# Project Showcase:

## Hot Water and Space Heating Solution for Cold Conditions

NELSON

RESIDENTIAL

**Located 90 kilometres southwest of Nelson, Saint Arnaud is an idyllic small alpine village where a couple was after an energy efficient whole home hot water and underfloor heating solution for their abode.**

### EQUIPMENT BREAKDOWN

- Ecodan Hot Water Heat Pump
- Domestic Hot Water
- Underfloor Heating

## The Goal

Wanting a slowdown and change in lifestyle, they decided to build their house to cater to their retirement on the horizon. A lot of thinking went into the design concept and once the layout was confirmed, they wanted to be certain of a warm, dry and comfortable home that is efficient to run year-round.

## The Challenge

Being located in an alpine area which is prone to colder weather, the house had to be planned with a focus on staying warm throughout the day and night regardless of the weather outside. With the all-important thermal envelope and airtightness of the build decided, the discussion moved to heat sources. The couple decided not to opt for a traditional fireplace that every other property in the village has. They felt a fireplace would introduce unwelcome additional air changes into the airtight

home because of the flue through the ceiling. This would contribute to heat loss which would have the opposite effect on the overall goal.

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## The Solution

To match the owners' expectations for an efficient system that can operate regardless of the outside temperature, an Ecodan Hot Water Heat Pump was the ideal solution.

### Super-Efficient Ecodan Hot Water Heat Pump

With the clear goal of energy efficiency, a fully integrated engineered solution to heating and hot water was required. An Ecodan EHST20C-VM2C Packaged Cylinder was chosen due to its small footprint by combining domestic hot water and underfloor heating via one system. It includes a 200L domestic hot water cylinder, hydraulic components pre-plumbed and wired with an integrated user-friendly controller.

### Built-In Smart Control with Energy Monitoring

The intelligent FTC5 Controller also actively manages the heat required via the combined user interface and thermostat. At the same time as managing the heat load with minimum energy use, this system will also actively manage the hot water by checking the tank every half hour for a 10°C drop in temperature. The tank is then quickly topped up back to 60°C when required to ensure hot water is always on tap.

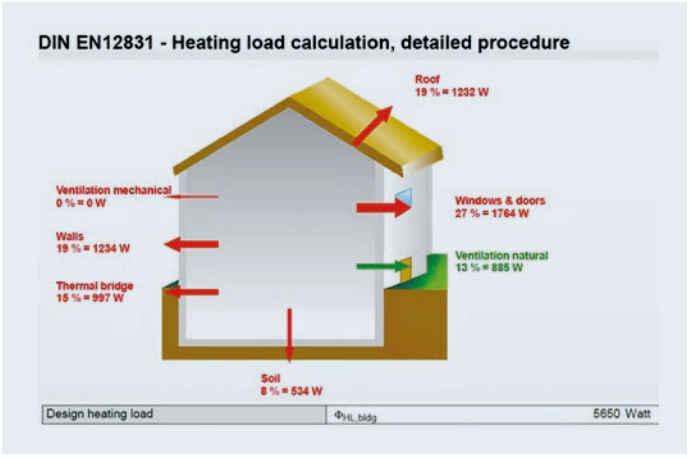
### Reliable Performance in Outdoor Temperatures as Low as -15°C

With the winter temperatures sure to drop below zero in the village, assurance was needed that the system would perform in the colder conditions. With this in mind, Ecodan incorporating the Mitsubishi Electric patented Zubadan Flash Injection Technology was chosen. This means that full capacity of the system is guaranteed even when the temperatures reach as low as -15°C.

### Facts:

Size of the house: 160m$^2$

Calculated heat load: 5.65kW

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## The Result

Ecodan has played its part beautifully with the underfloor heating manifold being supplied with all the heat it needs. Even with winter weather seeing -6°C in the village, the client was pleased to report that the house was lovely and warm with very low energy use. In fact, their unit for the year 2021 has saved the owners an estimated $1,500 in running costs compared to an electrical resistive heating system.*1

Furthermore, comparing to natural gas hot water and heating their carbon footprint is reduced by approximately by 1.87 tonnes.*2

They were also happy with the added bonus of not needing to chop firewood!

*1 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).

*2 Based on data supplied by MBIE for 2021 of electrical charges of 29.36 c/unit and at Ecodan COP of 2.6 (source: homeowner supplied data).

## Full Equipment Breakdown

1x PUHZ-SHW80VHA 8kW Hot Water Heat Pump

1x EHST20C-VM2C 200L Packaged Water Cylinder

1x FTC5 Built-In Controller

## Contractor:

BRIGHT SPARKS ELECTRICAL SOLUTIONS