

ENVIRONMENT COMMITTEE

TO: MAYOR AND COUNCILLORS

SUBJECT: ZE BUILDING RETROFIT STRATEGY – PRELIMINARY DRAFT

RECOMMENDATION:

THAT the preliminary draft of the Building Retrofit Strategy, Attachment 2 to the report titled “ZE Building Retrofit Strategy – Preliminary Draft” dated June 15, 2023, be endorsed as the basis for further consultation and development.

REPORT

The Environment Committee, at its meeting held on June 15, 2023, received and adopted the attached report providing a preliminary draft of the Building Retrofit Strategy, and seeking Council endorsement of the document as the basis for further consultation and development.

On behalf of the Environment
Committee,

Councillor J. Keithley
Chair

Councillor M. Santiago
Vice Chair

TO: ENVIRONMENT COMMITTEE (EC)
FROM: GENERAL MANAGER PLANNING AND DEVELOPMENT
SUBJECT: **ZE BUILDING RETROFIT STRATEGY - PRELIMINARY DRAFT**
PURPOSE: To provide a preliminary draft of the Building Retrofit Strategy, and to seek Committee and Council endorsement of the document as the basis for further consultation and development.

RECOMMENDATION

THAT the Environment Committee recommend that Council endorse the preliminary draft of the Building Retrofit Strategy, Attachment 2 to the report titled “ZE Building Retrofit Strategy – Preliminary Draft” dated June 15, 2023, as the basis for further consultation and development.

1.0 POLICY SECTION

On July 6, 2020, Council adopted the Climate Action Framework authorizing staff to develop a citywide Zero-Emissions (ZE) Building Retrofit Strategy. The Strategy will move the City towards the ambitious carbon reduction commitments of the climate emergency declaration and the goal of carbon neutrality by 2050.

The preliminary draft of the City’s ZE Building Retrofit Strategy supports the following City strategic, environmental and climate directions:

- City of Burnaby’s *Environmental Sustainability Strategy* (2016) and the *Community Energy and Emissions Plan* (2016) Green Building and Energy goals.
- Burnaby’s *Climate Action Framework* (2020) Big Move 7: ZE Buildings – Retrofits for Net Zero existing buildings.
- *Corporate Strategic Plan* (2022) goals and sub goals of a *Connected Community*, an *Inclusive Community*, a *Healthy Community* and a *Dynamic Community*.

2.0 BACKGROUND

On September 20, 2021, Council authorized staff to partner with Simon Fraser University (SFU) Morris J. Wosk Centre for Dialogue and Vancity on the Urban Resilient Futures (URF) Initiative, which aims to advance climate action work by connecting local government with community members and residents. A Zero Emission Building Retrofit Taskforce (“Taskforce”) was convened as part of the URF initiative to provide recommendations to City staff on the development of a Zero Emission Building Retrofit Strategy.

On November 21, 2022, Council received the Taskforce's report with 8 high-priority and 12 regular-priority recommendations. Council directed staff to develop a citywide ZE Building Retrofit Strategy with an analysis of the feasibility and applicability of the Taskforce recommendations.

The purpose of this report is to provide an update on the development of the City's ZE Building Retrofit Strategy and request that the Committee recommend Council's endorsement of the draft as the basis for further development.

3.0 GENERAL INFORMATION

Burnaby's Climate Action Framework recognizes the magnitude of the carbon emissions from Burnaby's existing building stock through Big Move 7: Zero Emissions Buildings – Retrofits. Energy use in existing buildings makes up 38% of citywide carbon emissions, which is the largest single source in the community's carbon footprint¹. There are approximately 37,000 buildings in Burnaby. In order to reach our goal of carbon neutrality by the year 2050, we need to support building owners and occupants to retrofit their buildings to use more efficient and less carbon intensive energy sources. (*Attachment 1 – Figure 1*).

