Image source: City of Coquitlam

UBC Sustainability Scholar Report:

Research on designing and retrofitting energy-efficient Fire Halls

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Disclaimer

This report was produced as part of the UBC Sustainability Scholars Program, a partnership between the University of British Columbia and various local governments and organizations in support of providing graduate students with opportunities to do applied research on projects that advance sustainability across the region.

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

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Executive summary

Energy-efficient designs and retrofits have been identified as key measures to reduce energy consumption and associated greenhouse gas (GHG) emissions from the building sector in Canada. In the City of Coquitlam, the City aims to reduce GHG emissions by 45% by 2030 and 100% by 2050 compared to the 2007 levels. City-owned buildings account for over 40% of GHG emissions. Therefore, integrating energy-efficient and low-carbon technologies into both new and existing civic facilities represents a critical strategy for achieving the City's climate targets for 2030 and 2050. This project aims to develop strategies for the City of Coquitlam to advance the implementation of energy-efficient design and retrofit strategies for civic facilities, with a particular focus on Fire Halls. According to the literature review, local industry professional interviews, and energy data analysis, this report summarizes key strategies to improve the energy efficiency of Fire Halls and reduce GHG emissions.

Energy-efficient design measures for new Fire Halls include:

- Heat pump systems
- Heat recovery ventilators
- Heat pump water heaters
- Solar Photovoltaic panels

Energy-efficient retrofit measures for existing old Fire Halls include:

- Airtightness blower door test
- Air sealing with caulking or spray foam
- Weatherstripping for doors and windows
- Heat pump systems and heat recovery ventilators (budget permitting)

In summary, this report can be used for developing energy-efficient design and retrofit strategies for Fire Halls in the City of Coquitlam or other municipalities.

1 Introduction

Extensive use of fossil fuels and associated greenhouse gas (GHG) emissions have been identified as catalysts for climate change and associated environmental impacts [1]. It is suggested that fuel combustion in buildings, transportation, and fugitive sources constitute 82% of the GHG emissions in Canada [2]. In response to the increasing concerns about climate change impacts, the governments of Canada and British Columbia have established targets to reduce GHG emissions by 30% and 40% below 2007 levels by 2030, respectively [3]. In the City of Coquitlam (the City), the City aims to reduce GHG emissions by 45% by 2030 and 100% by 2050 compared to the 2007 level, outlined in the Environmental Sustainability Plan [4].

In Canada, buildings are responsible for 28% of total energy end use and contribute to 26% of the country's GHG emissions [5]. Thus, the building sector has gained some municipalities' attention for the need to reduce energy consumption and GHG emissions. In the City of Coquitlam, City-owned buildings contribute more than 40% of corporate GHG emissions, and opportunities to incorporate energy-efficient and low-carbon technologies into new and existing civic facilities will play a significant role in helping the City reach its 2030 and 2050 climate targets [4].

The objective of this project is to provide the City of Coquitlam with recommendations to plan and implement energy-efficient design and retrofit measures for civic facilities, with particular emphasis on Fire Halls. This report mainly consists of six sections. Section 2 conducts a literature review of the City's existing policy and plans, Fire Hall information, industry examples, and energy-efficient design and retrofit measures, while Section 3 summarizes the main findings from local industry professional interviews. Then, Section 4 analyzes energy and emission data of existing Fire Halls in the City. Based on the literature review and interview findings, Section 5 provides key strategies for designing and retrofitting energy-efficient Fire Halls in the City.

2 Integrative review

This section reviews the City's policy and plans, Fall Hall information, successful industry examples, and energy-efficient design and retrofit measures for Fire Halls.

2.1 City's Policy, Plans, and Technical Studies

This section provides a review of the City's policy, plans, and technical studies to help readers understand the City's sustainability goals and actions. The reviewed documents mainly consist of the Climate Adaptation Strategic Plan (CASP) [7], Environmental Sustainability Plan (ESP) [4], Municipal Green Building Guideline Scan [8], and Major Facilities Roadmap [9].

The City of Coquitlam Council introduced CASP in 2020 to assess and address the impacts of climate change on infrastructure, services, and community well-being. CASP prioritizes actions across seven key risk categories: *Drought, Wildfires, Heat Waves, Water Shortages, Inland Flooding, Coastal Flooding, and Storm Events*. In particular, for civic buildings, more frequent heatwaves in summer will increase cooling energy demand and total energy consumption. After recognizing the importance of climate change impacts, City Council approved the ESP in 2022, which is structured around five thematic areas: *Climate Action, Built Environment, Waste Management, Water Management, and Natural Areas*. The plan provides a clear and flexible framework to help guide future decisions, ensuring the long-term resiliency and sustainability of the community. In the *Built Environment* area, ESP articulates key actions, Action 46: upgrade, retrofit, and apply cost-effective climate adaptive measures to aging civic facilities; and Action 47:

develop sustainable design guidelines for new civic buildings to reduce energy consumption and GHG emissions [4]. In alignment with the key strategies outlined in ESP, the City has explored green building design guidelines from other municipalities (the Municipal Green Building Guideline Scan) to inform an energy-efficient approach for designing and retrofitting City-owned civic buildings [8]. Finally, the City approved the Major Facility Roadmap to guide long-term civic infrastructure investment and renewal. In particular, the Roadmap outlines the renewal timeline of Austin Heights Fire Hall in 2025-2035 and a new fire hall in southeast Coquitlam planned for 2045 [9]. The City's Roadmap and project sequencing are summarized in the Appendix Tables A1 and A2.

