

Report to Council



Date: December 2, 2019
To: Council
From: City Manager
Subject: Community Energy Retrofit Strategy – Options Analysis
Department: Policy & Planning Department

Recommendation:

THAT Council receives, for information, the Report from the Community Energy Specialist dated November 15, 2019 with respect to options for a Community Energy Retrofit Strategy;

AND THAT Council directs staff to pursue the recommended approach(es) for the Community Energy Retrofit Strategy outlined in the report.

Purpose:

To inform Council on options for a Community Energy Retrofit Strategy and for Council to direct staff to move forward with or focus on several of the proposed options.

Background:

According to the latest Community Energy and Emissions Inventory (CEEI) data from 2017, buildings account for 40 per cent of Kelowna's community greenhouse gas (GHG) emissions and will be a key part of meeting the City's GHG emissions reduction targets. Council's endorsement of Kelowna's Energy Step Code Implementation Strategy for Part 9 residential buildings has set the course for improving energy efficiency in new residential construction and will help achieve energy and GHG emissions reductions from the building sector. However, it is estimated that by 2040, 70 per cent of residential units will have been built before 2018 (Figure 1; details in Attachment A: Kelowna's Existing Building Stock), suggesting that most of the energy and GHG emissions reductions from the building sector over the next several decades will be generated from retrofits to existing buildings. Additionally, the value of energy retrofits extends beyond GHG emissions reduction. As outlined in Kelowna's *Healthy Housing Strategy*, making homes more energy efficient can reduce household carrying costs through a reduction in average utility bills.¹ Additional benefits are discussed on page 3 of this report.

¹ City of Kelowna. 2018. Healthy Housing Strategy. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/logos/healthy_housing_strategy_final_reduced_size.pdf.



Figure 1: Number of residential units in 2040 expected to have been built prior to 2018

To meet the 2023 GHG emissions reduction target, outlined in the *Community Climate Action Plan* (CCAP), one per cent of the existing residential building stock (approximately 539 units) will need be retrofitted annually, achieving a 30 per cent improvement in energy efficiency in each of these units.² To meet more ambitious Provincial GHG emissions reduction targets, a recent study by the Pembina Institute suggests three per cent of the existing building stock throughout the province (approximately 47,000 residential units in BC; 1,617 units in Kelowna) will need to be retrofitted annually.³ From 2014 to 2018, an average of 669 residential renovation permits were issued on an annual basis, representing 1.2 per cent of the existing residential building stock (see Attachment A). Thus, while the CCAP retrofit target may appear to be an easy feat, it would mean that over 80 per cent of permitted residential renovations in Kelowna would need to be targeted toward energy efficiency - a motivation that often ranks near the bottom of motivations for renovating.⁴

From a policy perspective, the challenge for local governments becomes even greater because there is currently no regulatory jurisdiction to mandate or require energy retrofits. While the Province has indicated “new standards for building upgrades will be developed by 2024, guided by the model National Energy Code,”⁵ at this point, it is unclear what the provincial policy will look like, and what authority local governments will have. Therefore, in the absence of a clear policy framework in the short-term, there is a need for a concerted campaign and strategy if the City, along with other levels of government and utilities, are to effectively reduce energy and GHG emissions from Kelowna’s existing building stock.

This report defines the concept of an energy retrofit, discusses some of the main barriers and challenges to adopting energy retrofits, and outlines options or approaches the City can pursue that would form part of the Community Energy Retrofit Strategy.

What is a Retrofit?

A building energy retrofit is an improvement to an existing building’s energy system with the objective of reducing energy usage (e.g., electricity and/or natural gas usage) and/or GHG emissions. They can range from quick modifications like sealing windows to complete replacements of the major systems that heat and cool a building.

When considering retrofits, there are a hierarchy of actions that range in cost, expected impact, disruption to building occupants, and complexity, as illustrated in Figure 2.

² Assumes 2 per cent of residences hear about it per year, 10 per cent of those do something (i.e., 0.2 per cent of residences a year), leads to typical energy reductions of 30 per cent.

³ Frappe-Seneclauze, T.P., Heerema, D., Wu, K.T. 2017. *Deep Emissions Reduction in the Existing Building Stock: key elements of a retrofit strategy for B.C.* Pembina Institute.

⁴ CIBC. 2016. CIBC Home Renovation Poll.

