by Jim Robinson, Energy Options Ltd, Whakatane

Installing a solar water heating system.

Overcoming the barriers to solar uptake

A pilot study recently completed in the Eastern Bay of Plenty examined the barriers to uptake of solar water heating – and found there's much more to it than money.

What's stopping more New Zealand homeowners from having solar water heating installed? In 2003–04, the Eastern Bay Energy Trust commissioned Energy Options from Whakatane to undertake a 25-home study to identify the barriers to uptake.

The pilot project included 14 rural and 11 urban homes in the district council areas of Whakatane, Opotiki and Kawerau. Five different systems were used. Homeowners selected from information provided by suppliers and from their own research.

Of the 25 installations undertaken, 24 were retrofits to existing homes. The majority of systems installed were pumped split systems comprising a solar collector on the roof plumbed to an existing or new vertical hot water cylinder. The issues that clients identified at the decision-making stage (excluding price) were:

- low-pressure versus high-pressure systems
- tubes versus flat panels
- thermosyphon versus pumped systems
- split versus integral systems
- direct or heat-exchange systems
- existing hot water cylinder or a new one
- reliability, strength, durability (especially in coastal environment)
- construction materials and coatings
- frost risk
- performance
- compatibility with woodburner/ wetback.

The cost barrier was substantially reduced by the Trust providing a $2,000 subsidy for each home. This enabled Energy Options to examine how interrelationships between designers, suppliers, installers and customers affect the uptake of solar water heating.

Lessons for both solar and building industries

The report concluded that the design and manufacture of high-quality solar water heating components had largely been achieved. Contrary to the claims of competing suppliers, both flat panel and evacuated tube systems can be expected to perform well. The choice of collector is generally not what makes a system a 'success' for the customer. Far more important is the clarity and honesty of information (enabling the right choices and expectations), seamless coordination between supplier and installer, and effective installation and support.

'At the end of the process, homeowners want the expected performance and savings,' says Charles Wilkie of Energy Options. 'The industry needs to do better on this. There's a lot of overselling of systems, with claims that this or that product is the best. Some of the hype makes promises that systems could never deliver in the real world.'

Looking forward, Wilkie says manufacturers need to put more effort into their printed information, to deliver clear facts – not just technical detail or lifestyle imagery. And they need to ensure installers have the knowledge to back the information up when talking with prospective customers.

More training and support for installers

This is the biggest area for improvement in the uptake of solar. The installer must have the knowledge to advise on the right choices, and then configure the system for reliable, optimum performance. For instance, it's important to optimise the pitch and orientation of the collector. Attention to detail makes a real difference. The installer may be a subcontractor or an independent plumber, but the issues are the same.

Installers are working from manufacturer's instructions (ranging from one-page sheets to bound documents) but generally they get little or no face-to-face training, and there's seldom quality control or backup support.

In the pilot, only two of the suppliers came on site to train and oversee initial installation. Problems arose when recommended procedures conflicted with standards, codes and best practice guidelines. There were further problems when incorrect advice was given and parts such as the pump, controller or check valves had to be replaced.

Wilkie believes the industry as a whole also has a responsibility to provide training. A positive step forward is a course for installers at WINTEC (Waikato Institute of Technology) developed in conjunction with the Solar Industries Association.

Integration into an energy-efficient home

Solar water heating shouldn't be seen as just an optional extra. For any new home, energy efficiency should be designed into the house from the start – not added at the end. Retrofitting raises unnecessary and often insurmountable barriers.

'Home designers should be discussing the best options with manufacturers and installers. Thought should be given to ensuring sufficient north-facing roof space for a solar collector and the most energy-efficient location for the hot water cylinder. More attention should be paid to the humble hot water cylinder itself,' Wilkie says. To get the best performance with solar, the cylinder should be of sufficient storage capacity, so generally needs to be 'one size up'. That means the cupboard needs to be a little deeper. Typically new homes are designed with a space that's way too small. It's a matter of thinking ahead and working together – all the way from the design stage through to installation. ›‹

Energy Options

Energy Options in Whakatane employs 20 staff. Its core business is thermal and acoustic insulation, with solar water heating an increasingly important part of the business. Find out more by contacting Charles Wilkie, tel: (07) 308 9126 or email: charles.wilkie@energyoptions.org.nz.