2.2 Asset review

This section conducts a review of the Fire Hall archetype and describes the characteristics of the City's existing Fire Halls, with the main focus on the Austin Heights Fire Hall to be renewed in the upcoming 10 years (as outlined in the Major Facilities Roadmap). Fire Halls are dedicated facilities that serve as the base of operations for fire and rescue services. These facilities are critical to public safety, providing the resources, infrastructure, and personnel needed to respond to emergencies effectively. A Fire Hall mainly consists of the following components:

1. **Apparatus Bay**:
    - Houses fire engines, ladder trucks, ambulances, and other emergency vehicles.
    - Includes equipment storage and maintenance areas.
2. **Administrative and Operational Spaces**:
    - Offices for fire chiefs and administrative staff.
    - Dispatch centres for coordinating emergency responses.
3. **Living Quarters**:
    - Dormitories, kitchens, and recreational areas for on-duty firefighters.
    - Designed for 24/7 operations.
4. **Training Facilities**:
    - On-site training rooms or outdoor spaces for drills and simulations.
    - Equipment for fitness and physical preparedness.
5. **Community Outreach Areas**:
    - Spaces for community education and fire safety programs.

Currently, the City of Coquitlam has four Fire Halls: Austin Heights, Mariner, Town Centre, and Burke Mountain, as summarized in Table 1.

Table 1: Summary of Fire Halls in the City

	Austin Heights Fire Hall	Mainer Fire Hall	Town Centre Fire Hall	Burke Mountain Fire Hall
Year built	**1985**	**1987**	**1987 (expended in 2011)**	**2011**
Area (square meter)	**1486**	**1672**	**3107**	**1629**

Location	**428 Nelson Street**	**775 Mariner Way**	**1300 Pinetree Way**	**3501 David Avenue**

In this report, we mainly focus on the Austin Heights Fire Hall that will be renewed in the upcoming years. The Austin Heights Fire Hall (1486 square meter), located at 428 Nelson Street, Coquitlam, BC, serves as a key facility for emergency response, including firefighting, hazmat operations, and community outreach. The station, constructed in 1985, supports the Austin Heights neighbourhood and surrounding areas with equipment, including fire engines, hazmat units, and ladders. The Fire Hall, located in a rapidly growing population area, is critical for fire suppression, medical emergencies, and hazard mitigation [10]. Retrofitting the Austin Heights Fire Hall will ensure its continued functionality, improve energy efficiency, and align with the City's sustainability and public safety goals.

Figure 1. Austin Heights Fire Hall

2.3 Industry examples

This section presents successful industry examples of energy-efficient Fire Halls, including Vancouver Fire Hall No.17 [14], Richmond Brighouse Fire Hall No.1 [12], Richmond Steveston Fire Hall No.2 [12], and North Vancouver Maplewood Fire & Rescue Centre [13].

Vancouver Fire Hall No.17

- Year built: 2022
- Location: 7070 Knight Street, Vancouver
- Building area: 1800 m^2
- Features: CaGBC Zero Carbon Building Design, LEED Gold, Passive House certification
- Energy-efficient designs: GSHP, Heat recovery ventilator, Solar PV panels, Heat pump water heater, LED lighting system

Image source: City of Vancouver

Richmond Brighouse Fire Hall No.1

- Year built: 2018
- Location: 6960 Gilbert Road, Richmond
- Building area: 2345 m^2
- Features: LEED Gold
- Energy-efficient designs: ASHP, Heat recovery ventilator, Solar PV panels,

Image source: City of Richmond

Richmond Steveston Fire Hall No.2

- Year built: 2011
- Location: 11011 No. 2 Road, Richmond
- Building area: 840 m^2

- Features: LEED Gold
- Energy-efficient designs: GSHP, Heat recovery ventilator, Solar domestic water pre-heat system, Green roofs, Occupancy sensors

Image source: City of Richmond

North Vancouver Maplewood Fire & Rescue Centre

- Year built: 2022
- Location: 2410 Dollarton Hwy, North Vancouver
- Building area: 4180 m^2
- Features: 71% reduction in energy use and a 92% reduction in GHG emissions compared to the existing Fire Hall
- Energy-efficient designs: ASHP, Heat recovery ventilator, Solar PV panels, Heat pump water heater, Occupancy sensors

Image source: District of North Vancouver

2.4 Technical literature review

This section provides a technical review of potential energy-efficient design and retrofit measures for Fire Halls. These measures can be mainly grouped into three clusters: passive measures, active measures, and renewable measures, which are illustrated as follows.

