WARRINGTON PCI MANAGEMENT: COMPLIANCE STRATEGIES UNDER THE CITY OF VANCOUVER ANNUAL GREENHOUSE GAS AND ENERGY LIMITS BY-LAW

A CASE STUDY | APRIL 2026

BOMA BRITISH COLUMBIA

wpm WARRINGTON PCI MANAGEMENT

TABLE OF CONTENTS

Executive Summary **3**

Introduction **4**

Case Study Framework **5**

Building Case Studies **6**

805 West Broadway 7

Key Measure: Domestic hot water electrification 7

Next steps 7

900 Howe Street 8

Key Measures: Re-commissioning the DDC logic 8

Next steps 8

Key Findings and Conclusions **9**

805 West Broadway

EXECUTIVE SUMMARY

This case study examines how two Warrington PCI-managed commercial buildings in Vancouver responded to emerging regulatory exposure under the City of Vancouver's greenhouse gas performance standards. Both buildings were trending above the City's initial emissions limits and faced potential compliance costs, yet neither were positioned for major capital retrofits within the 2026 timeframe. Therefore, near-term, practical actions were undertaken to reduce emissions and manage regulatory requirements.

At both buildings, emissions reductions were achieved through a combination of low- to moderate-effort measures, including optimization of existing building controls, targeted operational improvements, and select electrification projects. While the scale and complexity of interventions varied by building, the findings demonstrate that meaningful greenhouse gas (GHG) reductions can often be realized without wholesale system replacement, particularly where building automation systems and operational practices have not been fully optimized.

Most measures were implemented in 2025, and the results presented reflect estimated energy and emissions impacts based on early performance data and engineering analysis. In addition to emissions reductions, several actions delivered favourable paybacks through operating cost savings. The buildings are also pursuing complementary strategies – such as low-carbon thermal energy procurement – to further reduce emissions beyond the measures documented here.

Collectively, the case study highlights practical compliance pathways available to building owners in advance of major capital cycles, while underscoring that deeper retrofits and long-term planning will be required to meet future, more stringent limits.

INTRODUCTION

The City of Vancouver (COV) officially enacted its **Annual Greenhouse Gas and Energy Limits By-law** in **July 2022** to regulate operational greenhouse gas (GHG) emissions and heat energy intensity (HEI) in large existing buildings. The by-law establishes mandatory annual **energy and carbon reporting** requirements for **commercial and multi-family residential buildings** with a gross floor area (GFA) ≥ **50,000 ft^2**.

Building upon this reporting framework, the by-law further applies **performance-based emissions limits** to a more limited subset of the building stock. Specifically, **existing office and retail buildings** with a gross floor area ≥ **100,000 ft^2** are subject to mandatory **GHG intensity (GHGI)** limits beginning **January 1, 2026**, with thresholds that become progressively more stringent through **2040**, as follows:

a. **25 kg CO_2e/m^2 of GFA** for office buildings after January 1, 2026;

b. **14 kg CO_2e/m^2 of GFA** for retail buildings after January 1, 2026; and,

c. **0 kg CO_2e/m^2 of GFA** for both office and retail buildings, effective January 1, 2040.

In addition, the by-law establishes a **heat energy intensity** limit targeting fossil fuel–based thermal energy use. **This HEI limit applies to the same ≥ 100,000 ft^2 office and retail buildings**, and is set at **0.09 GJ/m^2 of GFA** for both commercial and retail buildings starting in **2040**.

900 Howe Street

As one of the first regulations of its kind in Canada, the City of Vancouver has worked widely across the sector to ensure affected buildings are informed, understand the requirements, and have access to the tools needed for compliance. This work included in-person and online presentations, webinars, newsletters, regular updates on program progress, and meetings and follow-up with buildings exceeding the bylaw limits to discuss progress and options for reducing their GHG emissions.

Additional City resources include the Energize Vancouver reporting map, which displays reporting information for buildings subject to the by-law, as well as guides, training videos, available support programs, and incentives published on the Energize Vancouver website.

Direct industry support is also provided by the BOMA BC Decarb Accelerator program, which provides technical and strategic support to office and retail building owners and operators, throughout the Province of BC, to help reduce greenhouse gas emissions, improve energy performance, and navigate emerging regulatory requirements. **Several Warrington PCI Management (WPM) buildings have been participants in the BOMA BC Decarb Accelerator program. This case study highlights two in particular, 805 West Broadway and 900 Howe Street**, and the measures implemented to bring them into compliance with the City's GHG By-law.

