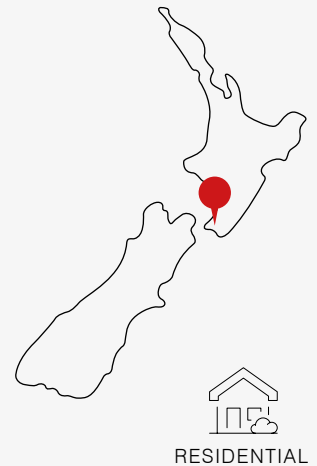


# Project Showcase:

## Development with Next-Gen Hot Water Technology



### WAINUIOMATA



Located in the developing suburb of Wainuiomata, Wellington, two newly built townhouses offer superior comfort and impressive energy efficiency with the adoption of carbon saving Ecodan Hot Water Heat Pump Technology to provide domestic hot water and radiant space heating.

## The Goal

### Sustainability at the Forefront of Building Design

The two semi-detached, two-storey homes, each with 3 bedrooms, 2.5 bathrooms and open plan kitchen, dining and living room were to complete the first stage of the Pakura development. A total of 16 townhouses were planned to occupy the prime location only a few minutes' walk from public transport, the local shops, the swimming pool and community amenities.

Wanting to promote the first phase of the development as the next generation of sustainable and comfortable homes, the property developer sought to add value through higher quality and innovative home offerings to help attract potential buyers.

### Adding Value through Hot Water and Space Heating

Having seen a digital advert for Ecodan Hot Water Heat Pumps, the developer approached Mitsubishi Electric to learn the benefits of Hot Water Heat Pumps for combined domestic hot water and underfloor or radiator space heating.

From there the plans and design stages took place to integrate the most efficient and cost effective solution.

### EQUIPMENT BREAKDOWN

- Ecodan QUHZ CO<sub>2</sub> Hot Water Heat Pump
- Packaged Thermal Store
- Built-In Controller



## Project Showcase: Next-Generation CO<sub>2</sub> Hot Water Heat Pump Technology

### The Challenge

The chosen system needed to efficiently heat the entire home, while also offering individual control for the bedrooms and a simple control system for the main living space. Additionally, it needed to ensure a reliable supply of domestic hot water for the 2.5 bathrooms and kitchen.

Important to the developer was that any visual elements needed to be unobtrusive and seamlessly integrate with the modern interior. Therefore in order to assist with maintaining interior aesthetics, the installation needed enough space to run pipes across the open plan living space and up into the upper level bedrooms without any exposure.

Fortunately, as the developer considered a hot water heat pump solution in the early stages of the design and build, the location of the system could be easily integrated and design requirements allowed for.



### The Ecodan Solution – QUHZ CO<sub>2</sub> Hot Water Heat Pump System

Due to the well-insulated construction of each new home exceeding minimum code requirements, the resulting heat load was just under 5kW. The ideal solution was found by combining domestic hot water and radiator heating through an Ecodan QUHZ CO<sub>2</sub> Hot Water Heat Pump System.

The QUHZ Hot Water Heat Pump utilises CO<sub>2</sub> as it is a safe and natural refrigerant with zero Ozone Depletion Potential (ODP) and a Global Warming Potential (GWP) of 1 – making it the most environmentally-friendly option from the Mitsubishi Electric Ecodan range.

# Project Showcase: Next-Generation CO<sub>2</sub> Hot Water Heat Pump Technology

## Advanced Indoor Thermal Store Allows for Quick Potable Hot Water Recovery

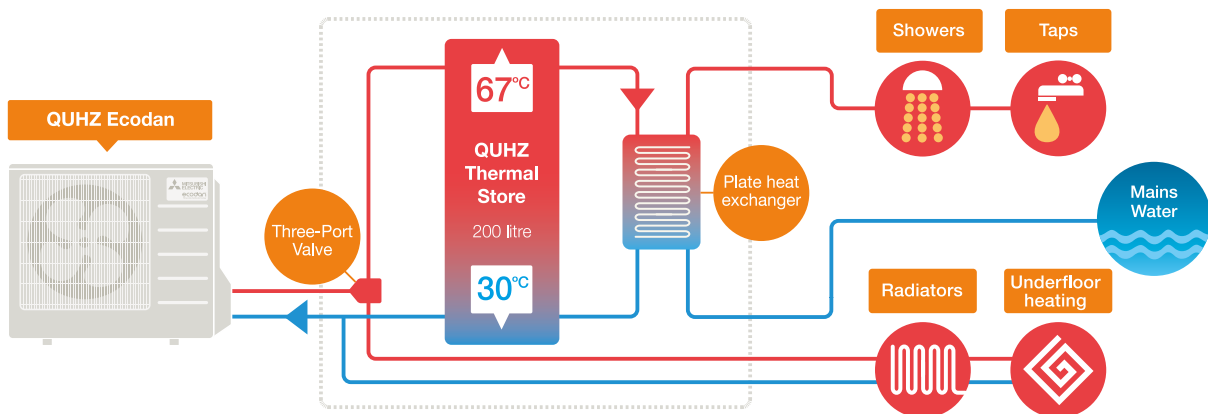
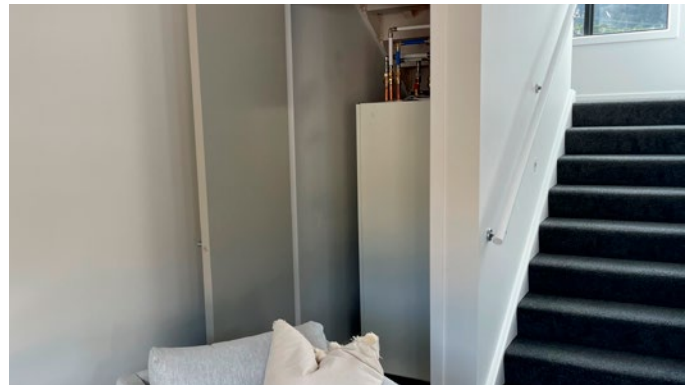
For a 3 bedroom house the QUHZ can easily produce the necessary hot water demand for the home via a dedicated pre-plumbed 200 litre thermal store.