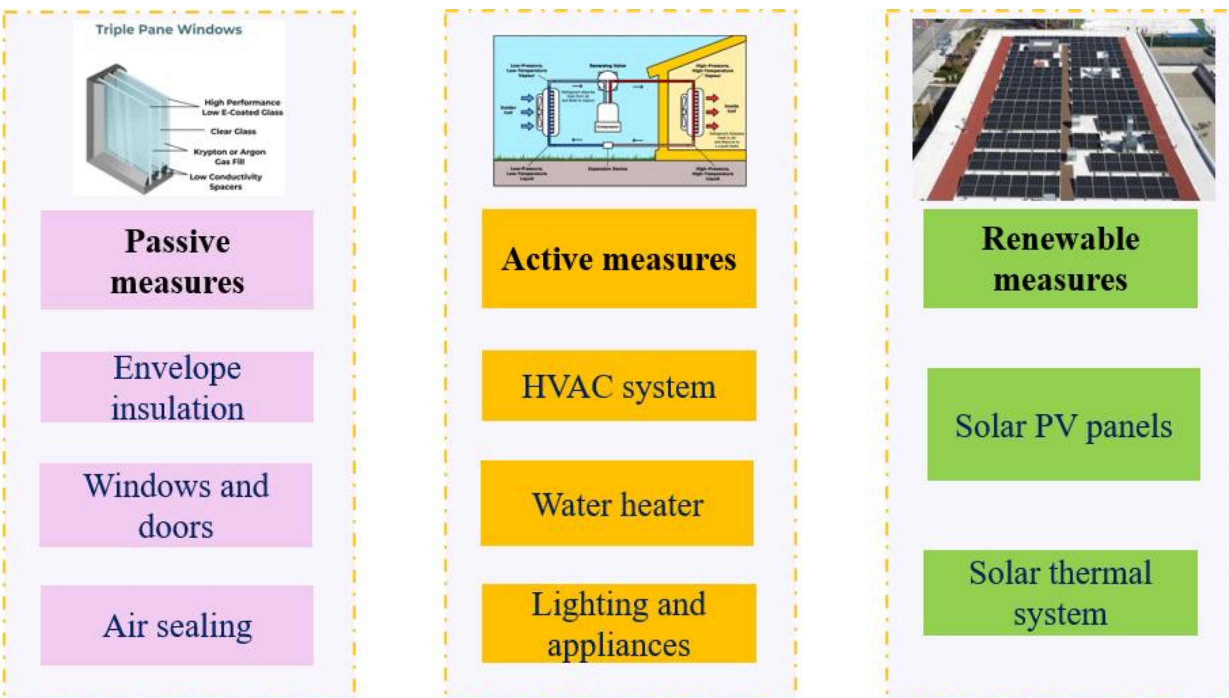


Figure 2. Energy-efficient Design and Retrofit measures

Passive measures: Heat losses or gains through building envelopes affects building energy consumption [11]. Upgrading building envelopes, such as airtightness, external wall insulation, ceiling insulation, windows, and exterior doors can reduce space heating or cooling energy losses to outdoors and reduce building energy consumption. Furthermore, heat gains can be reduced in

Summer with green roofs to save cooling energy consumption for Fire Halls, such as the Richmond Steveston Fire Hall No.2 [12].

Active measures: These measures involve the installation, upgrade, or replacement of energy-consuming systems or equipment to improve efficiency and reduce energy demand, such as upgrades in Heating, Ventilation, and Air Conditioning (HVAC) systems, lighting systems, and appliances in Fire Halls. Heat pump systems, including air-source heat pumps (ASHP) and ground-source heat pumps (GSHP), are highly energy-efficient HVAC systems for Fire Halls space heating and cooling. For example, the North Vancouver Maplewood Fire & Rescue Centre installs ASHP combined with other systems to achieve 71% reduction in energy use and a 92% reduction in GHG emissions compared to the existing Fire Hall [13]. Furthermore, Richmond Steveston Fire Hall No.2 installs GSHP for space heating and cooling and achieves the LEED Gold certification [12].

Renewable measures: Renewable energy solutions, such as solar photovoltaics (PV) panels, are alternative energy systems to produce on-site electricity for Fire Halls. The generated electricity can be exported to the grid to receive credits from utility companies and reduce energy costs. For example, the Richmond Brighouse Fire Hall No.1 installs solar PV panels on the rooftop, which can save approximately $7,000 in electricity bills per year. The total installation cost is $17,5000, and the estimated payback period is 24.5 years [12]. In addition, solar thermal systems can use solar energy for hot water heating. For example, Richmond Steveston Fire Hall No.2 installs a solar domestic water pre-heat system for water heating [12].

3 Local Industry Professionals Interviews

To learn about the benefits of energy-efficient design and retrofit measures, potential challenges, and solutions for Fire Halls, the scholar and the City's staff conducted interviews with HCMA leading architects who have participated in several energy-efficient Fire Hall designs, North Vancouver building operation managers, and the City of Coquitlam facility maintenance team. Three interviews were conducted virtually in July 2025. A summary of each of the interviews is provided in the Appendix Tables A3-A5. We identify the challenges of the existing old Fire Hall (Austin Heights Fire Hall). Then, we summarize the lessons learned from interviewees. Finally, we summarize successful energy-efficient and climate-friendly design and retrofit measures for Fire Halls in Section 5.

Based on our discussions with local industry professionals, the existing Fire Halls face several challenges, including:

- **Aging infrastructure**: With legacy building designs, the Fire Hall may not meet contemporary building codes or performance standards for energy efficiency.
- **Energy efficiency, sustainability, and resilience**: The Fire Hall lacks modern energy-efficient mechanical systems and has low airtightness, leading to higher operational energy consumption and increased environmental impact, and the HVAC system may not be able to operate well during extreme weather events (e.g., heat waves).
- **High energy-intensive components:** The Fire Hall's high energy-intensive components include heating systems, ventilation systems, and appliances to wash and dry gears

- **24/7 operation**: HVAC systems continue to run despite some areas being unoccupied during certain parts of the day.
- **High cooling demand in summer:** Staff prefer low cooling temperature setpoints (e.g., 19 degrees Celsius) in dormitory rooms, resulting in huge cooling energy demand in summer.

The lessons learned from the interviewees:

- Heating the truck itself and keeping the heat in Apparatus Bays can save heating energy consumption in Winter
- Reducing the heating temperature setpoint (e.g., 10 degrees Celsius) in the Apparatus Bays is beneficial for energy savings
- Setting temperature setbacks during unoccupied hours (e.g., recreational or dormitory rooms) can reduce energy wastage.
- Keeping the same temperature for different rooms is beneficial for energy savings.
- Envelope enhancement is less important than HVAC systems for new Fire Hall designs since new Fire Halls have well-insulated envelopes, as a result of contemporary building code requirements; however, improving airtightness is essential for existing old Fire Halls due to many leakage areas in old Fire Halls.

4 Energy and Emission Data Analysis

This section analyzes the monthly electricity and natural gas consumption of the four Fire Halls in the City. Figure 3-6 depicts the energy consumption of the four Fire Halls in the City of Coquitlam. The columns represent the electricity consumption, while the lines indicate natural gas consumption.

