

Achieving good solar water heater performance

Beacon Pathway has used solar water heaters in five live research homes. Two were new homes, the Waitakere NOW Home and the Rotorua NOW Home. Three were renovations to homes in the Papakowhai Renovation project.

As each of these homes was part of a research project, monitoring has shown how well the solar water heating systems worked.

Wrong angle, limited performance

The Waitakere NOW Home panels were only installed at an angle of 20° in line with the roof. They should have sat at 37° to match the Auckland latitude.

A display unit in the Waitakere NOW Home showed the homeowners exactly what temperature their solar system was providing. An on-off button allowed the homeowners to turn off supplementary heating, which they seldom did, but there was no automatic timer control. This meant that the supplementary heating came on after morning showers and hot water use, even though the water would be heated by the sun over the day.



This system provided only 45% of water heating.

Wrong angle, outdoor cylinder

The Rotorua NOW Home® panel was limited to an angle of 30° by the framing that it came with. It should have been at Rotorua's latitude of 38°. The outdoor cylinder also had the most heat loss.

There was no display or timer control, which would have allowed the occupants to maximise solar heating during the day.

This system provided only 36% of water heating.



Good size, good angle, good result

The Papakowhai panels sat at 41° to match the latitude of the site. Two twelve-tube panels were connected, forming a large collection area, and 300 litre hot water cylinders were installed with lagged pipes.

A controller limited the amount of supplementary heating provided while the circulation pump is operating (and therefore when solar energy is available) but, again, there was no timer preventing unnecessary supplementary heating.



These systems provided between 70-75% of hot water for these families.

For more information:

- You can read the full report on Beacon's solar water heating systems on www.beaconpathway.co.nz/further-research/article/reports_and_presentations_energy
- Energywise website www.energywise.govt.nz which has pages on solar water heating and information on government subsidies for solar hot water systems.
- You can also find out more from the website of the Solar Association of New Zealand www.solarassociation.org.nz