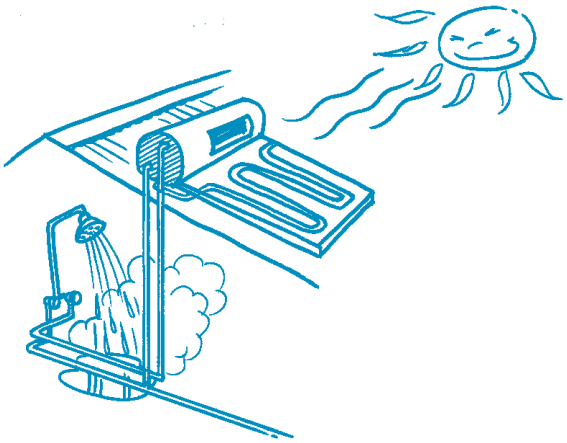
Hot Water



Hot water plays an important role in helping to prevent sickness in communities. Washing with warm, soapy water is an effective way of removing germs from the skin. This helps prevent the spread of some diseases. It is also important for people to be able to wash clothes and blankets. All items used in the preparation and eating of food should be thoroughly washed with hot water to help prevent sickness. A reliable source of hot water is necessary for people to be able to do these important jobs.

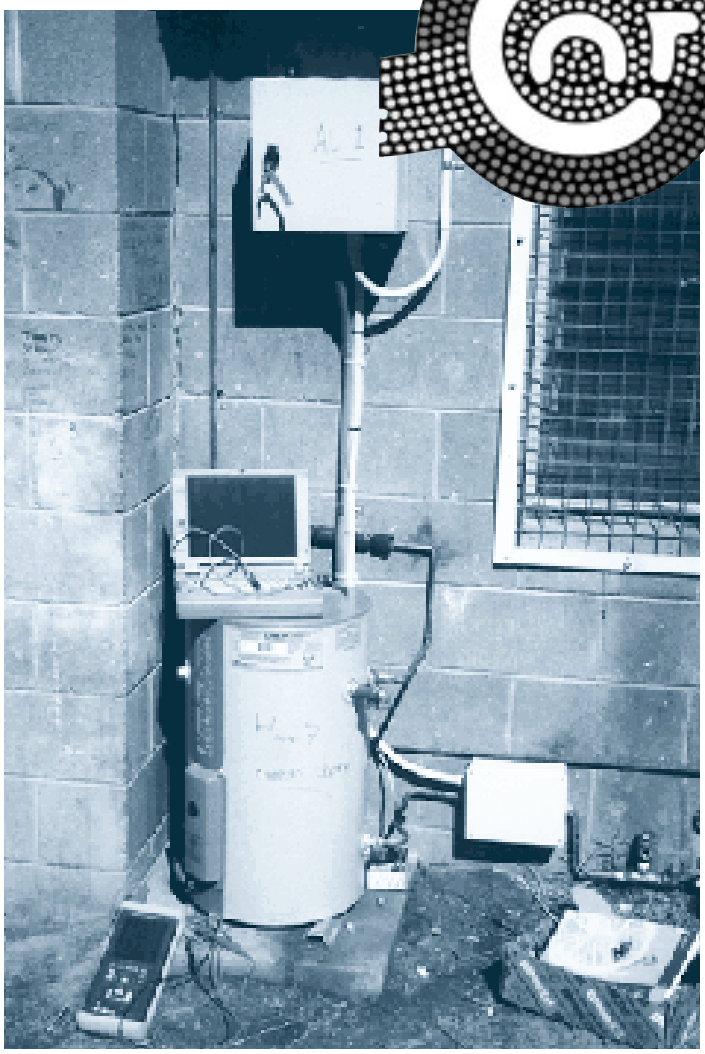
Unfortunately for a variety of reasons many people in remote Indigenous communities lack access to an adequate and reliable supply of hot water. CAT has completed a project looking at hot water use and the performance of different types of hot water systems in remote communities. The project aimed to improve the delivery of hot water to people living in remote communities and was funded by ATSIC and supported by the Nganampa Health Council.

Several communities participated in the project including Kintore (NT), Kalka and Wataru (APLands, SA), Napranum (FNQ) and Alice Springs Town Camps (NT). Thanks to these communities for their participation.

Different types of hot water systems were trialled during the study including:

- electric;
- heat pump;
- gas;
- solar (with electric boost);
- solar (no boost) and
- chipheaters.

Manufacturers of hot water systems were approached and most provided hot water systems for use in the trial at a discounted price. Systems were installed at community members'houses. Computerised measuring equipment was fitted to measure quantities such as the water temperature, power consumption and amount of hot water used. CAT staff visited and checked each installation every three months during the trial.



What we learned

Hot Water Use

The study found that on average the amount of hot water used by each person living in a remote Indigenous community is roughly the same as that used by other people in Australia.