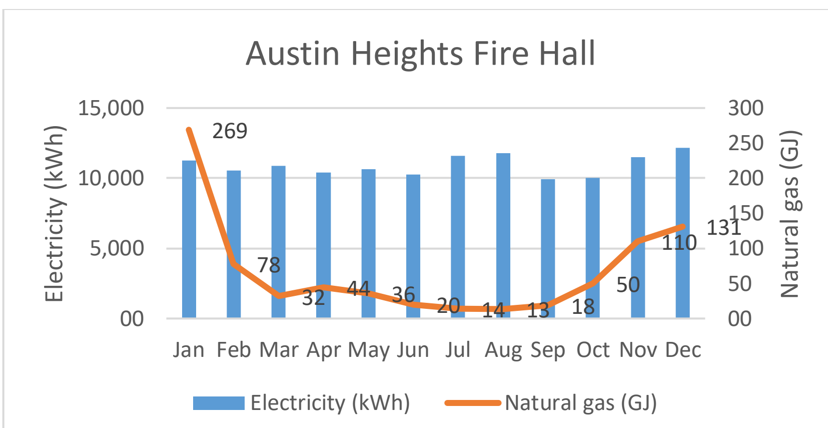


Figure 3. Energy Consumption of the Austin Heights Fire Hall

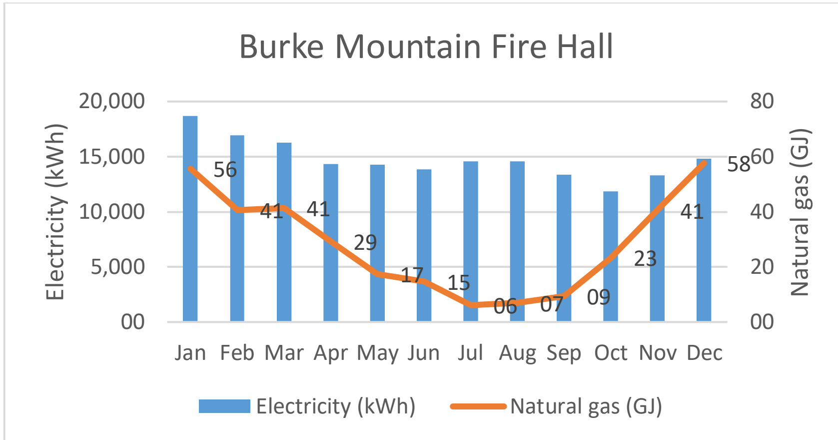


Figure 4. Energy Consumption of the Burke Mountain Fire Hall

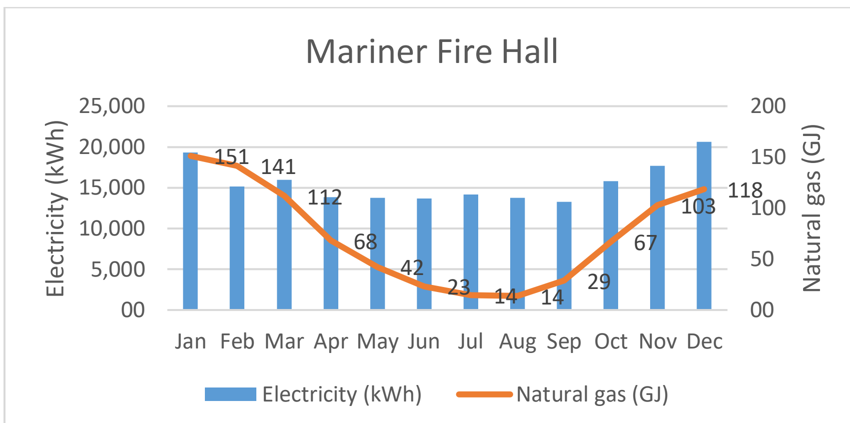


Figure 5. Energy Consumption of the Mariner Fire Hall

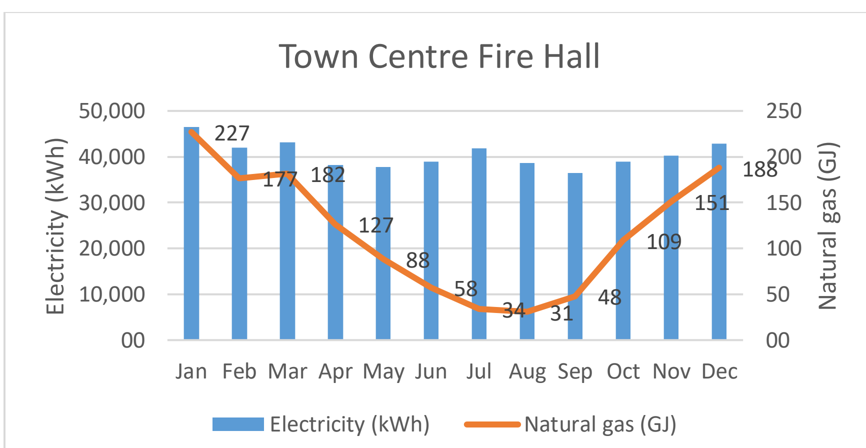


Figure 6. Energy Consumption of the Town Centre Fire Hall

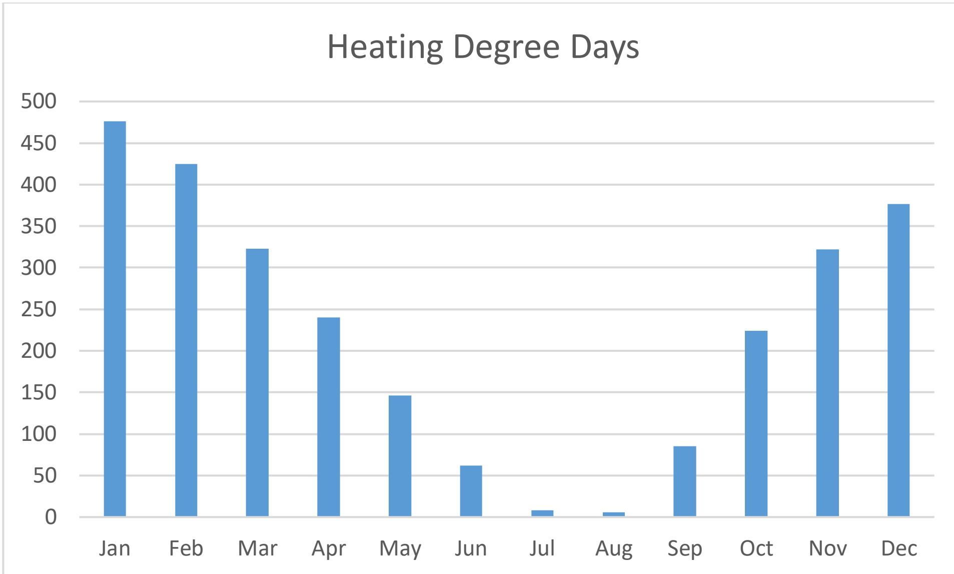


Figure 7. Heating Degree Days

Figures 3-6 indicate that electricity consumption remains relatively stable throughout the year. This relatively consistent profile suggests