Project Showcase:

Ngaio Renovation Project

WELLINGTON

RESIDENTIAL

On the hills of Mount Kaukau near Wellington City is the suburb of Ngaio where this family residence underwent a considerable makeover with the goal of significantly reducing their energy use in the newly renovated home.

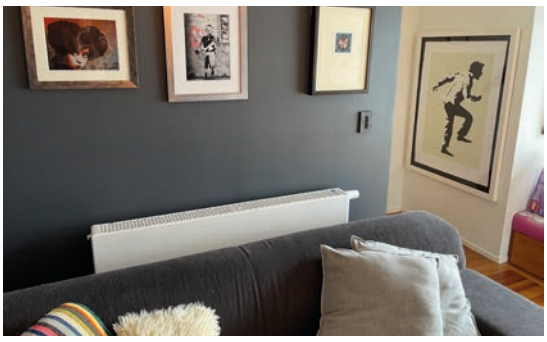
EQUIPMENT BREAKDOWN

- Ecodan Hot Water Heat Pump
- Domestic Hot Water
- Radiator Space Heating

The Goal

The owner's vision was to create a modern family dwelling that was warm, dry and healthy. The first stage included upgrading the insulation levels in the ceiling, walls, and floors as well as tackling all the windows with double glazing.

The second stage addressed the big energy users in the home; the heating of the rooms and hot water. Whilst living overseas, the owners had experienced the comfort and ease of a central heating system. As a result, they were especially keen on integrating radiator heating in their revamped Ngaio home. Furthermore, they were seeking an integrated solution that combined both hot water heating and space heating at the same time.



Project Showcase: Ngaio Renovation Project

The Challenge

The owners bought the house with the intention to renovate. It was originally built in three phases in the ‘50s, ‘60s and ‘70s to the code and specifications of the era. This meant that the house had no insulation, no heating aside from one log burner and the thinnest single glazing on the windows. To add to this, the hot water cylinder was a low-pressure header tank fed system with a small capacity which ran out after two showers.

