhouses, duplex and triplex homes stock and have a significant potential for energy efficiency improvements.

Timing

Tying home energy labelling requirements to the time of sale of a home helps homebuyers better understand the operational costs of the property and identify energy efficiency improvements that will lower their energy wastage over the long term. This information increases transparency for home buyers and improves their ability to differentiate between properties. Disclosure of energy consumption information ultimately drives the market to incorporate energy efficiency as a consideration for the value of a property. This leads to an increase in the value and desirability of energy-efficient homes, strengthening the business case for energy efficiency.

Target Audience

The target audience for a HERD program varies based on the type of program a jurisdiction advances. Narrowing the target audience in the early stages helps focus communications for the audience. Depending on the type of program, the target audience could include:

- Homeowners, landlords and property owners of single-family homes (detached, semi-detached, row-houses and townhomes)
- Property owners considering selling their homes
- Property owners considering deep renovations/retrofits
- Potential home buyers
- Developers (where HERD is mandated for new developments)
- Realtors
- Energy Assessors

Energy Assessments

Site vs. Source Assessments

Source energy assessments are the most equitable unit of evaluation for comparing buildings. These assessments calculate the source energy use intensity (EUI), which represents the total amount of raw fuel that is required to operate a house. It incorporates all transmission, delivery and production losses.

Site Energy Assessments calculate a property's site EUI, the amount of heat and electricity consumed by a house as reflected by the utility bills. Looking at the site energy can help owners understand how the energy use for an individual house has changed over time.

Both source and site EUIs are expressed as energy per square foot per year. It can be calculated by dividing the total energy consumed by the building in one year, measured in kBtu or GJ by the total gross floor area of the building (in ft² or m²).

An important point to note is that while the source EUI provides a well-rounded picture of the overall energy consumption of a house including fuel sources, generation, and transmission, it can often leave homeowners confused and demotivated to take steps to increase efficiency of their homes.

A site-based score better addresses the target of a HERD program which is to increase consumer awareness and drive the residential housing market towards energy efficiency through retrofits and consumer behaviour change.

Asset-Based vs. Operational Assessments

Two types of ratings can be used to assess the efficiency of buildings. Asset-based ratings, such as EnerGuide, use home inspections by energy assessors or analysis through computer models to assess how a home will perform under standard operation assumptions. Operational ratings, such as Energy Star Portfolio Manager, use energy consumption data to compare the performance of buildings.

In addition, asset-based ratings can evaluate efficiency independently from user behaviour, allowing the comparison of different homes' actual home energy efficiency. Asset-based ratings enable real estate markets to compare the performance of houses and drive market transformation toward energy efficiency.

In contrast, operational ratings combine both performance of buildings and occupant behaviour. They are more useful for large buildings with complex systems, where building operation and maintenance offer significant opportunities for efficiency gains.

Operational ratings can be useful for marketing energy efficiency and engaging homeowners in energy efficiency campaigns as the rating is highly dependent on occupancy and user behaviour.

Assessment Methods

There are several methods to conduct an energy audit to determine a home's energy efficiency.

- **An in-person energy audit by a certified energy assessor:** Homeowners can request an in-person assessment from a local certified energy assessor. During the assessment, the assessor conducts a

blower door test to measure leakage, a low-emissivity coating check for windows, and thermal scans to detect hot and cold spots in the house. After the assessment, an energy rating is issued to showcase the home's energy performance. An assessor may recommend the next steps to retrofit components of the home to make them more efficient.

- **Virtual audit:** A virtual home energy audit is conducted by a home energy expert online by consulting with homeowners through a phone or a video call. A virtual audit can help homeowners identify any issues or concerns solved by completing home energy improvements. The energy expert will provide recommendations, possibly including an in-person home evaluation, advice on connecting with a contractor, directions to available rebate programs for specific support, and provide other information on how to best proceed with home energy improvement.
- **Remotely sensed home energy labels:** Remotely sensed labels use a combination of geospatial modelling, behind-the-meter housing data, and local energy consumption and behavioural economics to generate energy labels for homes.

Through Clean Air Partnership's national survey, most homeowners strongly preferred an in-home assessment to obtain energy efficiency information. In-home assessments can provide homeowners with up-to-date information about their building envelope, air tightness, and HVAC equipment while providing recommendations to improve energy efficiency.

However, in-home energy audits can take longer during periods of excessive demand. The Canadian real estate market is cyclical, with residential home listings reaching their peak typically in May and hitting their low in December. Fluctuations in this cycle can mean longer wait times for audits during peak season, and limited work for auditors in the off-season.

A potential solution could be to use virtual or remotely sensed home energy audits to fulfil time of sale labelling requirements. Virtual or remotely sensed audits are relatively cheaper, faster to obtain and can provide basic efficiency information to homeowners. These can then be verified with an in-home audit later, avoiding seasonal capacity issues.

Individual jurisdictions must decide if HERD programs will entail in-home, virtual or remotely sensed assessments, as there are advantages and disadvantages to both options. Jurisdictions must assess the suitability of each option for their program.

Through Clean Air Partnership's national survey, most homeowners strongly preferred an in-home assessment to obtain energy efficiency information.

Program Financing

Program Costs

Program costs are incurred to the regulating jurisdiction through program administration and possibly the provision of financial incentives. The assessment factors include the complexity of program development and administration, program delivery costs, direct costs to homeowners, and, where applicable, the cost of incentives. The program costs also include administrative costs to maintain the assessment software, hardware, and advisor network, and costs to analyze data and develop results and reports.

Energy Assessment Costs

Where a jurisdiction implements a labelling program with in-home assessment, energy auditors must be consulted to determine assessment costs. EnerGuide home assessments currently cost approximately \$350 – \$400 for existing homes and \$700 - \$800 for new homes. Some programs may require post-retrofit evaluation at an additional cost. Where pre- and post-assessments

are required, financial incentives are important to keep home-owner costs down. High assessment costs can severely impact program uptake. Where possible, provide incentives to homeowners, particularly lower-income and marginalized groups to cover energy assessment costs.

Costs of Incentives and Financing

Incentives are critical to HERD uptake and advancement of subsequent home retrofits. Ensuring the availability of incentives enables homeowners from all income groups to engage in the HERD process and enjoy the benefits of energy efficiency upgrades. Retrofit incentives and financing provide avenues for homeowners and realtors to address how homes with lower energy ratings could be improved, at low or no cost. Appropriate financing tools should, therefore, be in place before implementing a program for labelling homes.