a steady base electrical load for lighting, equipment, and other plug loads. In contrast, natural gas usage exhibits significant seasonal variability because of the monthly variation in Heating Degree Days, as shown in Figure 7. It peaks in January and remains elevated during the winter months, reflecting high heating demand. Additionally, this report also compares the total energy consumption of the four Fire Halls with the Richmond Brighouse Fire Hall, a fire hall built to high energy efficiency standards, as shown in Figure 8.

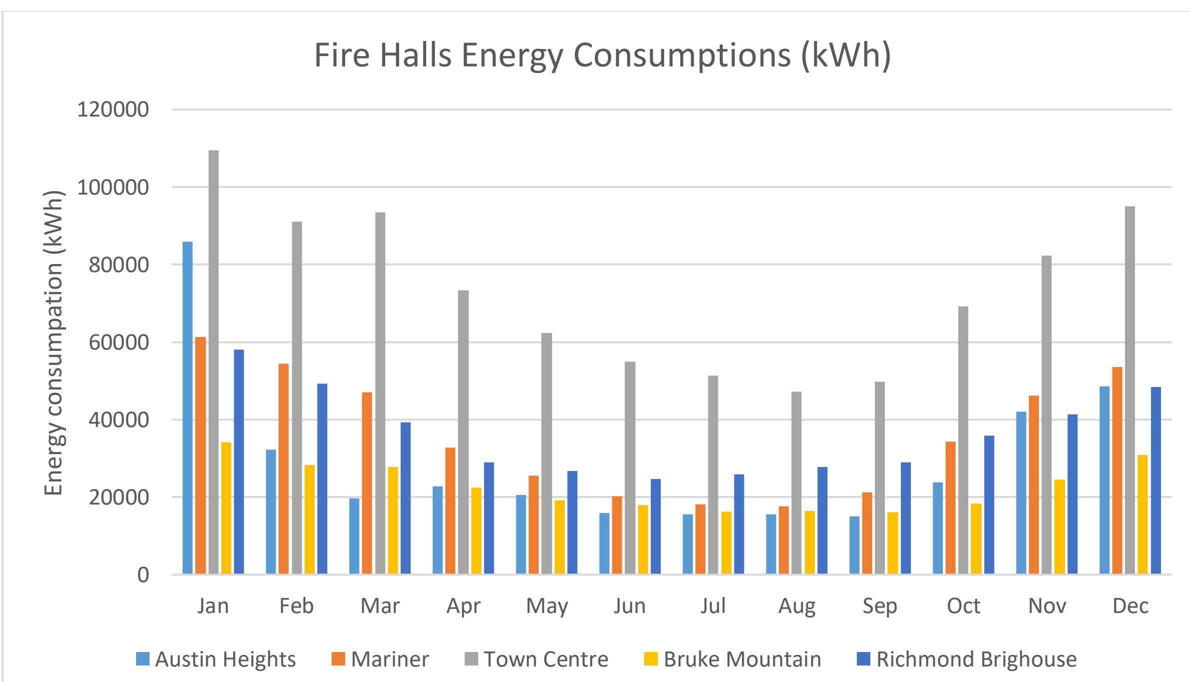
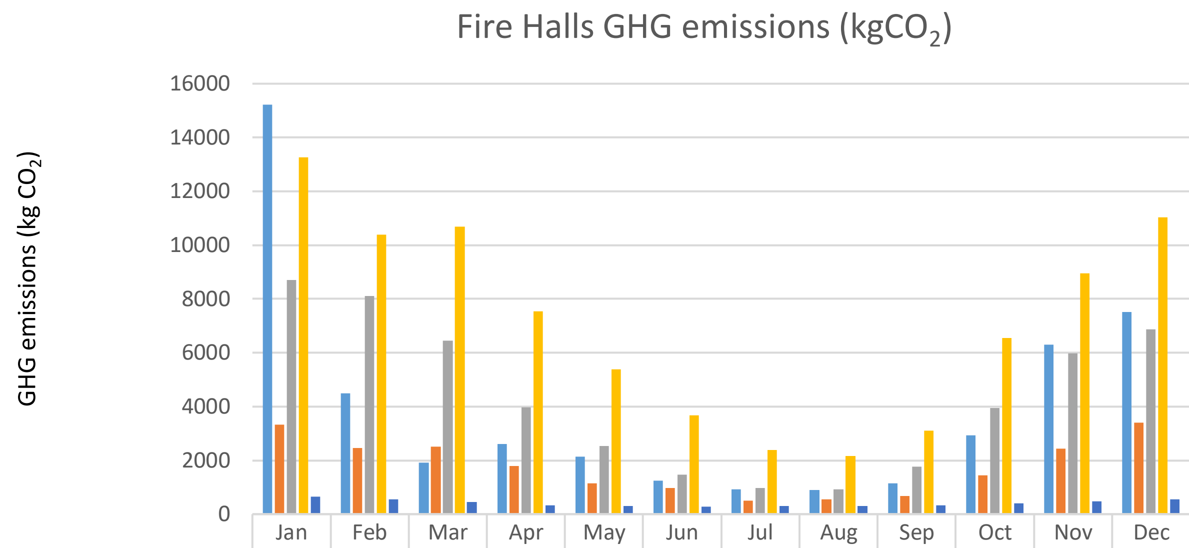


