



RETROFITTING NORTH VANCOUVER: LARGE BUILDING ANALYSIS AND BEST PRACTICE REVIEW FOR THE CITY OF NORTH VANCOUVER

EXECUTIVE SUMMARY

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Disclaimer

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This project was conducted under the mentorship of City of North Vancouver staff. The opinions and recommendations in this report and any errors are those of the author and do not necessarily reflect the views of City of North Vancouver or the University of British Columbia.

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Introduction

The City of North Vancouver, motivated by a vision of becoming a low-carbon, resilient city, has put forward ambitious goals to significantly decrease emissions. These goals include reducing emissions by 80% below 2007 levels by 2040, and achieving net-zero emissions by 2050. To accomplish these goals, a key focus on retrofitting large existing buildings is crucial. While considerable strides have been made in terms of new constructions and low-density housing, it's clear that further attention must be placed on high-density housing and large buildings, known as Part 3 buildings. Considering that 75% of the City's residential units are found in multi-family buildings, the development of a focused strategy for these buildings is of utmost importance.

Background

Large existing buildings in the City of North Vancouver, specifically high-density housing and what are known as Part 3 buildings, represent a substantial area for carbon emissions reduction. Acknowledging this, the City has established two primary objectives to drive its carbon neutrality ambition. The first is to gain a comprehensive understanding of the City's high-density housing and large building inventory by identifying opportunities for low-carbon and resilient retrofits. The second is to study and learn from retrofit policies and programs implemented by cities that are leading in this area. The insights derived from these objectives will inform the City's strategy for retrofitting large structures, particularly multi-family buildings, making a significant contribution to the City's climate goals.

Research Approach

The project's methodology employed a two-pronged approach. The first aspect was the comprehensive study of the City's high-density housing and large building inventory, aiming to identify potential opportunities for low-carbon and resilient retrofits. The second aspect involved learning from retrofit policies and programs implemented by other cities leading in this domain.

To achieve these objectives, the study devoted significant effort towards updating and streamlining the City's database of large multi-family buildings. Using recent building permit data and the BC Assessment website [1], the existing database was thoroughly reviewed and updated.

This newly refined database can now classify the City's Part 3 building stock by size and use, representing a crucial step in identifying key buildings suitable for energy-efficient, sustainable renovations.

Simultaneously, a detailed review of retrofit policies and programs for Part 3 buildings in British Columbia was conducted. This review was intended to inform the City's approach to retrofitting large buildings. Numerous plans and programs relevant to Part 3 building retrofits in British Columbia emerged from the review, including the Practice Advisory by Engineers and Geoscientists BC [2] and the District of Saanich's Building Retrofit Strategy [3].

In 2022, Engineers and Geoscientists BC released a Practice Advisory titled "Electrical Considerations for Decarbonizing Existing Part 3 Buildings". The document emphasizes that building owners should consider decarbonization when retrofitting existing Part 3 buildings. Particularly, it highlights cases where building owners can leverage incentives from federal, provincial, local, or utility-provider rules or programs for energy-efficiency improvements or greenhouse gas cuts. It underlines the need for potential permitting requirements in retrofitting projects, and the importance of recent updates to the BC Electrical Code in this context. The advisory stresses the importance of engaging with utility providers early in the process. This can help to mitigate unexpected delays and costs associated with changes or upgrades to electrical infrastructure during retrofitting. Furthermore, it discusses the impact of retrofitting on utility costs and rates, and how energy modeling could help project these changes. The advisory recommends considering decarbonization when retrofitting building systems that might affect the building's electrical demand or top load, when installing renewable energy systems like solar PV technology, and when assessing or implementing energy efficiency, building envelope, or structural improvements. Finally, it provides details on the incorporation of electric vehicle (EV) charging infrastructure in the retrofitting process, and suggests various technological considerations, such as heat pumps, energy management systems, on-site renewable installations and battery storage, and electric appliances.

In May 2023, the District of Saanich set out a Building Retrofit Strategy, describing how to achieve GHG cut and hardiness targets for existing buildings. The strategy identifies several high-impact

actions set for priority over the next three years. These include carbon and energy marking and reporting for Part 3 buildings, a revitalization tax exemption to encourage electrification in commercial and multi-family buildings, and collaborating with the Building Owners and Managers Association (BOMA) and the Greater Victoria 2030 District to create a climate risk review framework for existing Part 3 buildings. It also emphasizes the need for ongoing advocacy for comprehensive coverage in federal, provincial, and utility incentive programs. Medium-impact actions include the potential implementation of a Carbon Performance Standard (CPS) to regulate emissions in existing Part 3 buildings, working with the Open Green Building Society to provide access to Building Benchmark BC, a voluntary energy and carbon marking program, and exploring opportunities for Part 3 buildings to secure funding through project bundling or private investment.

Recommendations

To improve the City of North Vancouver's retrofitting strategy for Part 3 buildings, the following recommendations are proposed:

1. **Develop Zero Carbon Transition Plans:** Encourage building owners to devise zero carbon transition plans for each of their assets. The City can assist in this process by providing guidelines or templates.
2. **Promote High-Performance Enclosure Upgrades:** The City can generate incentives to encourage building owners to implement high-performance enclosure upgrades, which can significantly reduce energy demand.
3. **Implement Mandatory Building Performance Requirements:** Introduce mandatory building performance requirements to ensure all buildings achieve a specified level of energy efficiency.
4. **Standardize the Retrofit Market:** Collaborate with governmental bodies and building owners to standardize the deep carbon retrofit market, which may include the development of common definitions, practices, and standards for retrofits.

5. **Establish Financial Incentives:** In recognition that the financial case for deep carbon retrofits is less established than for energy efficiency retrofits, the City could offer financial incentives, such as grants, low-interest loans, or tax credits, to encourage these retrofit projects.
6. **Promote Education and Awareness:** Increase awareness about the importance and benefits of deep carbon retrofits among building owners and the general public, potentially through workshops, seminars, or public awareness campaigns.
7. **Support Business Model Innovation:** Encourage innovative business models that can drive the market transformation necessary for widespread adoption of deep carbon retrofit projects.

References

1. BC Assessment. [Online]. Available: <https://www.bcassessment.ca>. [Accessed: 25-Jul-2023]
2. Engineers and Geoscientists British Columbia, *Practice Advisory - Electrical Considerations for Decarbonizing Existing Part 3 Buildings*, 16-Jun-2022. [Online]. Available: <https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMW5K7OKYS6AQCZFYXR4QVJBNKNMH/Electrical%20Considerations%20for%20Decarbonizing%20Existing%20Part%203%20Buildings>. [Accessed: 28-Jul-2023]
3. District of Saanich, *Building Retrofit Strategy*, 01-May-2023. [Online]. Available: <https://www.saanich.ca/assets/Local-Government/Documents/Committees-and-Boards/SCA/Agendas/2023-05-17-Building-retrofit-strategy.pdf>. [Accessed: 28-Jul-2023]