Incentives and financing can be developed through two approaches:

Partnership: Prioritize partnerships with other jurisdictions, utilities, and levels of government through the following actions:

- Create an incentive program which is a “top-up” incentive designed to work with existing programs
- Contact the local utilities and explore opportunities for utilities to supplement existing rebates and incentives
- Provide rebates and incentives to homeowners to recover the cost of hiring their own energy advisors to obtain a home energy assessment and label
- Champion the creation of a Province-wide incentive program to reduce the cost of obtaining an EnerGuide label, which includes a request for disclosure
- Design an incentive program ‘package’, i.e., incentive program terms and conditions, waivers, forms, etc., which can be tailored to any jurisdiction and act as a catalyst for other jurisdictions to launch incentive programs to encourage home energy labelling
- Examine use of financing through local improvement charges for upgrades

Leadership by provincial or regional governments:

If the province or region centralizes efforts to bring an offer to the market, it can do so through the following actions:

- Design a standalone incentive program to reduce the cost of obtaining an EnerGuide label
- Contract energy assessors to seek a bulk price to increase the cost-effectiveness of offering home energy assessments
- Design a program which incentivizes consumer actions that are priorities for the region. For example, the public disclosure of EnerGuide ratings
- Design a provincial/regional incentive program, and encourage municipalities to offer top-ups reflecting local priorities
- Examine use of financing through local improvement charges for upgrades

Program Funding

Funding is crucial to successful HERD program delivery and significantly influences the program uptake in the community. Funding availability influences the quality and longevity of a HERD program. Incentives can amplify the uptake of energy labelling and subsequent renovations. Jurisdictions can:

- Apply for funding to develop a HERD program
- Partner with utilities to develop incentives for labelling and retrofits
- Partner with local lenders to take advantage of available financing
- Research federal, provincial, and local energy efficiency financing opportunities, and other incentives
- Natural Resources Canada (NRCan) maintains a list of financial incentives available in each province and territory.



Energy Labels

A comparative label (e.g., EnerGuide) provides information on a home's energy ranking in contrast with similar local homes. An endorsement label certifies homes that fulfill the criteria of a specific energy standard (e.g., Energy Star or Passive House).

To ensure consistent residential energy-efficiency information is conveyed effectively to the market, the following best practices for labels can be used while developing label design:

Avoid technical jargon on labels Integrate a scale or index of applicable scoring systems Translate label text into multiple languages and adjust for local literacy levels Customize energy improvement recommendations to support the jurisdiction's energy reduction goals.

The selection of metrics, scores and scales in a home energy label is crucial to present home energy information in a meaningful, motivational manner to consumers.

The primary goal of a label is to:

- Assist homeowners in understanding the score's meaning in terms of energy efficiency
- Support owners in evaluating how their home compares to other homes
- Inform home purchasing decisions
- Motivate homeowners to reduce energy consumption and emissions

The scores on a label can be presented in an “absolute” fashion, indicating the actual energy consumption per square meter per year (GJ/m²) or a “normalized” fashion

considering the square footage of the home (GJ/m²/year). The scores can be converted into a scale of A-F, 1-10 or a red to green colour scale for easy understanding.

The latest version of the EnerGuide label provides homeowners with a consumption-based rating measured in gigajoules per year (GJ/year). The gigajoules per year consumption rating gives homeowners a score using units of energy, like the consumption rating of kilowatt hours per year for home appliances and litres per 100km for vehicles. Supplementary information provided on an EnerGuide label includes a table and a chart with a breakdown of annual energy consumption by various energy sources and the most significant energy uses in a home.

In the UK, the Energy Performance Certificate (EPC) ratings use a scale from A-G, showing the energy efficiency of a home, along with the potential scale after improvements are made, with 'A' indicating the most efficient home. Higher-rated homes have less environmental impact. The EPC displays the amount of CO₂ produced by that property in tonnes and suggests how this could be reduced. The average property in the UK is in bands D-E for both ratings. EPCs also apply to commercial buildings and are rated only by emissions on a scale of A-G.

The primary score should be complemented by additional metrics such as the carbon footprint, annual energy costs and potential cost savings. Incorporating these metrics into labels provides a well-rounded picture of energy efficiency impacts on homeowners. A jurisdiction can select the supplementary data to add to the label through stakeholder consultation.

Furthermore, the presentation of information plays a crucial role in the consumer's interest in the label and their motivation to take steps to increase the efficiency of their home. The CAP national survey found that consumers preferred simple metrics such as star ratings, letter grades and a green to red speedometer-style rating indicating their home's energy efficiency. Most respondents also preferred energy consumption information demonstrated through utility bill costs. Consequently, the study found that presenting utility bill costs on energy labels adds a level of complexity because of dramatically fluctuating energy prices which affects the relevance of the label, even over a relatively short term.

As homeowners undertake retrofits, scores should be responsive to the retrofit improvements. The rating buckets in an energy label should reflect market improvements becoming more stringent over time, where in more mature energy efficiency markets, a greater efficiency level is required to achieve a high rating.

Energy Assessor Database

Energy assessors are third-party consultants registered by service organizations and are licensed by government agencies such as Natural Resources Canada.

Energy assessors conduct in-home or virtual testing to provide home energy efficiency information. The availability of energy assessors in a jurisdiction is crucial to meeting assessment and labelling demands. Moreover, a key component of a labelling program is developing an online energy assessor database and providing it to homeowners to search and connect with local assessors. The database can have tools to narrow searches geographically by postal codes and by types of assessment (in-home or virtual). In sum:

- Connect with certified energy assessors in the jurisdiction and ensure they meet the certification criteria
- Develop an online database of assessors with search functions and make it available to homeowners with other program information

Program Administration

Each jurisdiction must assess their own staff capacity to administer HERD programs. If the jurisdiction has existing staff capacity and expertise to develop and administer the labelling program, a core project team must be created. In addition, a team of experts should be assembled and periodically consulted to provide guidance at key project stages. Reporting and evaluation frameworks and timelines must be developed to ensure regular project updates.

Jurisdictions can also develop Home Energy Labelling programs collaboratively, sharing human and financial resources and responsibilities (e.g., staff, expert groups, IT infrastructure, etc.). Governments can also contract program administration to a third party.

Software and I.T.

Infrastructure Development

IT infrastructure must be developed to create consistent, publicly accessible scoring information, including an energy label generation system that creates and delivers customized energy label through certified assessors in real time.

Should jurisdictions decide to make scores visible to the public through a map or a Multiple Listing Services (MLS) listing, it is important to develop a portal providing public mapping through a database of home energy scores and, or linkage to MLS and other real estate listing websites.