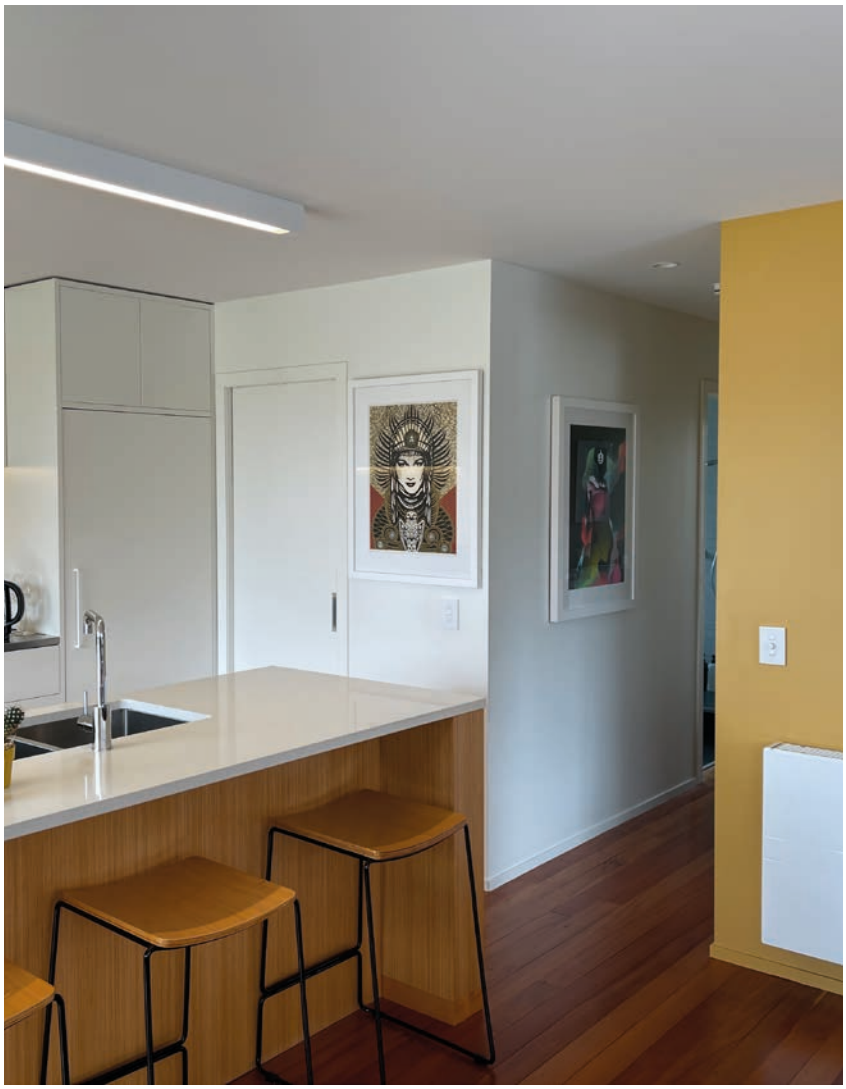
The Solution

The clients specifically wanted an integrated engineered solution to satisfy the home heating and hot water requirements.

Therefore, this solution needed to have enough capacity to ensure all the rooms were adequately heated and sufficient hot water was available at all times to meet the growing family’s needs, even in the depths of a Wellington winter.

The homeowners were especially keen on a central heating radiator system to cover their space heating requirements.

The Ecodan Hot Water Heat Pump System chosen achieved the overall goal of having an effective and efficient whole home solution that delivers both radiator heating and hot water from the single heat pump system.



Project Showcase: Ngaio Renovation Project

Super Efficient Ecodan Hot Water Heat Pump for Space and Water Heating

An 11.2kW capacity Mitsubishi Electric Ecodan Hot Water Heat Pump System was the perfect solution to cover the daily hot water needs as well as the home's space heating requirements at the same time

A packaged system was chosen that conveniently comes pre-plumbed and pre-wired. This solution incorporates a 200 litre water cylinder and the heat exchanger all in the one package. The system features fast heat-up times through the use of Plate Heat Exchanger Technology that works in conjunction with smart energy monitoring and control.

Built-in Smart Control with Energy Monitoring

With a state-of-the-art integrated Fifth Generation (FTC5) Controller, energy monitoring and management of the Ecodan Hot Water Heat Pump System is easy. The control has given the homeowners the visibility and freedom to efficiently manage their overall water heating power consumption. Furthermore, the controller now enables the family to take advantage of off-peak tariffs, to save even more on their electricity bill.

Stylish Radiators Used for Space Heating

Eleven radiators have been installed throughout the home to provide contemporary space heating to the various rooms.

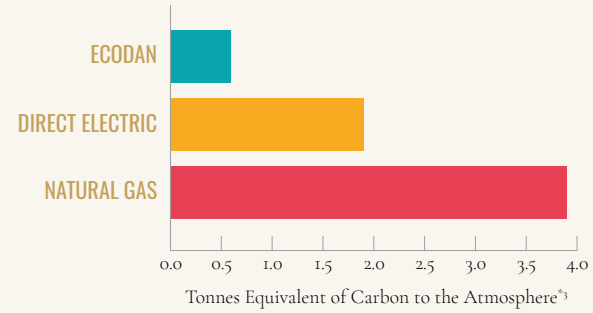
Radiators are the ideal solution for responsive heating that can be mixed and matched to each room. Quick to heat up as well as turn down or off, radiator heating is easy to control room by room.

Low Carbon, Energy Efficient Performance

The Ecodan Hot Water Heat Pump has provided this home with an impressive COP of 3.3![*1] Furthermore, the overall carbon footprint is significantly smaller when comparing to typical gas and direct electric systems. In the last year, this Ngaio Ecodan unit has only contributed an approximate 0.60 tonnes equivalent of carbon to the atmosphere[*3].

When the Ecodan is compared to an equivalent capacity natural gas heating and hot water system, the equivalent carbon emissions are approximately 3.9 tonnes[*3]. That is an equivalent of 3.3 tonnes[*3] of carbon savings with an Ecodan Hot Water Heat Pump System – which could fly an aircraft from Wellington to Auckland at least 26 times![*4]

Comparison of carbon emissions of equivalent capacity hot water systems for domestic hot water and space heating.



*1 Based on the unit's 2020 electrical consumption (4414 kWh) and heat delivery through heating and hot water (14652 kWh).

*2 Based on manufacturer information for gas instant hot water heater (non-condensing).

*3 Assuming natural gas CO_2 equivalent emissions = 0.2167kg per kWh and Electrical CO_2 Equivalent emissions = 0.1287kg/kWh (source: "Summary of emissions factors for the Guidance for Voluntary Greenhouse Gas Reporting - 2016" Ministry for the Environment).