⁵ BC Government. 2018. cleanBC – our nature. our power. our future. Retrieved from: https://blog.gov.bc.ca/app/uploads/sites/436/2019/02/CleanBC_Full_Report_Updated_Mar2019.pdf.

EXAMPLE RETROFIT TYPES⁶

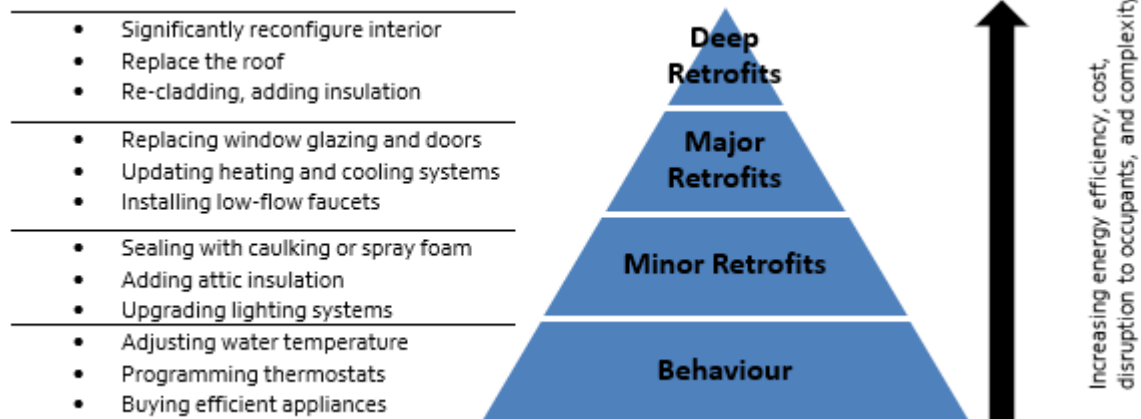


Figure 2: Retrofits types and categories

Benefits

There are many potential benefits to retrofitting a building. Some of the main benefits include:

- reduce a building's energy costs by up to 60 per cent resulting in lower utility bills
- reduce repairs to building components and therefore lower maintenance costs
- reduce GHG emissions
- improve home comfort (e.g., temperature control system)
- improve occupant health (e.g., less mould with improved vapour barrier).⁷

Barriers and Challenges

Despite the multitude of benefits for implementing energy retrofits in a building, uptake is low due to a variety of barriers and challenges. Some of the most common barriers include:

- high capital cost of energy-efficient upgrades
- low cost of energy in Kelowna (i.e., with some of the lowest energy costs in Canada and North America,⁸ the financial payback of energy retrofits can be long in BC compared to other areas and reduce the incentive to conserve energy.)
- lack of consumer knowledge about the benefits and opportunities
- lack of skilled and knowledgeable contractors to advocate for and complete energy retrofits
- lack of jurisdictional authority for municipalities to require energy retrofits.

Options:

With significant barriers to large-scale adoption of energy retrofits, evidence to-date suggests the market cannot be solely relied upon to increase energy efficiency in Kelowna's existing building stock. The City, with the help and cooperation of the provincial and federal governments and utility providers

⁶ Natural Resources Canada. 2019. Retrofitting. Retrieved from: <https://www.nrcan.gc.ca/retrofitting/20707>.

⁷ The Atmospheric Fund. 2019. Energy efficiency 101: Why do an energy retrofit? Retrieved from: <https://taf.ca/energy-efficiency-101-energy-retrofit/>.

⁸ Hydro Quebec. 2019. 2019 Comparison of electricity prices in major North American cities. Retrieved from: <http://www.hydroquebec.com/data/documents-donnees/pdf/comparison-electricity-prices.pdf>.

can play a key role. The City needs to recognize its limited authority and determine the degree to which it will contribute resources to promote and/or incentivize energy retrofits while considering the local context. Table 1 summarizes some of the approaches and initiatives that could be considered as part of a Community Energy Retrofit Strategy. More detailed descriptions of the options are provided in Attachment B and Attachment C summarizes some examples of retrofit policies and programs from other communities.