A centralized telephone support line can also be set up to answer HERD program questions from the public, energy assessors and real estate professionals. Supposing multiple jurisdictions collaboratively advance a HERD program, this role can be led by a single IT team to reduce administrative burden, especially in smaller jurisdictions where administrative capacity can be limited.

Database of Scores

Displaying energy labels publicly on maps, MLS listings or realtor sites can help increase energy efficiency visibility in the market. A database of all labels generated in a jurisdiction can be pooled together to develop an interactive map with information about the year of construction, square footage of the home and energy efficiency scores. Where scores are displayed on MLS listings, an IT framework must be developed to upload scores to the listing websites. Incentives can also be provided to encourage homeowners to display their energy scores. Edmonton's [Change Homes for Climate](#) platform displays thousands of home energy labels across the city to make energy efficiency more visible in the community.

Program Model

Many Canadian jurisdictions are advancing HERD programs using various program models. Jurisdictions must predetermine appropriate program model to advance labelling within their boundaries. Program models can include:

- Using the federal EnerGuide system Develop a new labelling program Using a pre-existing 3rd party labelling program

In British Columbia, the [BC Energy Step Code](#) is a voluntary compliance path in the BC Building Code where municipalities can incentivize or require a level of energy efficiency in new construction that goes above and beyond the requirements of the province's building code. For Part 9 buildings (mostly residential buildings with 3 storeys or less and a building area less than 600m²), local governments of the District of Saanich, City of Surrey, City of Richmond, City of New Westminster, City of Kimberley, and the District of Sparwood are supplementing the code with an EnerGuide energy labelling requirement. As of

Spring 2019, communities that have adopted a home energy labelling requirement or incentive collectively represent 28.5% of building permits issued for Part 9 homes in 2018.

The City of Edmonton in Alberta has showcased several leading practices when it comes to advancing municipal level HERD programs. The city is currently using the EnerGuide program and is developing a program to create remotely sensed energy labels in collaboration with Calgary. Edmonton's [Change Homes for Climate](#) platform provides homeowners with up-to-date information about the energy labelling process and available rebates. Edmonton's [Home Energy Map](#) displays the energy efficiency of thousands of homes. The City offered [rebates up to \\$400](#) to residents to cover labelling costs. Edmonton has partnered with Calgary and Lightspark Inc. to issue [remotely sensed digital home energy labels](#) to residential properties.

Risks and Risk Mitigation Strategies

Lack of Funding

Jurisdictions may be unable to secure funding for a HERD program. Program development or delivery could go over budget, or jurisdictions are unable to deliver the program within the funding timeframe.

Mitigation strategies:

- Develop partnerships, share program components to cut program costs
- Access funds from higher orders of government or other eligible sources
- Collaborate with non-profit organizations to secure funding

Low Uptake of Voluntary Programs

Jurisdictions may lack marketing capacity, may not be able to reach or appeal to the target audience, or lack incentives. Homeowners may feel the potential savings and benefits are not worth the cost of retrofits.

Mitigation strategies:

- Develop a well-rounded communication and marketing strategy with communications experts early on
- Use simple, straight-forward communications products tailored for various target audiences. Provide communications materials in multiple languages
- Ensure ongoing communications throughout the project using various offline and online platforms

- Incorporate the costs of incentives into the funding application or apply for separate funding to incentivize labelling. Provide homeowners with a list of available incentives and financing to reduce retrofit costs
- Channel communications using appropriate streams to reach the target audience. Involve NGOs and communications agencies to engage stakeholders in disseminating information
- Prime local leaders to deliver webinars, event promotions and share local success stories

Hesitancy Displaying Labels

Parties may be hesitant to display scores (especially lower scores) as it might negatively affect the price of the home, causing the home to be perceived as outdated, or other privacy concerns.

Mitigation strategies:

- Develop communications materials explaining the connection between older home systems, non-retrofitted home systems and poor insulation with lower energy efficiency.
- Provide retrofit solutions to raise a home's energy efficiency
- Provide comparative home energy-efficiency data for similar homes in their neighbourhood

Non-Compliance with Mandatory Labelling Requirements

Mandatory labelling non-compliance may occur due to uncertainty surrounding labelling requirements (e.g., eligibility, timelines, time of sale, enforcement, etc.), lack of ability to enforce this requirement by the jurisdiction, or inadequate penalties and fines to enforce labelling.

Mitigation strategies:

Detail program eligibility requirements clearly, outlining the target home archetypes (single-family detached, semi-detached, row, townhomes, multi-family buildings), ownership (landlord, leasing agencies, etc.), period of construction and point of sale labelling requirements

- Begin communicating early about mandatory requirements and implementation timelines. Provide lengthy notice periods before the requirements are mandatory
- Develop communications products for the real estate community informing them about the requirements
- Develop a comprehensive enforcement framework. If possible, collaborate with other jurisdictions around joint enforcement

Strategies to Drive HERD Demand

Driving the market toward energy efficiency empowers home buyers and sellers to value energy efficiency. Home energy labelling provides communities with a straightforward way to value residential energy efficiency.

Significant market penetration of HERD gives communities access to energy labels of comparable homes in the neighbourhood (e.g., similar year of construction, size, area, etc.).

Jurisdictions can adopt the following strategies to drive labelling demand:

- Offer rebates, incentives, or subsidies to undertake labelling and upgrades
- Integrate HERD into building code requirements and other efficiency programs
- Explore home financing options (PACE, private lending, etc.)
- Conduct ongoing targeted marketing and outreach campaigns
- Train real estate professionals to communicate the value of HERD to their clients
- Provide renovators and home assessors with tools to market energy efficiency

Marketing Strategies

Several marketing strategies can be geared toward the target audience of the HERD program. Multiple platforms can be used to share marketing materials, such as:

- Paid media: social media promoted advertisements, targeted online advertisements, advertisements in newspapers, etc.,
- Government-owned media: Websites, newsletters, blogs, utility bill inserts, social media posts
- Earned media: Articles about the launch, success stories, etc.

Collaborating with non-profits and local champions for community-based marketing can also help in conducting outreach by organizing community events. Marketing strategies should be tailored for specific audiences as detailed below.

Homeowners

Outreach to homeowners interested in learning more about their homes' performance can often be coordinated with energy labelling program messaging and marketing channels, including utility newsletters, neighbourhood, and municipality-wide online groups, and targeted social media posts. Homeowners can also be reached through community events and local groups. CAP's 2022 Canadian national survey results indicate that most homeowners want more information about their utility bills and their potential to save on energy costs. Marketing efforts can be geared toward an energy labelling program as a solution to find energy 'leaks' in a home and address potential utility bill savings.