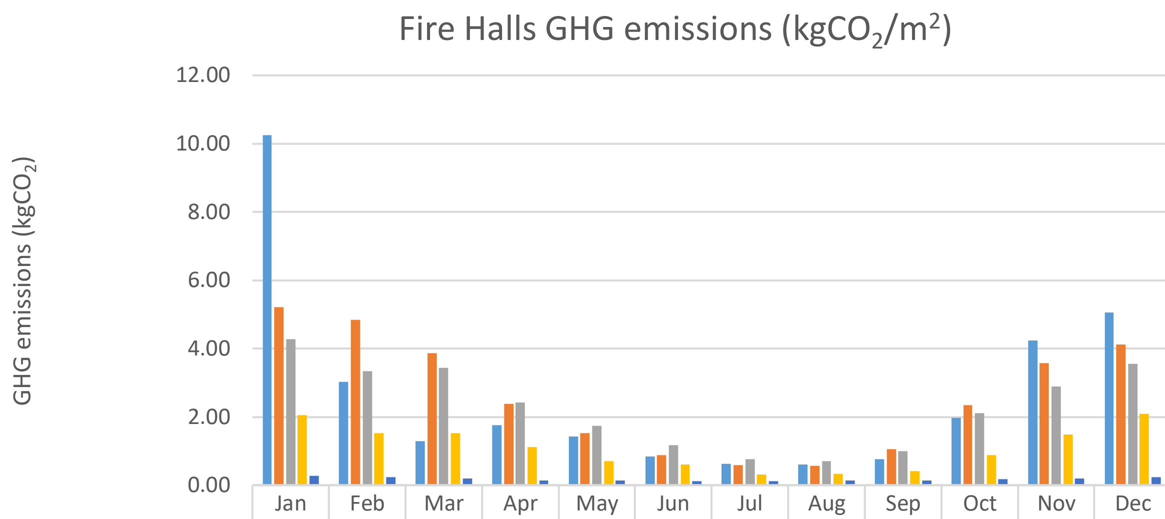
Figure 8. Energy Consumptions of Coquitlam's Fire Halls in Comparison to Richmond Brighouse Fire Hall



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Austin Heights	15219	4500	1909	2605	2129	1243	919	887	1142	2920	6290	7507
Bruke Mountain	3338	2471	2497	1801	1141	976	507	550	680	1440	2422	3402
Mariner	8701	8108	6460	3968	2532	1458	971	932	1773	3933	5976	6879
Town Centre	13262	10382	10678	7531	5387	3668	2380	2172	3108	6549	8949	11028
Richmond Brighouse	657	557	444	328	302	280	293	313	328	405	467	547

Figure 9. GHG emissions of Coquitlam's Fire Halls in Comparison to Richmond Brighouse Fire Hall

Based on the energy consumption data, we calculated the total GHG emissions from the five Fire Halls, as shown in Figure 9. Austin Heights, Mariner, and Town Centre Fire Halls exhibit higher GHG emissions in winter compared to Burke Mountain Fire Hall. This is because Burke Mountain Fire Hall was constructed in 2011, with higher energy-efficiency HVAC systems and envelopes compared to the other three Fire Halls. Additionally, Richmond Brighouse Fire Hall produces the lowest GHG emissions since it uses heat pump systems for heating, fully supported by electricity. To consider the impact of building area on GHG emissions, we also present the GHG emissions per square meter for the five Fire Halls, as shown in Figure 10.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Austin Heights	10.24	3.03	1.28	1.75	1.43	0.84	0.62	0.60	0.77	1.97	4.23	5.05
Mariner	5.20	4.85	3.86	2.37	1.51	0.87	0.58	0.56	1.06	2.35	3.57	4.11
Town Centre	4.27	3.34	3.44	2.42	1.73	1.18	0.77	0.70	1.00	2.11	2.88	3.55
Bruke Mountain	2.05	1.52	1.53	1.11	0.70	0.60	0.31	0.34	0.42	0.88	1.49	2.09
Richmond Brighouse	0.28	0.24	0.19	0.14	0.13	0.12	0.12	0.13	0.14	0.17	0.20	0.23

Figure 10. GHG Emissions of Coquitlam's Fire Halls in Comparison to Richmond Brighouse Fire Hall (per square meter)

5 Strategies for Designing and Retrofitting Energy-efficient Fire Halls

This section provides strategies for designing new Fire Halls and retrofitting existing old Fire Halls, respectively.

5.1 Designing new energy-efficient Fire Halls

According to our interview results and the successful industry examples, we summarize the energy-efficient design measures for new Fire Halls. As new building standards regulate high envelope insulation and airtightness, passive measures are less important than active and renewable measures. Therefore, the key energy-efficient design measures for new Fire Halls include heat pump systems, heat recovery systems, solar PV panels, and water heater heat pumps, as shown in Figure 10.

