Getting into hot water: Solar water heating pays for itself five times over

March 9 2009

An analysis of the engineering and economics for a solar water-heating system shows it to have a payback period of just two years, according to researchers in India. They report, in the *International Journal of Global Energy Issues*, on the success of the 1000-liter system operating at a university hostel.

The current focus in the developed world is on advanced technological approaches to alternative energy sources, such as photovoltaic cells for solar power and harnessing wind and wave with elaborate systems to generate electricity. However, the cost of such systems may be prohibitive for some applications in the developing world. They also often ignore the fact that a mundane process such as heating water might best be carried out using direct heat from the sun rather than including a waste energy-conversion step.

Vivek Khambalkar, Sharashchandra Gadge, and Dhiraj S. Karale at the Dr Panjabrao Deshmukh Agricultural University, in Maharashtra, India, explain how they have evaluated the various costs and benefits involved in solar hot-water production. They have compared solar hot-water production per liter with electrical energy approaches and found that solar heating is 57 percent of the internal rate of return.

"Solar energy is the only renewable energy source that has wide range of uses with commercial viability. Solar energy provide water heating, air heating and electricity through various modes of applications. The use of solar energy for thermal purposes is the most cost-effective way of

utilizing the resource. A solar water heating system satisfies the need of warm water," the researchers explain.

Importantly, the payback time for the initial investment in equipment and installation is just two years. This compares very well to a photovoltaic system used for electricity generation if it were only being used to heat water. Photovoltaics have a payback period of several at least a decade and sometimes double that.

The solar hot water system used in the study is installed at the Jijau hostel, part of the Dr Panjabrao Deshmukh Agricultural University campus, in Akola, Maharashtra state, India. The team estimates that the system will effectively pay for itself five times over, given an estimated working life of about twenty years.

More information: "Solar water cost and feasibility of solar water heating system" in *Int. J. Global Energy Issues*, 2009, 31, 208-218

Source: Inderscience Publishers