Home Sellers

Strategic marketing to home sellers supports market transformation toward valuing energy-efficient homes. Marketing for HERD programs that tie energy labelling to time of sale requirements should focus on encouraging home sellers to obtain labels documenting their home's energy performance. In addition, advertisements on MLS listing websites and the distribution of informative flyers at real estate agencies can help reach out to potential home sellers.

Home Buyers

HERD programs can reach home buyers through targeted ads on social media and MLS listing websites commonly used by home buyers. Home energy assessors, home inspectors, and contractors are key channels to promote labels to home buyers. Marketing and communication products must be developed to support assessors, inspectors, and contractors in providing energy efficiency information to prospective customers.

Real Estate Professionals

Real estate professionals can also be great allies for marketing the program. Educational webinars, events and sessions geared toward training real estate professionals on green homes and HERD equips them to communicate the value of energy efficiency to potential clients.

Testing & Refining Marketing Strategies

Monitoring the impact of marketing tactics and tracking conversion rates is crucial to successful HERD program uptake. Through web tracking tools, the performance of campaigns on all different platforms must be evaluated periodically to determine the platforms that attract the most clients. Communications products must be refreshed and updated periodically to include local success stories, key statistics about program uptake and energy dollars saved. Client feedback surveys also provide critical information about marketing and publicity tactics.

Section 5

Milestone Framework for HERD Implementation



The Milestone Framework proposed in this section is not prescriptive. Rather, it provides detail of general key steps that can be followed in the creation of a HERD program. We employ a four-milestone system using the following milestones:

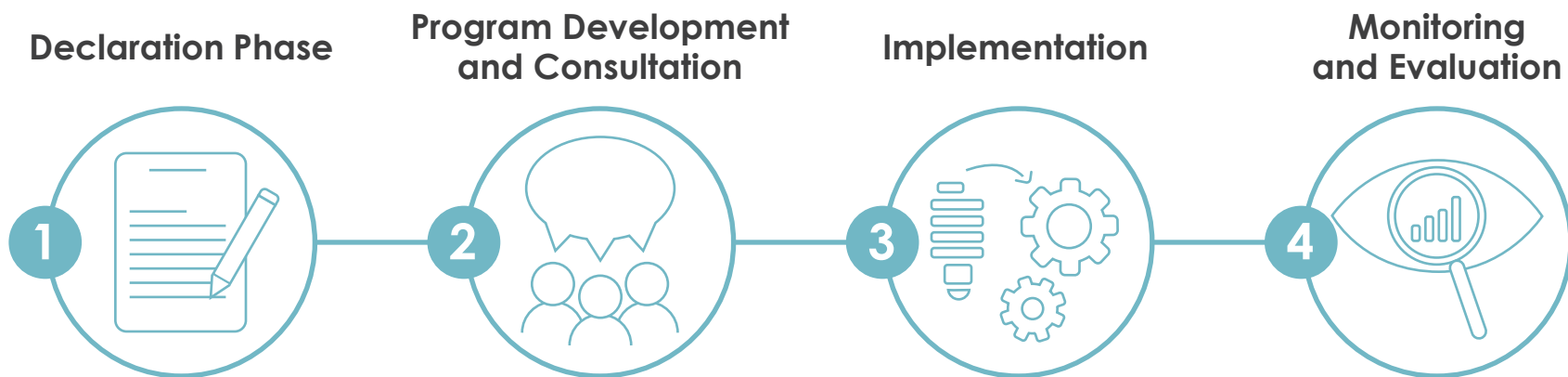


Figure 30 - HERD milestone framework implementation process flowchart

— Milestone 1: —

Declaration Phase

At the end of Milestone 1, you will have identified:

- A clear business and environmental case to advance HERD program
- A program team
- Alignment with other jurisdictional plans and policies
- Key principles for a successful HERD program

This will be achieved through the following key steps:

1. Develop a business case and establish a project team
2. Identify alignment with current policies
3. Identify key program principles

— Step 1: — Develop a Business Case and Establish a project Team

First, develop a business case for advancing HERD and identify the environmental, economic, and social benefits for your community. Create a strong value proposition, aligned with other economic and environmental plans and policies, and communicate your proposal to key decision makers and council to receive direction to explore options and pursue recommendations.

Establish an interdepartmental working team, potentially including housing, environment & energy, finance, buildings, public health and other relevant departments. Broad staff participation will help identify key considerations and challenges to help refine program development and implementation. Involving external experts from the development community, utilities, real estate boards and other agencies can also support well-rounded program development.

- Involve a diverse array of staff early in the process
- Clearly articulate internal and external roles
- Establish Program Framework, create Terms of Reference and a Workplan
- Create a vision, goals, and guiding principles
- Delineate roles for all parties: Council, program staff, third party program delivery agents (if applicable), utilities (if applicable), and external stakeholders (if applicable)
- Map out the relevant stakeholders and create an engagement plan with timelines

— Step 2: — Identify Alignment with Current Policies

Identify where existing associated emissions reduction policies are embedded in municipal plans and requirements. The visions and goals in these documents can be complemented through a comprehensive HERD program. The following plans may provide alignment opportunities for HERD programs:

- Community Energy Plans
- Greenhouse Gas Reduction Plans
- Land Use Plans
- Climate Action Plan
- Community and Sustainability Master Plans
- Economic Development Plans

— Step 3: — Identify Key Program Principles

HERD programs should provide clear, reliable, standardized information to residents about their home's energy efficiency and promote the transparency of energy information in the real estate market. The following principles can guide the development of a well-designed and successful HERD program:

- Consider beginning with a voluntary program to “seed” the market so consumers, real estate professionals, lenders, and utilities can assess the effects
- Do not reinvent the wheel – there are many successful voluntary and mandatory HERD programs in in Canada, the United States, the EU and Australia
- Seek opportunities for cost efficiencies — collaborate with other municipalities to research, consult and develop programs. Partnerships between municipalities can also be used to apply for external program funding
- Level the playing field – apply an equity lens and explore opportunities to provide funding supports to marginalized and underserved groups

— Milestone 2: —

Program Development and Consultation

At the end of Milestone 2, your jurisdiction will have:

- Up-to-date research on existing HERD programs and policies
- A program framework identifying key program goals and objectives
- A program design including details such as type of program, target audience, administration, incentives, funding etc.
- Resources and tools to support program stakeholders

This will be achieved through the following steps

1. Conduct landscape analysis
2. Develop program framework
3. Develop program design
4. Develop tools and resources for homeowners

— Step 1: — Conduct Landscape Analysis

Conduct a background analysis and jurisdictional scan of national and sub-national HERD programs to identify best practices for developing a HERD program.