Table 1: Options for Community Energy Retrofit Strategy

Program	Description
Regulation	
Energy Codes	Energy codes are the most prominent method in place to ensure action on GHG emission mitigation in buildings. The development of model codes in Canada, including the National Energy Code for Buildings (NECB), are modified as necessary by provinces to become enforceable building codes ⁹ The Province indicated in the CleanBC Plan that it intends to implement a retrofit code by 2024. In the absence of this code, the City cannot legally create its own code to require energy efficiency levels or upgrades for existing buildings. A legal opinion obtained by the City of Victoria suggests that BC local governments can require an EnerGuide assessment as a condition of receiving a building permit; however, they (apart from the City of Vancouver) cannot require energy efficiency levels or upgrades.
Energy Benchmarking	Energy benchmarking policies require large building owners or managers to measure and disclose their energy use. These disclosure policies make it possible for potential buyers, renters, and tenants to see which buildings are more energy-efficient, as part of their purchase or leasing decisions, and therefore giving owners additional incentives to invest in energy efficiency. ¹⁰ In BC, some local governments have been encouraging the Province to establish building energy benchmarking policy and to clarify the authority for municipalities to develop their own bylaws.
Home Energy Labelling	Several municipalities in the US have adopted policies requiring residential home energy ratings be disclosed at various trigger points (e.g., time of home listing or sale). Home energy ratings are numerical scores based on an assessment of a home's energy efficiency, and let buyers compare the energy efficiency and performance of various homes, much like real-estate walk score ratings. ¹¹ Municipalities cannot require home energy labelling, but provincial governments can and through CleanBC, the Province has indicated its intent to require home energy labelling at the time of sale, although the timelines and program details are unknown at this point.
Incentives	
Rebates	Rebates help overcome the barrier of higher up-front costs of energy-efficient products or services by offering a financial refund to lowers costs. The City can support rebate programs by: (1) leveraging its marketing channels to promote existing rebate programs;

⁹ Heerema, D. 2017. Energy Regulations for existing buildings are changing. Are you ready? *Building*, October-November 2017, 23-25.

¹⁰ Meng, T., Hsu, D., and Han, A. 2017. Estimating energy savings from benchmarking policies in New York City. *Energy*, 133, 415-423.

¹¹ American Council for an Energy-Efficient Economy. 2018. Policy Brief - Home energy efficiency policies: ratings, assessments, labels, and disclosure. Retrieved from: <https://aceee.org/sites/default/files/pdf/topic-home-energy-assessment.pdf>.

Program	Description
	(2) “top-up” existing rebate programs (i.e., add a bonus incentive to an existing rebate); or (3) offer its own unique rebate programs for retrofits not covered by other rebates.
Tax Exemptions	Municipalities can exempt the municipal portion of taxes paid by a property owner (business or residential properties) who meet certain criteria during an investment in the property, ¹² provided the requirements in the <i>Community Charter</i> are met. Tax exemptions have not been widely used to incentivize energy retrofits; however, several municipalities in the US have adopted this initiative as part of their retrofit program portfolio (e.g., New York City).
Financing	
Local Improvement Charge (LIC) / Property Assessed Clean Energy (PACE) Financing	LIC Loans (often referred to as PACE) are a financing tool offered by local governments that allow property owners to borrow money to undertake a broad spectrum of energy retrofits to their buildings. The loan is paid back on the owner’s property tax bill, with the energy bill savings created by the improvements, often resulting in net gains for the property owner. Unfortunately, BC has not developed LIC or PACE enabling legislation, therefore municipalities are currently limited in terms of implementing a local program.
Education / Awareness	
Information Distribution	Information distribution assets are characterized by simple, punchy messaging which culminates in a call to action. These assets are meant to generate increased awareness of energy retrofits, and the possible benefits associated with them. Some examples of information distribution channels are mass marketing campaigns, targeted digital campaigns, live media, and events.
Education Assets	<ul style="list-style-type: none"> • Digital Assets: A digital asset is targeted to owners interested in doing retrofits and can be as simple as providing detailed information on incentives (e.g., www.betterhomesBC.ca) or could be more complex by requiring users to input information to obtain suggestions on how to reduce energy or emissions (e.g., www.gofuelswitch.com). • Physical Assets: Physical assets provide building owners the opportunity to see, touch and use equipment, building materials, and energy saving techniques they might not otherwise be familiar with to increase comfort levels and encourage retrofits (e.g., The Wilden Living Lab is a local example).
Educational Interventions	Educational interventions are focussed on capacity building for building owners and industry professionals and could include lunch and learns, public access lectures, and tours. Education and training need to be enacted to ensure the success of any retrofit effort.
Targeted Marketing	Because education and awareness will play a big role in retrofit uptake, the more intentional and targeted the messaging is, the more effective it will be. Targeted marketing uses data to identify priority areas for energy retrofits (e.g., building age, demographic data). While the City has some understanding of Kelowna’s building stock (attachment A), it has not mapped energy/GHG emissions from buildings at the neighbourhood or parcel level to develop a targeted campaign.