A timeline of the by-law reporting and performance requirements is detailed below:

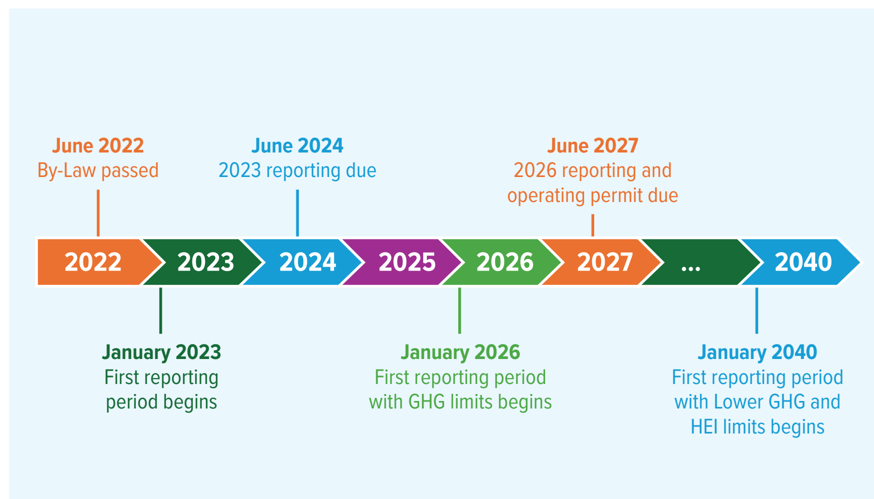


Figure 1. COV by-law reporting and limits timeline for commercial Office and Retail Buildings over 100,000 ft^2

CASE STUDY FRAMEWORK

This case study examines two WPM buildings in Vancouver that were operating above the **2026 GHGI limits** and facing near-term emissions overage fees. **The buildings reflect common conditions faced by many office buildings subject to these regulations**, including aging systems, reliance on fossil fuel–based heating, and misalignment between major retrofit needs and near-term capital planning cycles.

NEAR-TERM COMPLIANCE CONSTRAINTS

For many buildings, major mechanical retrofits are not feasible within the 2026 timeframe, as existing equipment and systems have not reached end-of-life and do not align with approved 2026 capital plans. Despite these constraints, building owners and operators are seeking to avoid emissions overage fees associated with their GHGI overages while continuing to plan for longer-term decarbonization.

As a result, near-term compliance strategies have focused on **measures that can be implemented using existing infrastructure**, limited capital investment, and short implementation timelines.

*Note: Strategies required to meet the more stringent **2040 limits** are not addressed in this case study and will likely involve deeper retrofits and longer-term planning to transition buildings toward full electrification.*