*4 Calculations via AirNZ fly neutral calculator www.airnewzealand.co.nz/loyaltymodule/form/carbon-emissions-offset as of 18/10/2021.

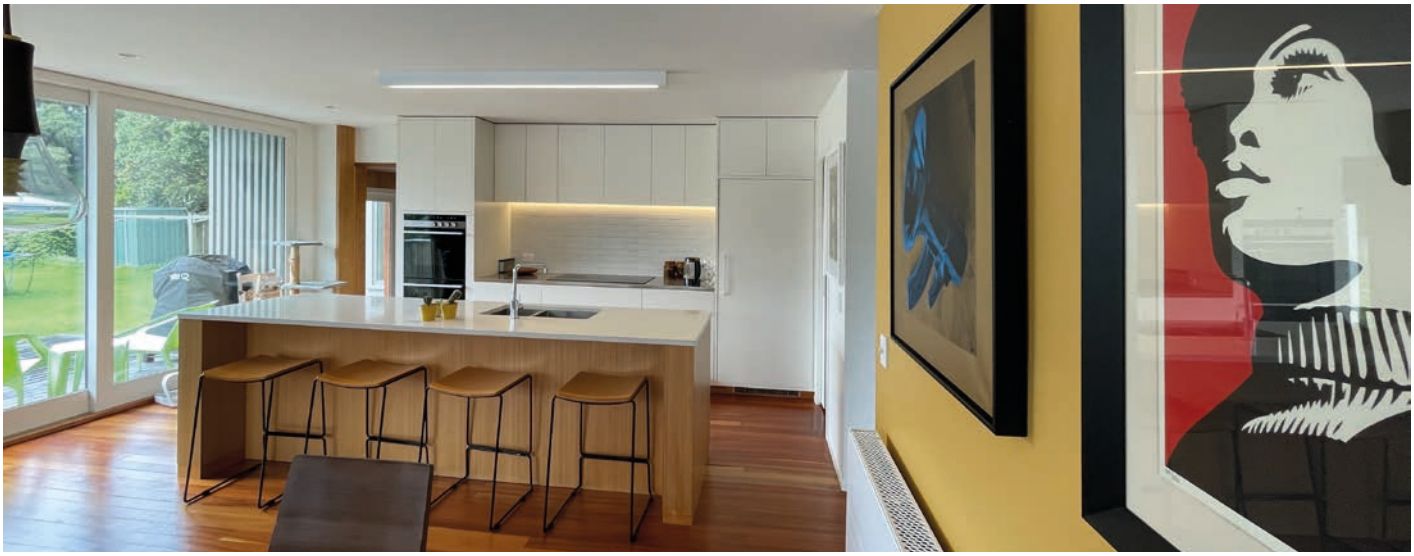
Project Showcase: Ngaio Renovation Project

The Result

Having a well-insulated house with the biggest energy users in the home addressed by a high-efficiency Ecodan Hot Water Heat Pump system by Mitsubishi Electric, this family is happier and healthier than ever.

Rob the homeowner explains: “I was rather surprised that radiators have moved on in their technology and we installed units with fan systems for even quicker heating. We would never go back. The Ecodan System has been the making of the house. We just don’t think about being cold anymore. We find that we are able to fully heat the house and then keep that heat rather than losing it. The system is simple to use and most impressively we have seen our power bills more than halve from our previous heating system and electric element hot water cylinder in the same home during winter. The only downside is that now we get caught out forgetting to take a coat as we don’t know how cold it is outside until we go out.”

Furthermore, the designer – Flynn from Herriot Melhuish O’Neill Architects (HMOA) in Wellington commented: “We had excellent advice, from the initial technical presentation the HMOA team was impressed with the significant efficiency benefits of the Ecodan System. The associated consultants and installers made the implementation stress-free and worked around the quirks of the existing building. It was also great to see continued after-sales contact and survey of the system, ensuring it did deliver on expectations – which by all accounts it has.”



Full Equipment Breakdown

Outdoor Unit

1x 11.2kW PUHZ-W112VHA Ecodan Packaged Water Cylinder and Heat Exchanger

Indoor Unit

1x EHPT20Q-VM2EA 200L Ecodan Packaged Thermal Store

Controller

1x FTC5 Wall Controller

Installer:
Leon Smith Plumbing

Architect:
HERRIOT MELHUISH O’NEILL ARCHITECTS