

Hot water case study: Commercial heat pump hot water system

Crows Nest Community Centre, Crows Nest, NSW



We were looking for a cost-effective and reliable system to replace our ageing gas hot water system. We heard that heat pumps might be the answer, and this has proved to be the case.

Denise Ward, Executive Officer CNCC

Project summary

This case study highlights the value of replacing old hot water systems with new and energy efficient hot water technologies.

Electric heat pump systems run on electricity and are typically three to four times more efficient than electric water heaters. This means that for the same energy input, at least three times more heat output can be achieved.

About the business

Crows Nest Community Centre (CNCC) heated water for the building using three gas boilers. As the gas boilers were aging and becoming unreliable, an electric boiler was installed to replace a gas boiler to ensure hot water continuity. After a second boiler showed signs of leaking, it was decided to replace the system and upgrade to a renewable energy solution if it was cost effective. The management team at CNCC went to market and after evaluating the received proposals selected four 7.2 kilowatt heat pumps with two 420- litre storage tanks.

The installed heat pumps run on solar electricity generated by panels on CNCC's roof.



The picture shows heat pumps extracting heat from the air to warm water.

Fast facts

Annual hot water consumption

- ≈357,000L

Savings

- 78% of imported energy savings
- Estimated annual energy savings of 31,514 kilowatt hours (kWh)
- Annual savings in dollars \$6,302
- Heat pump system is expected to significantly reduce maintenance cost over the system life

Financial rebate

- 66 Small-scale Technology Certificates (STCs) at \$38 per STC

Environmental benefit

- Renewable source of energy to heat water. Heat pump extracts heat out of the surrounding air and transfers it into your storage tank to heat water.
- The system saves 90 tonnes of carbon dioxide (CO₂) over the 15 year lifetime

Why a heat pump was chosen

The management team at CNCC's wanted to reduce their energy usage, but also increase the contribution of renewable energy.

The heat pump system chosen works with the existing 30.5 kW solar PV installation on the CNCC's roof, which is shown in the aerial image below.



Initially, the management team considered solar hot water systems but did not want to give up valuable roof space.



Two heat pump storage tanks next to the back up electric hot water tank.

One advantage of heat pumps is that they do not use up roof space, while harvesting similar amounts of renewable energy from the air. The management team also considered the fact that heat pumps work in the shade and at night time important.

Other interesting facts

The picture below shows the two storage tanks the heat pump feeds into. The electric hot water system to the right of the storage tanks was originally installed to replace the first gas boiler. Because it was still in good condition, it was retained as a backup should there be any issues with the heat pump.

The electric hot water system has never been switched on since the heat pump started operating and remains in the 'off' position.