— Step 2: — Develop Program Framework

Once a thorough jurisdictional scan has been conducted and the program design has been determined, the next step is to create a HERD program framework. Determine key objectives to advance a HERD program that best fit the energy efficiency and climate goals of your jurisdiction. The policy objectives can include any combination of the following:

- Increase the relative value of energy efficiency in real estate transactions
- Motivate homeowners to undertake home energy upgrades
- Raise energy performance of new and existing homes

- Increase the installation of renewable energy systems
- Drive the market transformation toward net-zero homes
- Decrease utility bills for consumers to address energy poverty
- Reduce GHG emissions from the residential sector
- Create green jobs and provide local workforces with new opportunities

Once key objectives are determined, conduct a thorough assessment of current policies and market conditions, including relevant energy efficiency or rating programs in the area. This can help you gather important information before you start designing your program. Consider the following points:

- What building codes are currently mandated?
- Are there plans to implement Green Building/Development Standards?
- Can current real estate practices be leveraged to support HERD?

- Are other entities (e.g., lenders, banks, provincial/local funds, utilities, or non-profits) currently offering financing mechanisms (e.g., loans, rebates, incentives, grants, etc.) to encourage the construction of energy-efficient homes or retrofits of existing homes?
- What relevant data is available (e.g., estimates of home energy usage, cost, number of EnerGuide-assessed homes)?
- What data can energy utilities share?

— Step 3: — Develop Program Design

Once you have your program objectives and relevant supporting programs and policies identified, the next step is to develop your program design. Determine the scope, roles/responsibilities, timing, and other logistical elements. Determine which housing archetypes are to be included, if the program will be voluntary or mandatory, and the key triggers for inclusion (e.g., sale of a home, renovations above \$30,000 etc.). There are several approaches to creating a HERD program. The following program characteristics must be determined:

- Will the program be voluntary or mandatory?
- What will trigger the home energy labelling requirement?
- Will you use the EnerGuide system or an alternate?
- Will audits be conducted in-person or remotely?
- Will you collaborate with other jurisdictions to develop the program?
- Will there be incentives to support HERD?
- Will the program be administered internally or by a 3rd party?
- How will the program be funded?
- Will the program cover single-family homes only or include MURBs?
- Will the scores be uploaded to a publicly available database?

— Step 4: — Develop Tools and Resources for Homeowners

Program tools and resources must be created for applicants and staff to navigate the HERD program. Various tools such as cost estimators (e.g., for renovation costs), savings estimators (e.g., energy savings post renovation), and resources such as program guides, webinar and videos on home labelling and retrofits, a list of Frequently Asked Questions, etc. must be developed. A program website displaying overall information and important details about the program must be created. The website should include:

- Trigger points for when a home needs an evaluation
- How an energy label is obtained
- How to interpret the home energy report
- Tailored tools for homeowners, real estate professionals, energy assessors etc.
- Broader program goals (e.g., climate action)
- Related resources, such as a municipal climate action plan
- Energy assessor database
- Information on available grants, loans, and incentives
- A virtual guidebook that can walk homeowners through the HERD process
- Webforms for applicants
- Information detailing the public nature of HERD

— Milestone 3: —

Implementation

At the end of Milestone 3, you will have:

- Clear, public outreach materials, internal and external communication material for stakeholders
- Training and outreach materials and a communications schedule
- A list of ongoing program implementation activities

This will be achieved through the following steps:

1. Communicate the program to stakeholders
2. Train staff and conduct outreach
3. Continue ongoing implementation activities

— Step 1: — Communicate the Program to Stakeholders

Developing communications products before the program launch will help communicate the overall vision and key details to internal and external stakeholders.

Public-facing general communications

Public facing communications use simple language to convey why the jurisdiction is implementing a HERD program and how it aligns with other municipal policies. Appropriate channels include municipal webpages, flyers, council newsletters, targeted social media campaigns, and introductory webinars for homeowners and real estate agents.

Internal communications

Internal communications on the progress of the program should be disseminated to staff involved in the development and review of the program. This can be channelled through an internal online project website (if applicable) where the project's final deliverables will be posted, as well as e-mail bulletins to staff.

External communications

External communications should keep applicants informed of project updates, timelines, stakeholder engagement sessions, resources, and feature examples of success stories. These can be delivered through e-mail, e-bulletins and newsletters, and social media. External communications directed towards homeowners (existing and potential program applicants), real estate professionals, contractors, and developers, and can include the following information:

- Applicant Resources: Eligibility guidelines, the application process, and the economic and environmental benefits of energy efficiency
- Newsletters showcasing success stories: Once several homeowners have undertaken home energy labelling and subsequent retrofits to improve energy efficiency of their homes, feature their experience and success stories.
- Resources for real estate professionals: Brochures and online information sessions for real estate professionals to highlight the benefits and value of energy efficiency in real estate.

— Step 2: — Train Staff and Conduct Outreach

- Train internal project staff on the updated process for implementing the program
- Initially conduct internal staff training and then set up regularly reoccurring training. Ensure project staff are familiar with the rationale, purpose, and value of the HERD process and are well-positioned to communicate the benefits of the new requirements to the homeowners.
- Conduct Periodical Outreach: Create manuals and user guides to assist program applicants, energy assessors, real estate professionals and developers.
- Provide online and offline support for various types of applicants. Offer repeated external training and workshops for existing and potential applicants, energy assessors, real estate professionals and developers.

— Step 3: — Continue Ongoing Implementation Activities

Ongoing HERD project implementation activities include:

- Partner and stakeholder coordination and new partnership development for program expansion
- Software maintenance and updates
- Hosting and updating energy scores and associated data on maps and MLS websites
- Providing training and assistance to energy assessors
- Ongoing training for stakeholders, outreach, and marketing
- Registering program feedback from stakeholders and compiling it for program review
- Progress reporting and evaluation
- Exploring additional funding potential to expand the program scope, reach, incentives, and uptake

— Milestone 4: —

Monitoring and Evaluation

Milestone 4 covers the ongoing monitoring and evaluation process after a HERD program has been implemented.

Milestone 4 is achieved through the following steps:

1. Develop key metrics
2. Create a monitoring and evaluation framework
3. Adjust the program as necessary

— Step 1: — Develop Key Metrics

Develop metrics to measure the program's effectiveness. Create structured internal processes for periodic review of these metrics to evaluate program effectiveness and opportunities for efficiencies and improvements.