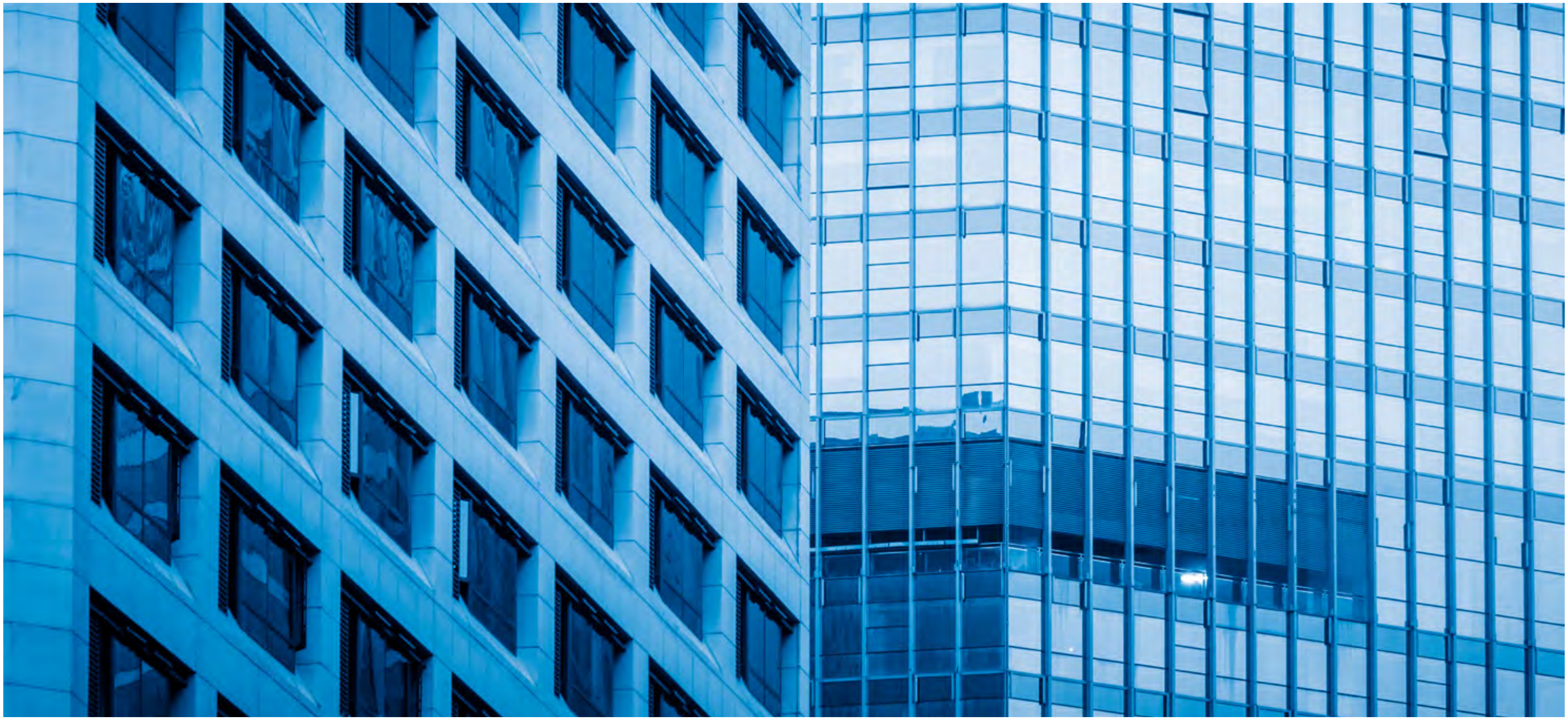
MEASURE TYPOLOGY

Based on projects implemented to date, these measures generally fall into three categories:

- **Controls optimization:** Enhancements to existing building systems through the building automation system (BAS), including supply air temperature resets, VAV box and damper repairs, and implementation of unoccupied setpoints.
- **Operational improvements:** Minor capital upgrades involving limited equipment modifications and no major system replacement, such as installing variable-frequency drives (VFDs) on pumps and fans.
- **Capital investments:** Targeted electrification projects, such as domestic hot water system electrification, intended to achieve deeper GHG reductions than controls and operational measures alone.

ASSESSMENT APPROACH

Most measures documented in this case study were implemented in 2025. Reported **results reflect estimated energy and GHG impacts** based on early performance data, utility comparisons, and engineering analysis. In addition to emissions reductions, the case study evaluates **utility cost impacts and avoided City of Vancouver emissions overage fees** associated with GHGI reductions.



BUILDING CASE STUDIES

The case study framework showcases **two WPM commercial buildings within the City of Vancouver**, each with distinct system configurations, emissions profiles, and compliance challenges. For each building, the analysis summarizes baseline performance, key measures implemented, estimated GHG reductions, and next steps toward compliance.

Table 1 summarizes the **gross floor area (GFA)** and **GHGI** of the two case study buildings based on 2023 utility data, along with the reduction required for each to meet the 2026 GHGI limit.

Table 1. GFA and GHGI of the buildings in this case study

BUILDING	GFA (FT^2)	GHGI (kg CO_2e/ m^2/year)	GHGI reduction required to meet the 2026 limit (% of building's emissions)	GHG Emissions reduction required to meet the 2026 limit (tonnes of CO_2)
805 West Broadway	125,000	34	26%	103
900 Howe Street	118,000	33	24%	87

805 WEST BROADWAY

805 W. Broadway is a 125,000 ft^2, 18-storey medical office building located in Vancouver's **South Granville** neighbourhood, constructed in the **early 1970s**. Space heating is provided by **two natural gas-fired boilers**—one condensing and one non-condensing—which serve both the building's hydronic heating loops and air handling units. Domestic hot water (DHW) is produced by **natural gas-fired equipment** and stored in multiple tanks distributed throughout the building.

Based on historical consumption, the building has a **GHGI of 34 kg CO_2e/m^2/year**, requiring a **26% reduction** to comply with the **2026 GHGI limits**. To address this gap, the primary measure implemented to date has been **electrification of the domestic hot water system**.

KEY MEASURE 1: DOMESTIC HOT WATER ELECTRIFICATION

Background

DHW electrification is often a lower-complexity decarbonization strategy compared to space-heating electrification, with relatively modest upfront capital requirements and fewer implementation constraints. While DHW systems typically represent a smaller share of total building GHG emissions than space heating, electrifying these systems can still deliver meaningful emissions reductions, often with shorter payback periods.