¹² Tax exemptions for businesses are exempted from section 25(1) of the *Community Charter* by section 226 (14) which grants the authority to provide a tax exemption subject to the conditions described in section 226.

Recommended Approach:

It is recommended that a Community Energy Retrofit Strategy incorporate the following initiatives:

- **Expand education / awareness initiatives:** Education and awareness are critical first steps in an energy retrofit program to help create a market shift towards retrofits. Although the City is currently helping to promote existing FortisBC and provincial rebate programs, these efforts will need to be supplemented with additional education and awareness initiatives from all subcategories in order to create a stronger consumer knowledge base around the benefits of energy retrofits of existing buildings. Among other things, initiatives should include promotion of available rebate programs, increased digital assets that are locally specific (e.g., a dedicated web resource for local retrofit programs and incentives), industry training events, and targeted marketing to areas that offer the best opportunities to efficiently reduce GHG emissions.

One example of an awareness initiative is the Thermal Imaging Camera program the City recently received FortisBC funding to implement. Through this program, residents will be able to borrow thermal imaging cameras from City Hall and the Okanagan Regional Library to better visualize heat loss in their homes. The motivation for the program is that if occupants can better visualize and understand energy inefficiencies in their home, they will be more inclined to address the inefficiencies through energy retrofits.

- **Continue the development of a prototype “Canadian Energy End Use Map” in partnership with Natural Resources Canada (NRCan):** The City is currently in the early stages of partnering with CanmetENERGY-Ottawa, a division of NRCan, to develop an online map-based decision tool for building stock energy efficiency. The aim of the project is to make residential energy end-use and efficiency opportunities visible on a map, using available federal, municipal, and open data, and leveraging Kelowna’s existing Model City. Available data can be used to correlate specific household attributes with each other to develop targeted marketing campaigns and identify priority geographic areas for the Community Energy Retrofit Strategy.
- **Expand Kelowna’s rebate top-ups:** The City has currently dedicated up to \$20,000 from Development Services Permit Averaging Reserve Account to participate in a Municipal Top-Up to EnerGuide home evaluations through BetterhomesBC between October 2019 and September 2020. Through this program participants in Kelowna get a \$300 rebate from the Province and a municipal top-up rebate of \$150 (for a total incentive of \$450), covering 50 to 75 per cent of the cost to conduct a pre and post-retrofit energy assessment of their home. The City could expand the funding for BetterhomesBC municipal top-up opportunities to include electric service upgrades and switching from a fossil fuel water and/or space heating system to an electric heat pump water and/or space heating system, effective mechanisms to significantly reduce GHG emissions from existing buildings. One key benefit of this program structure is that the Province handles all administrative components (e.g., distribution of rebates, website) and provides quarterly reports summarizing program participation. Thus, the only requirement for the City is to commit a maximum budget that would be allocated to the top-up.
- **Conduct a legal assessment to determine if the City can require an EnerGuide Assessment at time of renovation permit:** Regulation is more effective than voluntary approaches when it comes to shifting the energy retrofit market. A recent legal opinion by the City of Victoria suggests local governments have the authority to require an EnerGuide assessment as a condition of receiving a building permit. EnerGuide assessments can be valuable educational tools that create awareness of a home’s baseline energy performance and priority areas for

energy efficiency improvements. To confirm that this policy tool is available, the City should obtain a separate legal opinion that is specific to Kelowna's context. If permitted, a policy to require an EnerGuide assessment as a condition of receiving a building permit over a specific cost threshold could be explored.

