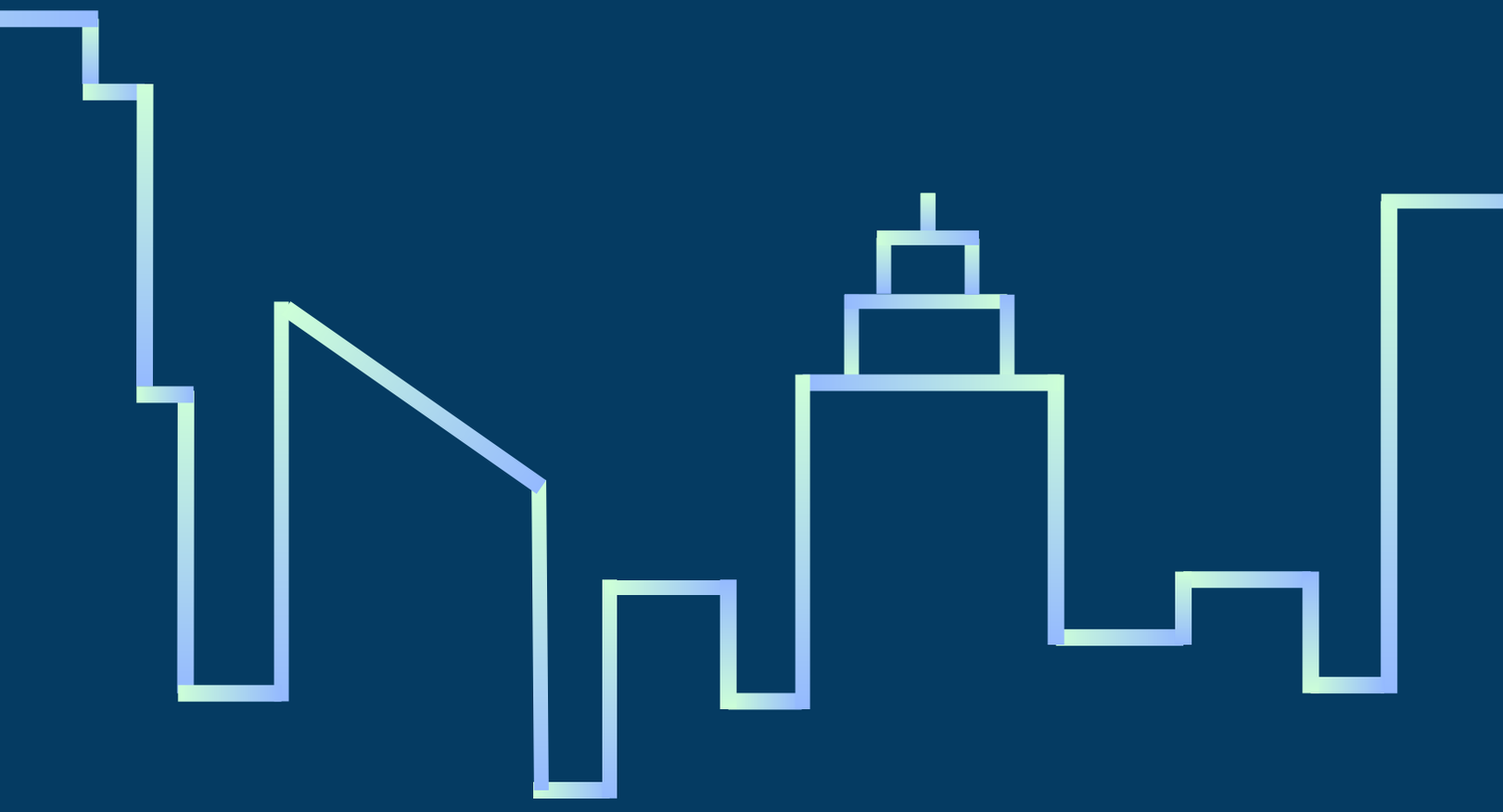
RARA CASE STUDY

CITY OF VANCOUVER

LANDLORDBC



CASE STUDY

A Step Toward Net Zero

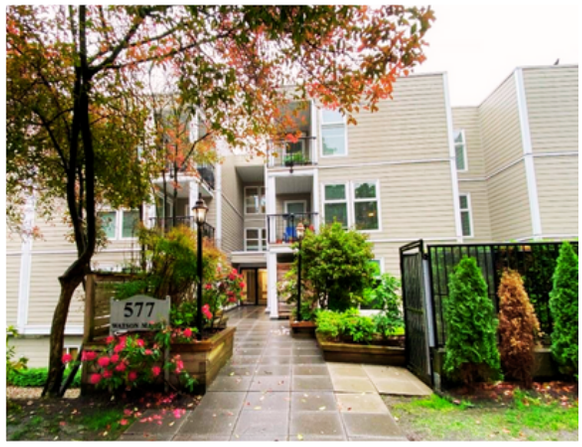
Domestic Hot Water Electrification and Demand Response:

Third Space Properties - 577 E 8th Avenue, Vancouver

RARA Case Study

Watson Manor

Third Space Properties



Retrofit Overview

To support their Net Zero Transition Plan, Third Space Properties replaced an at end-of-life gas-fired domestic hot water system (DHW) with a high-efficiency electric CO_2 heat pump system. The retrofit marks a significant milestone in the company's decarbonization efforts – it is the first 100% electric and Zero Carbon Performance Building in their portfolio and the first to integrate automated demand response (ADR) functionality.

CO_2 Heat Pumps

Hot Water Storage Tanks

Project Highlights

Heat Pump: Droplet 6 (six SANCO2 heat pump units).