Electric DHW systems generally fall into two categories:

- **Electric resistance water heaters**, which use electric elements to directly heat water. These systems are relatively simple and have lower upfront capital costs but are less energy efficient.
- **Heat pump water heaters (HPWHs)**, which use a refrigeration cycle to heat water and can achieve a **coefficient of performance (COP) of 2 to 4**, depending on system design and operating conditions. While significantly more energy efficient and lower carbon, HPWHs typically require higher upfront investment as well as sufficient mechanical space and ventilation.

Measure Description

At 805 W. Broadway, domestic hot water is supplied by **two sets of 200-gallon storage tanks** located in the **mechanical penthouse** and the **main floor mechanical room**. All four tanks were previously heated indirectly by the building's boilers via **immersion coils** installed within each tank.

Domestic hot water piping

To electrify the DHW system, the storage tanks were **decoupled from the natural gas–fired boilers** and replaced with **electric resistance water heaters**. The estimated upfront capital cost for fully electrifying the DHW system was approximately **$100,000**.

Next Steps

Given the building's baseline GHGI, DHW electrification alone is **not sufficient** to achieve compliance with the **2026 GHGI limit**. The measure is estimated to reduce the building's **natural gas consumption by 18%**, lowering the building's GHGI to approximately **28 kg CO_2e/m^2/year** and avoiding an estimated **$25,000 in City of Vancouver emissions overage fees**.

To close the remaining compliance gap, additional measures are under evaluation, including the **procurement of renewable natural gas (RNG)** and the implementation of **recommissioning measures** aimed at further reducing GHG emissions and bringing the building below the 2026 limit.

900 HOWE STREET

900 Howe St. is a 118,000 ft^2, 10-storey office building located in downtown Vancouver. The building is connected to a natural gas-fired **district energy system** (DES). Steam, supplied to the building from the DES, is converted to hot water and used for space heating via **air handling units (AHUs)** serving the lower floors and **variable air volume (VAV) boxes** serving perimeter office areas. Domestic hot water is provided by **electric storage tanks** located throughout the building.

Based on **2023 utility data**, the building has a **GHGI of 33 kg CO_2e/m^2/year**, requiring a **24% reduction** to meet the **2026 GHG emissions limit**. Measures implemented at the building have focused on **recommissioning and direct digital control (DDC) optimization** to reduce steam consumption.

KEY MEASURE 1: RECOMMISSIONING DDC LOGIC

Background

This project focused on reducing steam consumption through targeted DDC optimization and recommissioning. While several electricity-saving measures—including chiller control optimization—were also identified and implemented, they are not discussed here, as they had minimal impact on steam consumption.

Measure Description

- **AHU supply air temperature control improvements:** Cooling coils on AHUs were slow to respond to demand, resulting in overcooling. Cooling valve control was tuned to improve responsiveness, reducing both **electricity consumption for cooling** and **steam consumption** previously required to reheat overcooled spaces.
- **VAV operation corrections:** Several VAV boxes were found to be in heating mode while heating coil valves remained closed, and many were unable to meet airflow setpoints even with dampers fully open. In addition, temperature sensor faults were identified, including implausible readings (e.g., **-47 °C or 154 °C**). This measure involved calibrating airflow and temperature sensors and repairing or replacing faulty dampers and valves across affected VAV boxes.
- **AHU unoccupied settings:** Outdoor air dampers were programmed to close during unoccupied periods and reopen during occupied hours. This maintains required ventilation while reducing energy use associated with conditioning outdoor air during unoccupied periods.