This work on retrofits is complemented by the Climate Action Framework Big Move 6 – ZE Building-Net Zero New Buildings. Big Move 6 commits to regulating new buildings in Burnaby so that they are zero emission by or before 2030, thereby reducing the rate of new buildings that will require retrofits in the future. This work is currently underway as described by the recommendations adopted through the report to Council on May 8, 2023 *New Energy Efficiency and Carbon Pollution Standards in the BCBC*.

3.1 Existing Building Emissions

There are two primary sources of emissions in existing buildings: space and water heating. These systems account for 85% of all energy used and 77% of all carbon emissions² from buildings. The magnitude of carbon emissions from buildings is heavily influenced by the following:

- Fuel Source (e.g. electricity or natural gas)
 - Natural gas has a carbon emission factor that is 15 times higher than electricity³.
- Energy Efficiency
 - Buildings with energy inefficient appliances and poor air tightness or thermal insulation consume more energy and produce higher emissions.

Driven by Burnaby's goal to reduce carbon emissions and achieve carbon neutrality citywide by 2050, the Building Retrofit Strategy aims to tackle both improved energy

¹ C2MP, July 2020, City of Burnaby – GHG Emissions Inventory Documentation, internal report

² NRCan, 2017, Energy End Use Data Handbook, available at: <https://natural-resources.canada.ca/energy/offices-labs/canmet/ottawa-research-centre/the-built-environment/ultra-efficient-heating-equipment/23514>

³ Local Government Climate Action Program Emission Factors Catalogue. Retrieved from https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/guidance-documents/emission_factors_catalogue.xlsx

efficiency of buildings, and the adoption of lower-emission fuel sources. A third (34%) of the City's carbon reduction opportunities, as modelled for the development of the City's Climate Action Framework, lie with retrofitting existing buildings (*Attachment 1 – Figure 2*).

3.2 Building Retrofits

The majority of the buildings in Burnaby are between 10 and 70 years old, with many more years of economic value left. Most of these buildings were not originally constructed with energy efficiency or carbon intensity in mind. In addition, the mechanical systems such as hot water tanks and furnances in these buildings have a shorter life span than the buildings themselves. This end-of-life cycle replacement provides a key opportunity for energy efficiency and fuel-switching upgrades.

There are different types of building retrofits related to energy efficiency and emissions: from do-it-yourself air tightness improvements, fuel switching from gas to electric space and water heating systems, and finally to deep carbon retrofit works involving changes to building structures and envelopes. This retrofit work varies in complexity and cost (*Attachment 1 – Figure 4*).

3.3 Barriers to Retrofits

Achieving potential emission reductions from existing building retrofits requires large-scale adoption of retrofit work. City staff reviewed the feasibility of the URF Taskforce recommendations and the retrofit policy landscape. This included the:

- Review of international, national and local retrofit programs and strategies;
- Engagement with subject matter experts;
- Evaluation of Burnaby's existing building stock and emissions sources; and
- Analysis of regulatory tools and limits.

Key findings on retrofit programs and public adoption of retrofits identify the following barriers to retrofits, from ideation to implementation:

- Lack of awareness;
- Energy literacy;
- Up-front cost;
- Lack of qualified professionals and tradespeople to complete retrofits;
- Complexity of the process; and
- Limited municipal government powers.

The preliminary draft of the ZE Building Retrofit Strategy (*Attachment 2*) is built upon these reviews and has oriented actions towards overcoming these barriers.

3.4 Preliminary Draft

The preliminary draft of the ZE Building Retrofit Strategy, specifically the objectives and the targeted actions outlined in *Attachment 2*, sets the direction needed to reduce our community emissions. The preliminary draft strategy focusses on the actions local governments can take. The strategy has four major action areas:

Education and Outreach: Enhance retrofit and energy efficiency literacy which in turn accelerates behavioral changes and encourages public participation on building retrofit related carbon reduction and energy efficiency actions.

Incentives: Provide financial and process support to encourage public adoption of retrofit work.