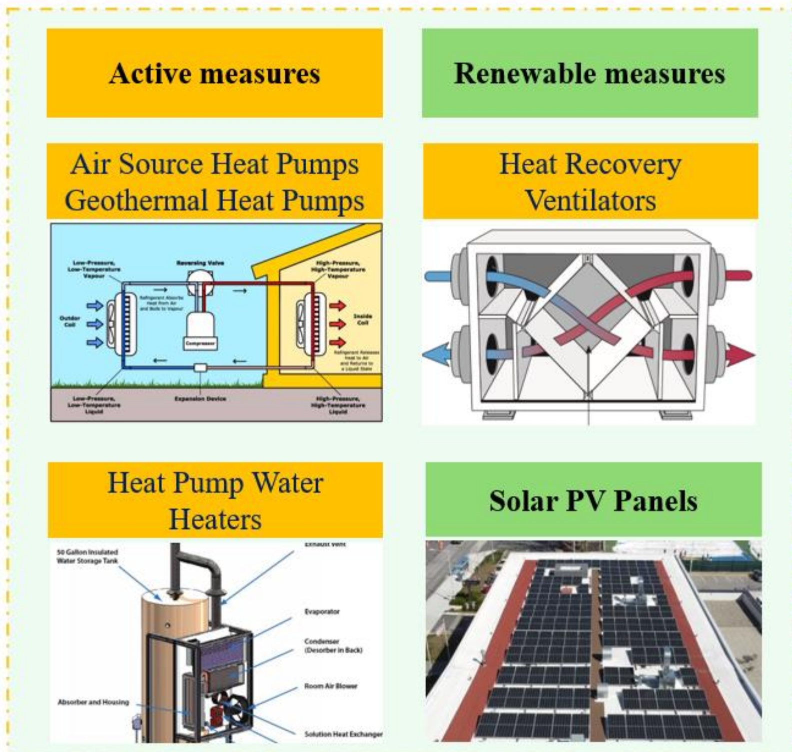


Figure 11. Energy-efficient Design Measures for New Fire Halls

5.2 Retrofitting existing old Fire Halls

Different from new Fire Halls' designs, retrofitting existing old Fire Halls should consider the deterioration of building envelopes and air leakage. Based on the aforementioned analysis, this report provides a pathway for retrofitting existing old Fire Halls, as shown in Figure 11.

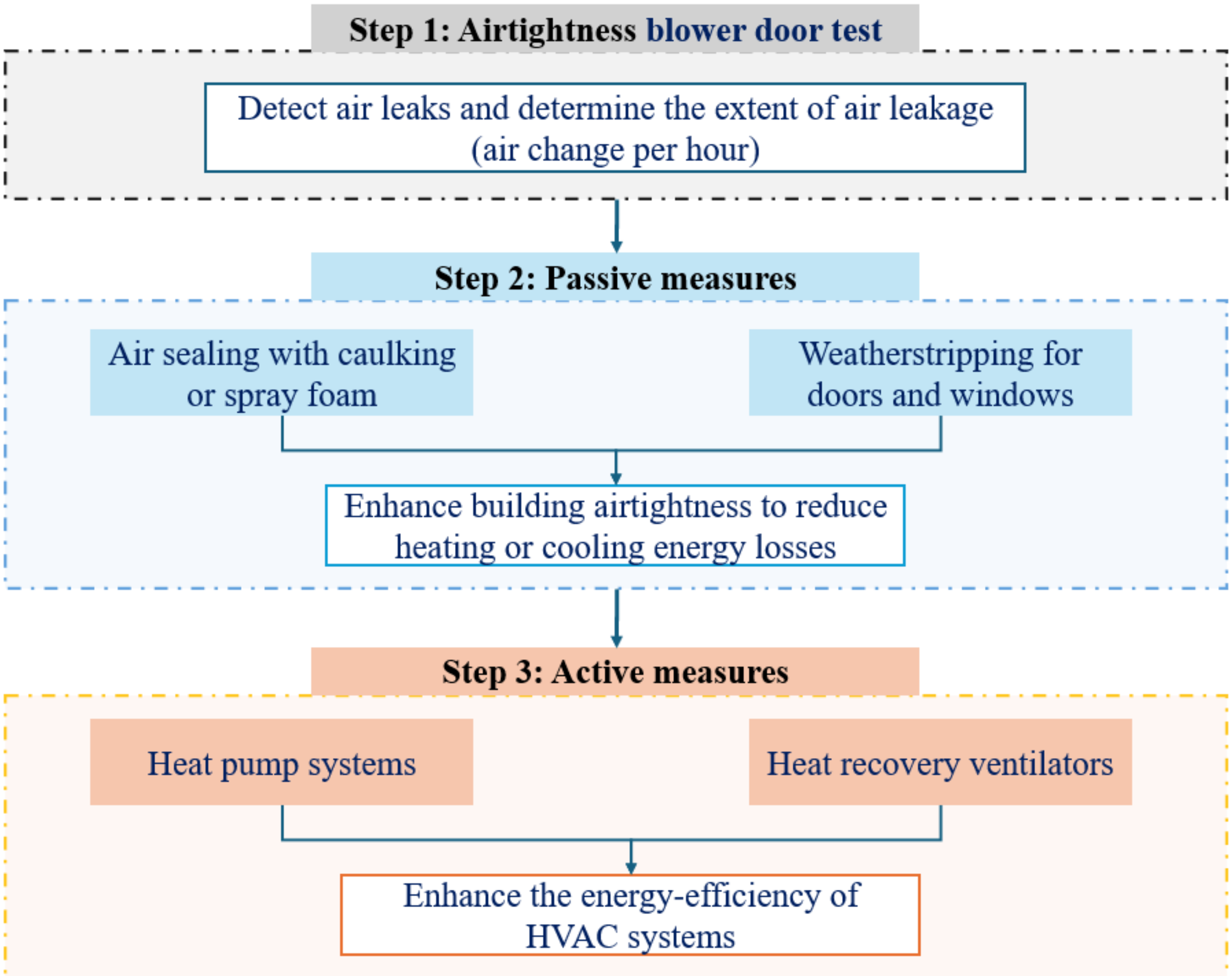


Figure 12. Energy-efficient Retrofit measures for old Fire Halls

As shown in Figure 11, the first step is to detect air leaks and determine building airtightness through a blower door test. Building airtightness refers to the resistance of a building envelope to unintentional airflow (infiltration) through cracks, joints, and other openings. A blower door test can identify air leakage areas. Then, we can apply caulk, air-sealing materials, and weatherstripping for walls, roofs, doors, and windows to prevent air escaping from these envelopes, thereby reducing heating or cooling energy losses to outdoors. Finally, if the budget permits, it is suggested to install heat pump systems and heat recovery systems to improve the energy efficiency of HVAC systems.

It should be noted that this project mainly focuses on qualitative analysis based on the literature review and interviews to identify key design and retrofit strategies for Fire Halls. Further quantitative analysis should be conducted in future work. For example, the energy savings and the corresponding cost benefits for each of the design and retrofit strategies should be further investigated.