Heating system pumps

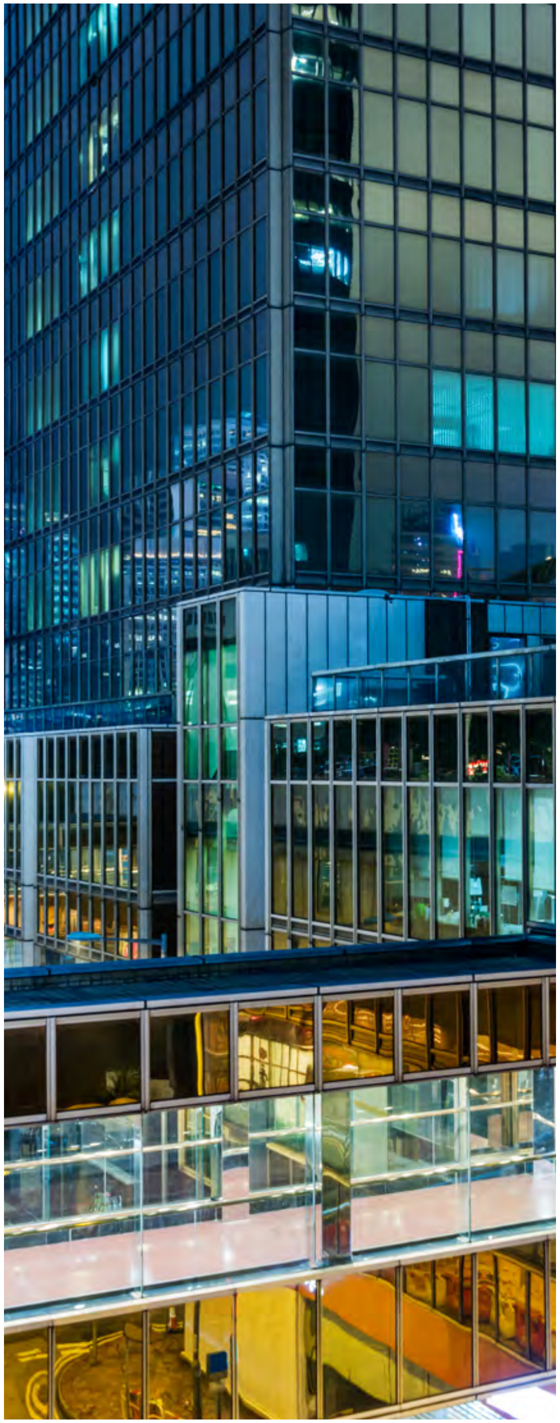
- **Unoccupied shutdown of heating water pumps:** DDC logic was revised to allow heating water pumps to shut down during unoccupied periods. Pumps now start if any floor temperature falls below **16 °C** and stop when the minimum floor temperature exceeds **18 °C**. Pumps are programmed to run continuously when outdoor air temperature falls below **3 °C**.

Performance Outcomes

These measures, combined with other DDC optimizations implemented as part of the project, are expected to **reduce steam consumption by 11%**, with a **payback period of less than three years**. In addition to utility cost savings, the measures are estimated to avoid approximately **$14,000 in City of Vancouver emissions overage fees** by lowering the building's GHGI to **30 kg CO_2e/m^2/year**.

Next Steps

Building operations are currently being monitored to verify savings from the DDC optimization project. Additional capital measures, including installation of a **heat recovery chiller**, are under investigation for near-term implementation to further reduce their GHG emissions.



KEY FINDINGS AND CONCLUSIONS

To comply with the City of Vancouver's Annual GHG emissions by-law, commercial buildings across Vancouver are implementing a range of measures to reduce energy use and associated GHG emissions. This case study examines two WPM buildings subject to the by-law that were operating above the **2026 GHGI limit**, and documents the measures implemented to reduce emissions and manage compliance risk.

Table 2 summarizes the measures implemented across the two buildings and their estimated GHG savings.

BUILDING	MEASURE LIST	**Estimated GHG Savings** (% of building GHG emissions)	**Estimated GHG Savings** (tonnes of CO_2)
805 West Broadway	Domestic hot water electrification.	18%	72
900 Howe Street	AHU supply air temperature control improvements; VAV operation corrections; AHU unoccupied settings; unoccupied shutdown of heating water pumps.	11%	40

Table 2. Summary of measures implemented at both buildings

The measures selected varied by building, reflecting differences in existing system operation, emissions reduction potential using current equipment, and alignment with capital planning cycles. Controls optimization, operational improvements, and targeted upgrades were initially pursued to reduce GHGI and support near-term requirements. The results demonstrate that **significant emissions reductions can be achieved with relatively low capital output**.

At both buildings, many of the earliest and most cost-effective gains were realized through **improved system operation and DDC optimization**, without requiring major equipment replacement. In addition to lowering GHGI, these measures reduced utility costs, delivered favourable payback periods, and helped buildings avoid City of Vancouver emissions overage fees – reinforcing the value of near-term operational strategies as a bridge to longer-term decarbonization pathways.

For other buildings subject to the City of Vancouver's GHG emissions limits, this case study illustrates that **meeting early thresholds does not necessarily require major retrofits**. Substantial reductions can be achieved by leveraging existing systems more effectively – through recommissioning, DDC optimization, and targeted operational adjustments – often at low cost and with short payback periods. These examples highlight the value of prioritizing measures that can be implemented within current capital cycles, using available building automation capabilities and incremental upgrades to reduce emissions, manage risk, and defer larger investments until they align with longer-term decarbonization planning.

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