Refrigerant: CO_2 (R-744). With global warming potential (GWP) of 1, CO_2 has dramatically lower GWP than conventional refrigerants like R-410A or R-134A.

Demand Response Capabilities:

- A CTA-2045 heat pump controller enables smart grid communication with BC Hydro for demand response and load shifting.
- An increase in hot water storage from 480 to 720 gallons enables the system to heat water during off-peak electrical demand hours and store that water for use during peak periods.

The Right Team

- This retrofit was a collaboration of Third Space Properties with City of Vancouver and CleanBC funding, LandlordBC project leadership, Haakon for mechanical contracting, BC Hydro for demand response pilot, and FRESCo for engineering and implementation support.

Building Details

Year built: 1983

Building size (sq ft): 31,412

Number of units: 39

ENERGY STAR® certification rating: 99

Location: Mount Pleasant, Vancouver, BC

The Numbers

421 GJ
annual gas saved

$1,825
annual utility savings

370 tC02e
lifetime emissions avoided

"To achieve our Planet commitment and reach net zero, we need electrification projects like this that move the needle, even if they cost more than like-for-like gas replacements."

Leo Glaser, Third Space Properties

"Watson Manor demonstrates that full DHW electrification can be achieved without major electrical upgrades when the system is properly sized to balance heat pumps, storage, and building demand."

Cameron Eggen, Haakon, Contractor

"CO_2 heat pumps are highly efficient, electric, and rated for cold climates, requiring no backup heating in the Lower Mainland. Using CO_2 refrigerant (R-744), ozone-safe and ultra-low Global Warming Potential (GWP), they are more climate-friendly than conventional refrigerants."

Frank Lee, FRESCo

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Watson Manor

Third Space Properties

Costs & Funding

Electrification retrofits can come with higher upfront cost compared to like-for-like gas boiler system replacements, particularly in early stages of innovative retrofit equipment adoption. In this case, for similar out-of-pocket costs (after incentives) to a new gas boiler, Third Space upgraded to a highly efficient electric system, with additional water storage and a demand response system that will reduce energy costs by $1,825 per year.

Total cost

$260,000

- RARA Grant
- BC Hydro DR Pilot
- Clean BC
- Out-of-pocket

**Not including potential tax incentives*

Retrofit Approach & Lessons Learned

1. **Project Planning:** The project was carefully planned over the course of a year to select the right equipment, heat pump location, and installation contractor. Detailed planning is especially important for electrification projects, as the more sophisticated technology often comes with greater complexity.

2. **Contractor-Led Design-Build Delivery Model:** This approach integrates the design and installation and enables early and on-going collaboration between the owners, contractors, suppliers, manufacturers, utility partners, and engineers. This approach can be particularly valuable when timelines are short, unforeseen conditions may arise and creative problem solving may be needed to address constructability, code compliance, and innovative retrofit systems integration.

3. **Heat Pump Placement:** The heat pumps were installed in a small underused parking stall within the building's gated garage. Located just outside the mechanical room, this location allowed for a simple connection to the water tanks and freed up space for the additional tanks required for the demand response pilot. A Development Permit (DP) was not required for use of the parking space.

4. **Tenant Experience:** Replacing hot water systems in an occupied building can be challenging. To minimize disruptions, a temporary boiler was installed alongside the heat pumps. This allowed the mechanical room to be cleared and new storage tanks installed without extended water shutoffs. Switching to the new system required only a brief shutdown, minimizing tenant inconvenience.

Demand Response Benefits

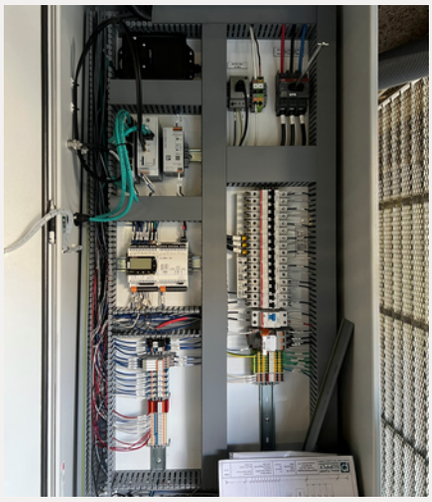
Demand response is the adjustment of a building's electricity use in response to signals like utility pricing, demand charges, or grid needs.

At the building level, benefits include:

- Lower energy bills by shifting electricity use to off-peak times.
- Reduce or avoid costly electrical capacity upgrades.

When implemented at scale, demand response can:

- Ease electrical grid strain, helping utilities defer infrastructure upgrades.
- Minimize the need for costly electrical capacity upgrades.
- Help qualify buildings for future utility demand response incentive programs.



Master Control Panel with Demand Response Integration

Rental Apartment Retrofit Accelerator Program (RARA)

RARA is a free, one-stop concierge retrofit program that helps rental housing providers plan and implement energy efficiency and decarbonization retrofits, offering technical support, education, and central intake for accessing incentives and grants.

The program is led by **LandlordBC**, whose leadership and advocacy in the rental housing sector play a central role in shaping owner-focused, sector-informed retrofit approaches and accelerating market uptake.

RARA is delivered in partnership with **FRESCo**, the prime consultant, which leads participant recruitment, feasibility assessments, and engineering. FRESCo also handles system design, tendering, installation, commissioning, and performance verification.

RARA is funded by the City of Vancouver, City of Victoria, District of Saanich, the Province of BC, BC Hydro, and Natural Resources Canada through the Zero Emissions Innovation Centre (ZEIC) as part of the BC Retrofit Accelerator (BCRA).