Metrics are the outcome(s) that will be reported to define program uptake, and they can be both qualitative, and quantitative. Potential metrics can include:

- Number of program applications received
- Number/ percentage of energy assessments undertaken
- Number of energy labels delivered
- Value of incentives distributed
- Number of homes undergoing renovation post-assessment
- Number of homes undergoing reassessment post retrofits

- Average home rating (pre/post)
- Carbon Reduction (TCO₂)
- Number of energy assessors engaged

— Step 2: — Create a Monitoring and Evaluation Framework

This M&E Framework will help in the identification and circumvention of key HERD program barriers, including but not limited to:

- low program uptake (for voluntary programs)
- performance risk
- financial risk
- program cost overruns
- participant dissatisfaction
- contractor availability

Monitoring and evaluation types

Monitoring focuses on the systematic collection of program indicators and is used at set intervals throughout program delivery. Evaluation is a more complete interim or final analysis of a program's impacts, identifying outcomes, successes and lessons learned. To ensure objectivity, evaluations are typically performed by 3rd parties. HERD programs should plan and budget for monitoring and evaluations from the outset. A recommended evaluation budget for HERD programs is 5-10% of total administration fees. Three types of studies and reports are commonly used for monitoring and evaluation: monitoring reports, process studies, and impact studies.

Monitoring reports

Monitoring reports track performance indicators, often taken from the program database. They should be easy to compile, simple in their presentation, and released regularly. These reports allow program administrators to address problems and barriers to success in a timely manner.

Some performance indicators that could be used are presented here:

- Participation rates
- Number and dollar value of subsequent projects underway or completed

- Administration, outreach, and marketing costs
- Energy scores correlated with property information, including building characteristics and energy performance

Process study

Process studies assess program efficiency and effectiveness. They are used at the end of a pilot program, or at specific intervals through a pilot. They evaluate how well the processes involved in the program worked to achieve the program goals. Processes commonly evaluated are marketing and outreach, market evaluations, application process including reasons for participant dropout, and internal management plus application processing.

These evaluations typically use carefully constructed surveys or interviews with homeowners in all stages of the process as well as administrators, contractors, energy auditors, etc. These results are analyzed in the context of the program design, marketing strategy, and economic conditions to identify process adjustments that can be used to improve program efficiency and effectiveness.

Impact study

Impact studies are conducted at the end of a program. If a program runs for many years, an interim impact study may be used. The goal of the impact study is to quantify the multidimensional impacts of the program. These results are used to communicate results to stakeholders and funding partners and may be used to build a business case for program expansion, or to recommend design improvements. Some of the impacts that could be included are total participation rates, total cost, estimates of energy savings, estimates of GHGs reductions, effects on the local economy including job creation, and the total effect on the local building stock. These results will help to communicate the cost-effectiveness of the program.

— Step 3: — Adjust the Program as Necessary

Tracking and monitoring the program uptake can help identify gaps in the existing program framework. Program evaluators can also examine uptake in specific market segments. Based on this, program criteria and parameters can be adjusted to encourage uptake or reflect new municipal priorities. This adjustment can be done by:

- Increasing compliance thresholds to require more homes to participate
- Adjusting rating scales to raise levels of energy efficiency, the relative difficulty of implementing the improvement, and any updated processes and requirements
- Amending voluntary labelling requirements to make it mandatory

Program operators should also monitor feedback on tools, process, forms, and supporting resources to ensure continuous improvement. Feedback should be solicited not only on the program itself but also on the communications products. Feedback and data can be used to measure program success in policy planning and to update policies as necessary.

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Appendix B

CAP Homeowner Survey



Methodology:

1,000 Canadian adults (homeowners or seeking to purchase a home in the next 12 months)

Demographics:

- Age (18 – 30, 31 – 40, 41 – 50, 51 – 60, 61+)
- Gender (Male, Female, Other)
- Region (BC, Alberta, Sask/Man, Ontario, Quebec, Atlantic Canada)
- Annual Household Income (<\$50k, \$50-\$100k, \$100k+)
- Education – (High School or Less, College or Technical School, University)
- Homeowner / Renter
- Seeking to Purchase in next 12 months / Considering renovations

Intro

Residential buildings account for a large proportion of the greenhouse gas emissions that cause climate change. Home energy labels give homeowners an understanding of their energy consumption and emissions.

A home energy assessment can help you understand the whole picture of your home's energy use, comfort, and safety. Energy assessments also involve analysis of home energy usage, occupancy profile and utility bills.

In-home energy assessments are conducted by certified energy auditors by reviewing ventilation, doors, windows, and insulation.

Virtual energy assessments are conducted remotely by scanning your home with a drone or through video chats with homeowners to virtually assess the condition of the home.

Results of an energy assessment can be converted into a rating, and the rating can be converted to a label. The label can be disclosed to the home buyers or the public to let them know how a home performs and potential upgrades to improve performance.

Below is a series of questions about home energy ratings and we would like to know your opinions on them.

Q1. How important is it to know if a home is energy efficient and the approximate operating costs of a home?

Choose one.

- ☐ Very important
- ☐ Moderately important
- ☐ Not too important
- ☐ Not important at all

Q2. What do you think of when you hear the term energy efficient home?

- ☐ Select all that apply
- ☐ Lower utility bills
- ☐ Reduce emissions that cause climate change
- ☐ Better heating and air conditioning equipment
- ☐ Lower energy consumption
- ☐ LED lighting
- ☐ Better insulation
- ☐ Energy efficient windows and doors
- ☐ Other [WRITE-IN]

Q3. Do you think that a home's price would be affected by requiring its sellers to disclose their home's energy rating?

Choose one.

- ☐ Definitely
- ☐ Probably
- ☐ Probably not
- ☐ Definitely not
- ☐ Not sure

Q4. Would you be willing to get an energy assessment completed to determine your home's energy efficiency?

Choose one.

- ☐ Definitely
- ☐ Probably
- ☐ Probably not
- ☐ Definitely not
- ☐ Not sure

Q5. How much would you be willing to pay to have your home energy rated?

Choose one.

- ☐ Nothing
- ☐ Less than \$250
- ☐ From \$251 to \$500
- ☐ More than \$500

Q6. What is your preference for conducting home energy evaluations?

Choose one.

- ☐ On-site evaluation by a certified energy advisor
- ☐ Virtual evaluation
- ☐ Online self-assessment by inputting utility bill and home information
- ☐ Not sure
- ☐ I do not want an energy rating

Q7. What are the reasons for which you would like to get your home's energy efficiency evaluated?

Choose all that apply.