Policy and Bylaws: Reduce barriers in existing bylaws and policy that hinder retrofit work.

Advocacy: Champion the adoption of regulatory tools and supports for retrofits with other orders of government.

This preliminary draft strategy aims to target different interested parties to accelerate the rate of retrofits in the City. With the complexity of different building types, there is no one-size-fits-all solution. Staff recommends that the Committee forward this report to Council, with a recommendation to endorse the preliminary draft of the ZE Building Retrofit Strategy as the basis of further review and development.

3.5 Next Steps

Upon Council endorsement of the preliminary draft, the ZE Building Retrofit Strategy will be circulated for review. As part of the Urban Resilient Futures Building Retrofit Taskforce terms of reference, staff will reconvene the Taskforce to review the draft retrofit strategy for feedback. The final iteration of the ZE Building Retrofit Strategy will then be brought back to Committee and Council for review and approval in Fall 2023.

4.0 COMMUNICATION AND COMMUNITY ENGAGEMENT

Engagement work on climate change and buildings retrofits has been done through a variety of different avenues including:

- The development of the 2016 ESS Strategy, producing retrofit-related Green Building and Energy goals in the ESS Strategy;
- Two community co-design workshops;
- 21 Subject Matter Expert Interviews by Urban Resilient Futures;
- Seven four-hour sessions with the 16-person Building Retrofit Taskforce. The membership of the Taskforce was comprised of residents, tenants, property owners and property managers; technical experts, construction and

homebuilding industry representatives; groups reflecting the needs of residents living in energy poverty, disabilities, and language barriers.

Upon adoption of the ZE Building Retrofit Strategy preliminary draft, staff will consult with Marketing and Communications to develop a comprehensive communication and engagement plan.

5.0 FINANCIAL CONSIDERATIONS

Work on the ZE Building Retrofit Strategy is being undertaken within existing budgeted resources. Should elements of the strategy include financial implications and require additional budgetary support, staff will approach Council to secure funding to allow for strategy implementation.

Respectfully submitted,
E.W. Kozak, General Manager Planning and Development

ATTACHMENTS

- Attachment 1 – Burnaby’s Current State
- Attachment 2 – ZE Building Retrofit Strategy Preliminary Draft

REPORT CONTRIBUTORS

This report was prepared by Darseen Pooni, Climate Action and Energy Officer and Joanna Cheng, Climate Action and Energy Officer, and reviewed by Erica Lay, Manager Climate Action and Energy, Carl Isaak, Director Community Planning, and Lee-Ann Garnett, Deputy General Manager Planning and Development.