6 Conclusions

City of Coquitlam has established an ambitious target to reduce GHG emissions by 45% by 2030 and 100% by 2050 compared to the 2007 level. In the City of Coquitlam, City-owned buildings contribute more than 40% of corporate GHG emissions. Energy-efficient design and retrofit measures are essential for reducing energy consumption and associated GHG emissions of new and existing civic facilities to meet the targets outlined in the City's policy and plans. This research aims to investigate key energy-efficient design and retrofit strategies for the City's civic facilities with a particular focus on Fire Halls.

This project includes a review of policy and plans in the City, Fire Hall information, industry examples, and applicable energy-efficient design and retrofit measures to outline the overall City's plans and explain the need for improving the energy efficiency of Fire Halls. Then, this project interviews local industry professionals to inform successful energy-efficient design and retrofit experience and analyzes the energy and emission data of Fire Halls. Finally, this report provides key strategies for designing energy-efficient new Fire Halls and retrofitting old Fire Halls in the City of Coquitlam.

Future work should quantify the energy savings and cost benefits for the proposed energy-efficient design and retrofit strategies for Fire Halls. In summary, this report can be beneficial for the City to plan and implement energy-efficient design and retrofit strategies for Fire Halls to reduce energy consumption and GHG emissions and meet the targets outlined in the City's policy and plans.

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Appendix

Table A2: Summary of the City's major facilities roadmap

Principle	Key points
1–Maintaining Existing Aging Facilities	- Significant investment needed for aging facilities. - Some buildings date back to early 1900 and exceed original design capacities. - Plan carefully for maintaining or replacing facilities. - Focus on long-term community benefit.
2–Enhance and Expand Existing Facilities	- 40% of facilities predate the 1990s, designed for outdated needs. - Modernize to meet current regulations. - Continuously assess and upgrade building conditions. - Prioritize asset management, with full renewals as needed.
3–Build New Facilities to Meet Growth Needs	- Meet recreation, culture, and civic needs. - New facilities needed alongside renewals. - Planned facilities: Northeast Community Centre and Library, Fraser Mills Community Centre, Austin Heights Fire Hall renewal. - Plan for funding and location.
4 –Facility Aspirations and New Opportunities	- Adapt to population growth and trends over 30 years. - Partner with organizations for new facilities. - Integrate public amenities for vibrant urban life. - Foster innovation in design and services.

Table A3: Summary of the City's project sequencing

Category	2025-2035	2035-2045	2045+
Aquatics Services	- New Northeast Community Centre - New Fraser Mills Community Centre	- CCAC and Eagle Ridge Pool	
Sports and Recreation Services	- Planet Ice - Blue Mountain Park Fieldhouse - Town Centre Park Facility Phase 1	- Future Ice Facilities - Town Centre Park Facility Phase 2	- New Athletic Park Facility (Gilley's Trail Park)
Arts and Culture	- New Burquitlam Library - New Southwest Arts & Heritage	- Poirier Library	- Poirier West Community Facilities (Poirier Precinct) - New City Centre Cultural Centre - City Centre Library
Civic Service and Public Safety	- Austin Heights Fire Hall - New Northeast Community Police Office	- Austin Works Yard Phase 2 - New Southwest Fire Hall	- City Hall / RCMP - Southwest Community Police Office

Table A3: Summary of the 1st interview with HCMA leading architects

Interview with HCMA leading architects	
Interview objectives	Understand the most effective energy design or retrofit measures to reduce the Fire Hall's energy consumption and carbon footprint.
High energy intensive components	• Heating systems • Ventilation systems (high ventilation rates) • Appliances to wash and dry gears
Energy efficiency challenges	• 24/7 operation, keep running HVAC during unoccupied period • Irregular occupancy patterns • Legacy building designs (many Fire Halls equip with less energy-efficient mechanical systems and low airtightness)
Successful measures	• Geothermal heat pumps • Air source heat pumps • Heat recovery ventilator • Volatile organic compound sensors • Variable air volume box to control ventilation rate of individual rooms • Envelope insulation or air barriers between zones with different indoor temperature setpoints • Occupancy sensors
Lessons learned	• Keep the same indoor temperature • Heat the truck itself and keep the heat in Apparatus Bays • Reduce the heating temperature setpoint (e.g., 10 degrees Celsius) in the Apparatus Bays • Envelope enhancement is less important than HVAC systems for new Fire Hall designs • Embodied emissions (e.g., manufacturing building construction materials will lead to emissions) can be reduced through low-carbon concrete and mass timber

Table A4: Summary of the 2nd interview with North Vancouver energy manager

Interview with North Vancouver energy manager	
Interview objectives	Understand possible operational problems, and how to save energy during the operation stage.
Energy efficiency challenges	• Huge cooling demand in summer due to low cooling temperature setpoint in dormitory rooms • 24/7 operation, keep running HVAC during unoccupied period • Staff have limited awareness of energy efficiency
Successful measures	• Air source heat pumps • Electric boilers for back-up heating systems • Heat recovery ventilator • Variable air volume box • Solar Photovoltaics (offset part of the energy consumption) • Heat pump water heaters • High-resolution occupancy sensors • Emergency generator connected to HVAC systems
Lessons learned	• Keep the same temperature for different rooms • Concerns with noise issues due to fan coil units in training rooms • Indoor air quality can be significantly improved through new building designs

Table A5: Summary of the 3rd interview with the City facility maintenance team

Interview with the City facility maintenance team	
Interview objectives	Understand staff's needs and priorities and energy efficiency challenges
Staff's expectations from retrofitted Fire Halls	• Maintain comfortable indoor temperature (e.g., 19 degrees in summer) • A desire for a separate, automatic control temperature system
Energy efficiency challenges	• Keep HVAC system running during unoccupied period • Low cooling temperature setpoint in dormitory rooms
Successful measures	• Airtightness testing and improvement (cost-effective option) is essential for existing old Fire Halls • Envelope (e.g., roof) insulation • Windows

	• Lighting control
Lessons learned	• Temperature setbacks during unoccupied hours (e.g., recreational rooms) can save energy consumption