- ☐ I want to know where I could save money on my utility bills
- ☐ I want to increase the value of my home
- ☐ I want to protect the environment
- ☐ I need to replace my heating or air conditioning equipment
- ☐ I need advice on upgrades to my home's windows, doors, or insulation
- ☐ It is required to access a government or utility incentive program
- ☐ Other [WRITE-IN]
- ☐ None of these [EXCLUSIVE]

Q8. What type of information would you like to obtain from your home energy assessment?

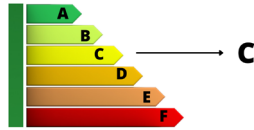
Choose all that apply.

- ☐ Annual energy consumption
- ☐ Annual emissions that cause climate change
- ☐ How energy is consumed in my home (i.e., heating and air conditioning systems)
- ☐ How energy is being lost in my home (i.e., doors, windows, insulation, attic, etc.)
- ☐ Recommendations for energy savings
- ☐ Cost analysis of completing retrofits
- ☐ List of incentive programs for completing retrofits
- ☐ Other [WRITE-IN]
- ☐ None of these [EXCLUSIVE]

Q9. How easy is it to determine if a home is energy efficient with each of the following home energy labels?

Choose one for each row.

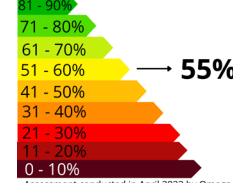
a. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 190
MBTU/year



Assessment conducted in April 2022 by Omega services ltd. Regd #1258G46 all rights reserved. For a detailed home assessment report, click here. Find out what your rating means and how you can improve your energy efficiency score.

- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

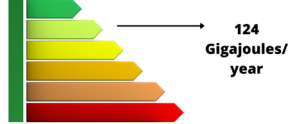
b. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 190 MBTU/year



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- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

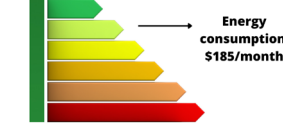
c. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 190 MBTU/year



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- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

d. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 130 MBTU/year



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- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

e. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 170 MBTU/year



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- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

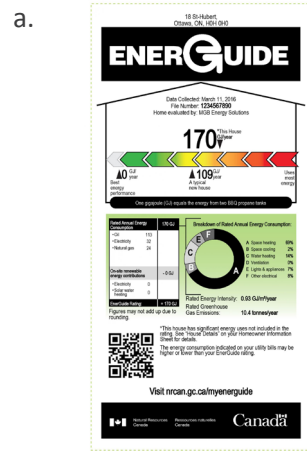
f. 190 Deerpark lane,
Middleworth, ON Home Size: 1500 sqft
Energy consumption: 120 MBTU/year



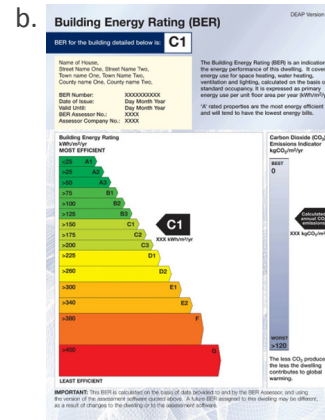
Assessment conducted in April 2022 by Omega services ltd. Regd #1258G46 all rights reserved. For a detailed home assessment report, click here. Find out what your rating means and how you can improve your energy efficiency score.

- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

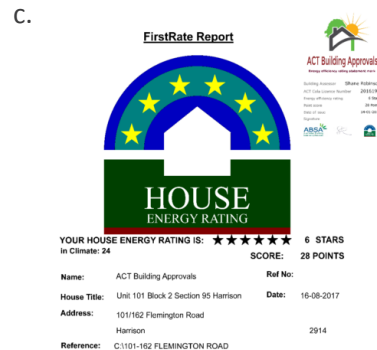
Q10. How easy is it to determine if a home is energy efficient with each of the following home energy labels?
Choose one for each row.



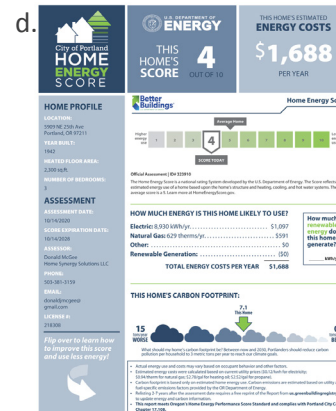
- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure



- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

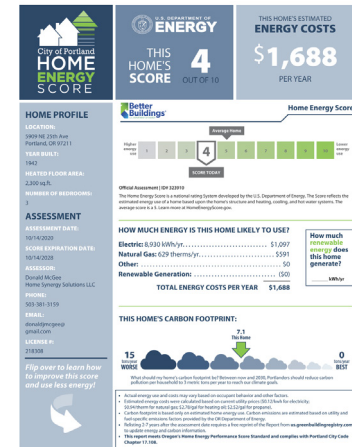
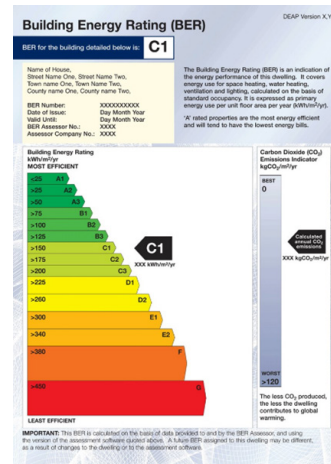
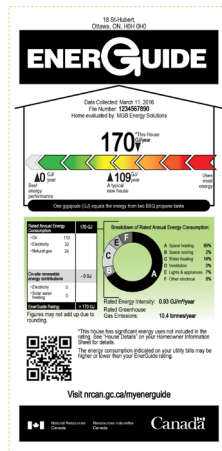


- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure



- ☐ Very easy
- ☐ Moderately easy
- ☐ Moderately difficult
- ☐ Very difficult
- ☐ Not sure

Q11. What information is useful from these energy label examples?
Choose all that apply.



- ☐ Energy consumption per year
- ☐ Letter grade
- ☐ Number scale
- ☐ Comparison to a typical new home
- ☐ Green to red colour scale
- ☐ Breakdown of energy consumption
- ☐ Environmental impact
- ☐ Access to more information

Q12. Which units are easier to interpret energy consumption on a home energy label?

- ☐ kwh/month
- ☐ kwh/year
- ☐ Letter grade A to F
- ☐ GJ/year
- ☐ A 10-point rating scale
- ☐ Monthly utility bill estimates in dollars

Q13. Should the home energy efficiency evaluation and labelling process be tied to the time of sale/lease of a house?

Choose one.