The main difference between remote Indigenous households and households in other parts of Australia was that the population of remote Indigenous households often changed significantly during the year due to visiting friends and relatives. As the number of people in the house changed so did the amount of hot water consumed. This variability in demand makes it harder to choose a hot water system that will suit the needs of a household throughout the year.

Running Cost of Systems

The study compared the running cost of different types of systems. A measure of the running cost of a system is the cost of the energy used to provide a given amount of hot water (say 100 Litres) at 60°C. The running cost does not include costs associated with maintaining or repairing systems. Figure 1 summarises the estimated running costs for different hot water technologies.

Running cost relates to the efficiency of a system and the unit price of the energy source (i.e. electricity, gas, wood, energy from the sun). In some communities the cost of electricity is subsidised. This means the price community members pay for electricity is less than the actual cost of providing the electricity. For hot water systems that use electricity the graph shows estimated running cost at both a subsidised price (16c/kWh) and an estimate of the actual price ($1.00 /kWh).

Of those systems using electricity (i.e. electric, heat pump and boosted solar), the heat pump systems were found to have amongst the lowest running cost. Electric boosted solar hot water units had highly variable levels of performance. Some of these units had a lower running cost than a typical heat pump system, while others performed poorly with a running cost similar to that of an electric unit. Electric-only systems had the highest running cost.

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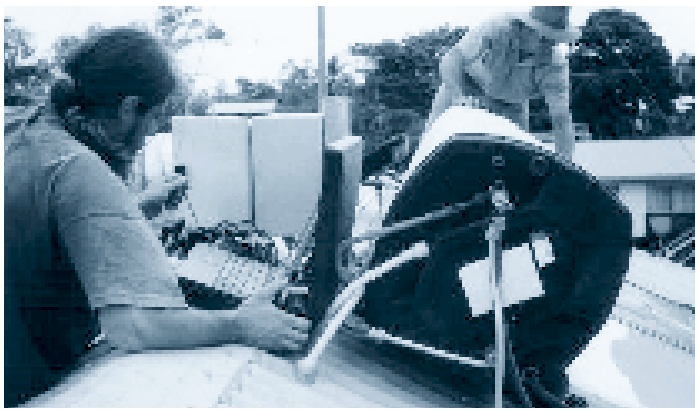


Hot water systems using electricity often use a big proportion of a household's total power. Generally speaking, hot water systems using electricity are not suitable for use with stand-alone renewable energy systems. Hot water technologies that do not use electricity (i.e. solar with no boost, gas or wood) are attractive as they can significantly reduce a community's electricity demand, creating an opportunity to use sources of renewable energy.

In theory the solar hot water units with no boosting have no running cost. However, during the trials the houses with these systems complained of not having enough hot water when there were lots of people staying in the house.

In terms of running cost, the attractiveness of using gas instead of electricity really depends on the price people are paying for their electricity. The study found that, for a number of reasons, many people were not keen to use gas hot water systems.

The chipheater systems show some attraction as a low cost energy source. Apart from an unboosted solar unit, chipheater systems are probably the cheapest option, particularly where people are paying close to the "real" price for electricity. Some people found the gathering of wood to be an inconvenience. The running cost shown in the graph is based on purchasing wood from a supplier. People also need to think about the long-term sustainablity of using local wood resources as an energy source.

Reliability

Information was also gathered on whether people had experienced problems with the operation of their systems and/or were happy with its performance. The condition of units after the twelve month trial was also considered.

Other factors

There were a range of factors associated with different stages of a hot water systems lifetime that were identified as having a potential impact on the reliability and durability of systems. These included:

Quality of manufacture and packaging – poor manufacture of certain systems led to early degradation of these systems. Poor quality control in packaging led to significant problems when systems were being installed in remote areas.

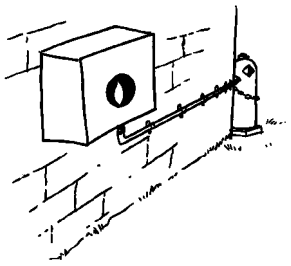
Transportation and installation – poor quality installation was found to be a major factor leading to premature failure of systems.

Operating environment – the highly mineralised waters found in many remote communities led to scaling and corrosion of elements and tanks which resulted in system failure and a shortenened lifetime. The use of stoneguards was found to be an effective way of protecting solar hot water systems.

Repairs and maintenance – the absence of preventative maintenance programs was identified as a major factor contributing to the poor performance and short lifecycle of systems.

The report concludes with a series of recommendations aimed at improving the delivery of hot water to people living in remote communities. Further information on the study and copies of the report can be obtained by contacting CAT.

Compiled by Laurence Wilson, CAT



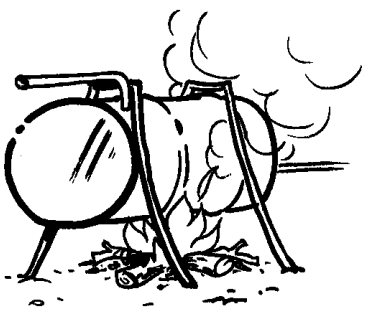


FIGURE 1