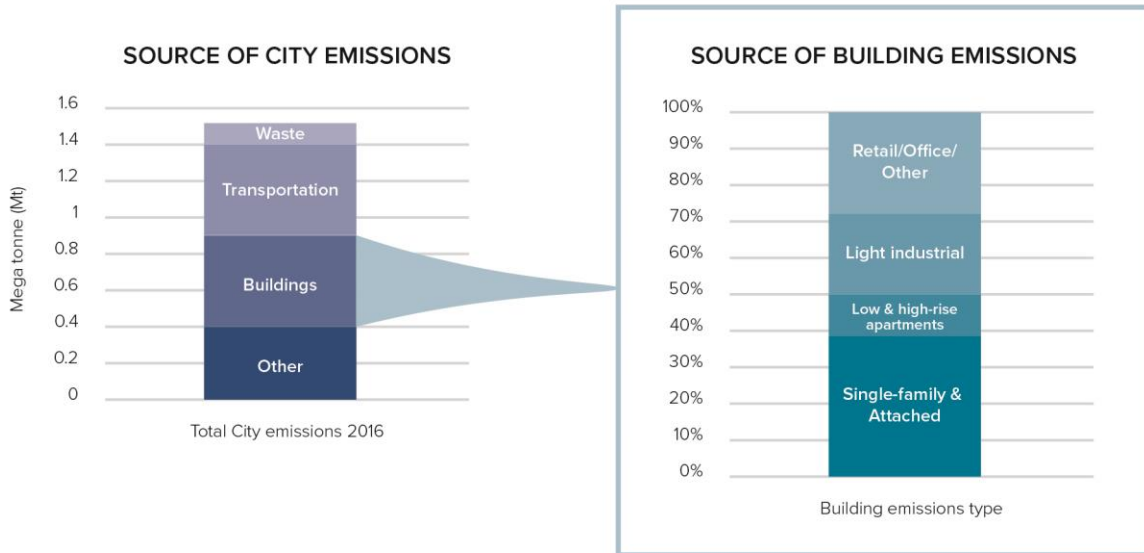


Figure 1 - Sources of City Emissions and Building Emissions Makeup

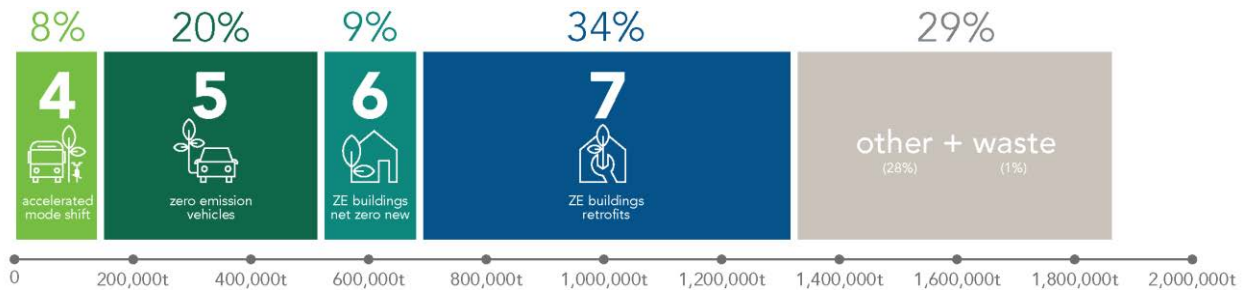


Figure 2 - Allocation of carbon emission reductions by Big Move, to 2050. Retrieved from Climate Action Framework