For the development, the thermal store was conveniently placed under the stairs in a purpose built cupboard which ensures easy access for maintenance.

The thermal store swiftly reaches the desired temperature whenever needed, ensuring a constant supply of hot water at your fingertips.

As the mains cold water flows through a plate heat exchanger, it is instantly heated, and the resulting hot water is immediately delivered to the outlets, ready for use. The insulated pipes were installed through the ceiling void, connecting each radiator positioned throughout the house.

Another advantage is the elimination of legionella concerns typically associated with conventional hot water tanks, as the potable hot water is not stored within the system.



## Energy Monitoring

The homeowners benefit from built-in energy monitoring, offering the ability to check to see how much electricity they have consumed and how much heat energy is delivered to the home and hot water. At the same time as managing the heat load with minimal energy use, this system will intuitively manage the hot water by checking the tank for a 15°C drop in the temperature.



## Project Showcase: Next-Generation CO<sub>2</sub> Hot Water Heat Pump Technology

### Radiator Space Heating Offers Ambient Warmth with Individual Room Control

The Ecodan QUHZ System was paired with 5 modern and stylish radiators, supplied by Ke Kelit, in the open living area and each of the three bedrooms. Selected in a neutral white to blend seamlessly into the walls and in a variety of sizes that suited the needs of the room and available wall space – the radiators offer quick and even heat distribution.

Each radiator has a thermostatic control, granting the homeowners the ability to adjust heating in individual rooms while maintaining a comfortable overall temperature. This level of control enhances efficiency by only heating the areas that need it, reducing wasteful heating in unoccupied rooms. Furthermore, ambient heating is silent, which will be most appreciated during night time.

### Quiet Outdoor Unit Perfect for the Medium Density Project

The 4kW outdoor unit was ideal for the townhouse development due to its compact footprint and class leading, low noise operation at 43dBA. This ensures it can be installed in close proximity to neighbours without noisy disruption - meeting all requirements for reasonable noise as laid out in both the district plan and section 16 of the Resource Management Act 1991.

### The Result

With super energy efficient potable hot water up to 70°C and radiator heating with a variable flow temperature based on a target room set point, the homeowners love their greener heating system to meet all of their domestic water heating and space heating needs.

The wall mounted controller doubles as thermostat for space heating, including heating timers and energy monitoring, while also controlling potable hot water. Over the last year the system had consumed 1900kW and Delivered 7000kW, resulting in estimated savings of at least \$1,000\* compared to traditional heat sources. Moreover, this translates to a significant carbon saving of 1,500 KgCO<sub>2</sub>e\*\* per year.

The QUHZ CO<sub>2</sub> Hot Water Heat Pump provides a very cost effective solution for new builds and retrofits when utilised as a combined heating and hot water source, at the same time it is one of the simplest ways to reduce carbon footprint and energy consumption.



# Project Showcase: Next-Generation CO<sub>2</sub> Hot Water Heat Pump Technology

## Full Equipment Breakdown

### Hot Water Heat Pump System

1x 4kW QUHZ CO<sub>2</sub> Hot Water Heat Pump  
1x EHPT20Q-VM2EA 200L Packaged Water Cylinder  
1x Flow Temperature Controller

Installer:



Heating design and radiators supplied by:



\*Based on data supplied by MBIE of electrical charges for 2021 of 29.36 c/unit and at Ecodan COP of 3.68 (source: homeowner supplied data).

\*\*Assuming natural gas CO<sub>2</sub> equivalent emissions = 0.2167kg per kWh and Electrical CO<sub>2</sub> Equivalent emissions = 0.1287kg/kWh (source: "Summary of emissions factors for the Guidance for Voluntary Greenhouse Gas Reporting - 2016" Ministry for the Environment).