- **Seek clarity from the Province on the direction regarding local government jurisdiction for benchmarking and home energy labelling:** In the US, home energy labelling and benchmarking requirements have been effective at creating awareness of energy consumption and catalyzing increased energy retrofits. The City could join other BC local governments and the Union of BC Municipalities in encouraging the Provincial government to establish a building energy benchmarking policy and to clarify the authority for municipalities to develop their own bylaws. For home-energy labelling, the Province has indicated (through CleanBC) its intent to explore energy rating requirements for homes and buildings at point of sale or lease. The City will stay connected with the Province on this development and ensure that the rollout of the provincial policy is supported locally.
- **Investigate financing models and other funding sources that would support city-wide deep energy retrofits:** The high upfront cost of energy retrofits is one of the biggest barriers preventing wider retrofit adoption. As such, financial models that can minimize upfront costs (e.g., loans, grants) could help address this barrier and make retrofits more feasible for many building owners. Currently there is no LIC or PACE enabling legislation in BC, so municipalities cannot adopt a program. However, the City will continue to explore grant opportunities for specific programs (e.g., through Federation of Canadian Municipalities) and other financial tools that can support retrofits.
- **Explore options to link energy retrofits with upgrades of buildings on Kelowna's Heritage Register:** Heritage and character homes built before 1940 typically have the greatest potential to improve energy efficiency and reduce GHG emissions. One way to target these buildings is through the City's Heritage Grants Program. The City could increase the budget for the Heritage Grants Program, with the increase being apportioned to incentivizing energy evaluations for heritage buildings and/or upgrades that are proven to reduce energy and GHG emissions. The City should also explore other ways to link energy efficiency to heritage buildings.

Conclusion and Next Steps:

While existing buildings present a greater challenge to incorporate energy efficiency than new construction, they also present a significant opportunity because of higher energy and GHG emissions reduction potential of retrofitting older buildings. Retrofitting buildings to reduce energy and GHG emissions is critical to help Kelowna achieve its GHG emissions reduction targets. To achieve this, deep retrofits of the existing building stock is required, which will require an assortment of actions and policies as well as staff resources. Further, these retrofits will also help reduce household carrying costs through a reduction in average utility bills, a priority area outlined in the Healthy Housing Strategy.

Once priority areas are identified and agreed upon, a Community Energy Retrofit Strategy will be developed which will help catalyze increased energy retrofits in Kelowna and ensure community goals are achieved. The strategy is expected to be completed in 2020.

Internal Circulation:

Development Planning
Development Services
Policy & Planning
Building Services

Existing Policy:

- *OCP 2030*
 - OCP Objective 6.2. - "Improve energy efficiency and reduce community greenhouse gas emissions" (and supporting policies).¹³
- *Our Kelowna as We Take Action: Kelowna's Community Climate Action Plan (2018-2023):*
 - Action #B1 – "Partner with FortisBC on delivery and promotion of conservation and energy management programs, including New Home, Energy Conservation Assistance Program, Rental Apartment Efficiency Program, Commercial Custom Design Program and other residential and commercial rebates and offers."
 - Action # B4 – "Develop a community energy retrofit strategy including regulation and incentives to encourage existing building stock to become more energy efficient."
 - Action # B11 – "Investigate financing models and other funding sources that would support city-wide deep energy retrofits."¹⁴
- *Healthy Housing Strategy*
 - Recommended action: "In partnership with FortisBC, develop a Community Energy Retrofit Strategy to encourage and incentivize existing buildings to become more energy efficient. This will reduce household carrying costs through a reduction in average utility bills."¹⁵
- *Imagine Kelowna*
 - Take action in the face of climate change¹⁶
- *Council priorities*
 - Greenhouse gas emissions are decreasing
 - Resiliency and adaptability to climate change¹⁷

¹³ City of Kelowna. 2011. Kelowna 2030 – Official Community Plan: Chapter 6 – Environment. Retrieved from: <https://apps.kelowna.ca/CityPage/Docs/PDFs/Bylaws/Official%20Community%20Plan%202030%20Bylaw%20No.%2010500/Chapter%2006%20-%20Environment.pdf>.

¹⁴ City of Kelowna. 2018. Our Kelowna as we take action: Kelowna's Community Climate Action Plan. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/community/community_climate_action_plan_june_2018_final.pdf.

¹⁵ City of Kelowna. 2018. Healthy Housing Strategy. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/logos/healthy_housing_strategy_final_reduced_size.pdf.

¹⁶ City of Kelowna. 2018. Imagine Kelowna: the Visions to 2040. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/related/imagine_kelowna_short_report_digital.pdf.

¹⁷ City of Kelowna. 2019. Council Priorities 2019-2022. Retrieved from: https://www.kelowna.ca/sites/files/1/docs/council_priorities_2019-2022_summary.pdf.

Submitted by:

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Approved for inclusion:



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cc:

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Development Planning Department Manager

Development Services Director

Sustainability Coordinators

Energy Program Manager

Attachments:

- Attachment A: Summary of Kelowna's existing building stock
- Attachment B: Options for retrofits
- Attachment C: Examples of retrofit policy from other BC communities