- ☐ Definitely
- ☐ Probably
- ☐ Probably not
- ☐ Definitely not
- ☐ Not sure

IF “Definitely” OR “Probably” on Q13, ask Q14.

Q14. When would you prefer to get energy efficiency information during the real estate transaction?

- ☐ Choose one.
- ☐ Upfront on the listing websites
- ☐ During the home visit
- ☐ At the time of the conditional offer

Q15. Would you pay a premium for efficient homes?

Choose one.

- ☐ Yes, I would pay 0 - 2% premium
- ☐ Yes, I would pay 2 - 5% premium
- ☐ Yes, I would pay 5 - 10% premium
- ☐ No, I would not pay a premium for an energy efficient home

FINAL. Thank you for filling out the survey!

We appreciate your time and effort in providing us with your input. ==30==

The background of the slide is a grayscale aerial photograph of a suburban neighborhood, showing numerous houses with varying rooflines and some palm trees. In the bottom right corner, there is a large, semi-transparent, stylized swirl graphic that resembles a flame or a stylized letter 'S'.

Appendix C

Briefing Note: Home Energy Rating and Disclosure

Introduction

The low-rise residential building sector, which includes single-detached and single-attached houses, accounts for 83% of total Canadian residential energy usage.

Residential buildings emit greenhouse gases (GHGs) such as methane and carbon dioxide from fuels used to heat the air and water in a home and from GHGs embedded in electricity. These fuels produce GHGs directly when combusted to generate heat.

Home Energy Rating and Disclosure (HERD) provides visibility to home energy performance and can accelerate the market transformation toward lower home emissions. A home energy rating, obtained through an energy assessment, is an official record of a home's energy performance.

A home energy assessment report generally includes:

- a standardized rating, allowing homeowners to quickly gauge overall efficiency
- a detailed evaluation of energy systems
- custom energy upgrade suggestions, estimating potential energy savings and rating improvement.

HERD Programs Currently in Place

- **European Union (EU)** - All 27 EU member states (plus the United Kingdom) require energy performance labels for all buildings. Labels must be presented to prospective buyers/tenants at the time of sale, rental, or construction.
- **United States (US)** - Some cities in the US such as Austin TX, Berkley CA, Chicago IL, Minneapolis MN, Montgomery Country MD, and Portland OR require home energy disclosure.
- **Australian Capital Territory (ACT)** - Home sellers in the ACT must disclose Energy Efficiency Ratings (EER) to potential buyers in all advertising material and at the time of sale.
- Depending on jurisdictional requirements, assessments for home energy labels can vary in how detailed they are and how, where, and to whom they are reported.

Home Energy Labelling Benefits

Advancing HERD programs can bring some notable benefits to the community. HERD programs: -

- Increase the visibility of energy efficiency in the housing market and reward efficient homes
- Lower energy consumption and emissions in the housing sector
- Improve building comfort and occupant health
- Enhance economic development by driving demand for energy audits and home energy upgrades
- Inform and support the development of other energy efficiency programs & policies
- Build community energy literacy and awareness

HERD Barriers

Key barriers to advancing HERD programs include:

- Low homeowner motivation to undertake audits and retrofits
- Pushback from key market actors such as realtors, home builders, renovators, architects, and trades
- Lack of incentives and funding avenues to support energy assessments and upgrade costs
- Low energy costs which discourage homeowners to act on energy efficiency
- Inadequate capacity to deliver programs due to lack of energy auditors, qualified renovators, and tradespeople

Consumer Preference Survey

In 2022 Clean Air Partnership surveyed 1,005 Canadian homeowners, renters, and potential homebuyers regarding their opinions on energy efficiency and HERD. Key findings of the survey include:

- 96% consider it important to know if a home is energy efficient and the approximate operating costs of a home
- 84% believe mandatory disclosure of a home's energy rating will influence its price
- Over 75% are willing to pay a premium to purchase an energy-efficient home
- More than 80% are willing to get an energy audit for their homes
- 70% are willing to pay between up to \$500 for an energy audit
- Over 57% would prefer an on-site evaluation by a certified energy advisor
- 66% would complete an energy audit to reduce their energy bills
- Over 60% wanted information on energy loss in their home and recommendations for energy savings through an assessment
- Over 70% agreed that home energy-efficiency audits and labelling should be tied to the time of sale or lease of the house
- 94% prefer energy performance information upfront on the listing or during their initial home visit
- Most respondents strongly preferred energy labels with a straightforward energy rating scale (A to F, five-star rating, etc.) and annual energy consumption information

HERD Program Considerations

A variety of program design elements must be considered by a jurisdiction when designing a HERD program. Key elements include:

- Residential housing archetypes – Determining which housing types will be targeted to advance home energy labelling programs
- Time of sale labelling requirement – Tying home energy labelling to the time of sale enhances energy transparency and helps homebuyers understand the operational costs of the property and identify potential energy efficiency improvements
- Types of energy assessments – Determining if the labelling program should consider site vs. source assessments, asset-based vs. operational assessments and the methods to conduct an audit (in-person vs. virtual)
- Program financing – Consideration of initial setup and recurring program costs such as staffing, marketing, etc., assessment incentives and/or renovation financing
- Energy assessor database – Creation of a database to search for assessors geographically or by assessment type
- Program model – Program models can include - advancing the federal EnerGuide system, developing a new labelling program or using a pre-existing 3rd party labelling program

Municipal Implications of HERD programs

The residential building sector contributes to 18 percent of Canada's carbon emissions. Municipalities need to address emissions from homes to meet their local climate goals. Home energy assessment tools such as HERD creates a performance rating for operating homes and makes residential building energy use and emissions visible in the community.

Advancing HERD programs can unlock market activity to support municipal energy, environmental, economic and equity goals by expanding the local contractor base and reducing energy burdens on communities while lowering GHGs.

Well insulated buildings with efficient HVAC systems increase the comfort levels of a home, improve the health of residents, and contribute to building community resiliency against extreme events.

Related Webinars and Further Reading

1. ["Home Energy Labeling – a Natural and Necessary Complement to Energy Efficiency Programming" \("Home Energy Labeling – a Natural and Necessary Complement to Energy ..."\)](#)
2. ["Mandatory Home Energy Rating and Disclosure for Existing Houses: Opportunities and Risks for Consumers" \("Mandatory Home Energy Rating and Disclosure for Existing Houses ..."\)](#)
3. [EnerGuide Labeling of Homes at the Time of Sale – Design Recommendations and Alternatives \("ENERGUIDE LABELING OF HOMES AT THE TIME OF SALE"\)](#)