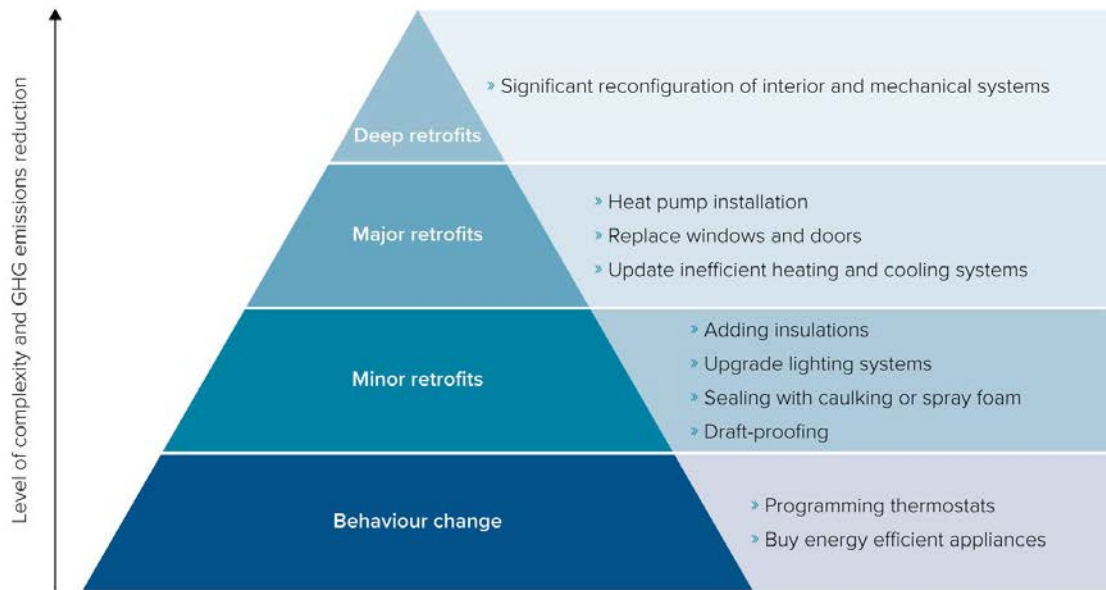


Figure 3- Types of building retrofits and corresponding levels of complexity and GHG emissions reduction. Content adapted and modified from <https://natural-resources.canada.ca/energy-efficiency/buildings/existing-buildings/retrofitting/20707>

ZE Building Retrofit Strategy Preliminary Draft

<i>Objective: To enhance resident and building owner retrofit and energy efficiency literacy.</i>			
1 Education & Outreach	Targeted Actions for the City	Implementation Timeline	Cost
	1. Deliver multi-sectoral and multi-lingual awareness campaign	Immediate	\$\$
	2. Retrofit city-owned buildings to lead by example	Medium-term	\$\$\$
	3. Organize energy efficiency and retrofit demonstrations and workshops	Medium-term	\$\$
	4. Support industry capacity building	Long-term	\$
<i>Objective: To provide financial and process support to encourage public adoption of retrofit work.</i>			
2 Incentives	1. Partner with existing concierge retrofit programs/accelerator programs who provide retrofit support to residents going through the retrofit process (e.g. Home Energy Advisor, Empower Me)	Immediate	\$\$\$
	2. Provide top-ups to existing retrofit incentive programs for electrification measures	Short-term	\$\$\$
	3. Reduce permit barriers and costs	Immediate	\$
	4. Work with other municipalities to explore bulk purchasing options for heat pumps and other mechanical systems to bring down costs and secure availability of technology	Medium-term	\$
<i>Objective: To reduce City policy and bylaws barriers that hinder retrofit adoption.</i>			
3 Policy & Bylaws	1. Explore options to incorporate carbon emissions reductions for existing buildings in building bylaws	Immediate	\$
	2. Explore options to amend noise bylaws to support heat pump installations	Immediate	\$
	3. Explore options to amend zoning bylaws to support heat pump installations	Immediate	\$
	4. Explore policy and standards on mandatory benchmarking, water and space heating efficiency and fuel switching requirements	Medium-term	\$
<i>Objective: To engage with other orders of government to advance regulatory tools and supports for retrofit work.</i>			
4 Advocate	1. Support regional regulation on benchmarking and energy disclosure	When applicable	\$
	2. Explore advocacy with the Provincial Government to amend the Strata Property Act to include zero-emissions retrofits and energy upgrades in a building's depreciation report	When applicable	\$
	3. Support the Provincial adoption of PACE (Property Assessed Clean Energy) Financing ⁱ	When applicable	\$
	4. Support the Provincial adoption of Highest Efficiency Equipment Standard ⁱⁱ	When applicable	\$

 = Priority Actions

ⁱ PACE programs allow property owners to finance the up-front costs of energy upgrades on a property and then pay the costs back over time through a property tax assessment. This loan is registered to the property title not to the owner and can be repaid in installments added to property taxes over the lifespan of the retrofit. The Province has identified PACE as a priority to drive adoption of energy efficiency and low carbon building retrofits. Information retrieved from <https://www.ubcm.ca/convention-resolutions/resolutions/resolutions-database/provincial-enabling-property-assessed-clean>

ⁱⁱ The Highest Efficiency Equipment Standard is a provincial commitment to explore future requirement for all new heating and hot-water equipment sold and installed in BC to exceed 100% efficiency since space and water heating systems are primary drivers to GHG emissions from a building. Information retrieved from CleanBC Roadmap to 2030 - The Province of British Columbia