

## SOLAR WATER HEATERS BUILT ON WASTE PLASTIC BOTTLES AND CARTONS

In 2002, the Brazilian mechanic Jose Alano built a solar water heater using 100 plastic bottles and 100 milk cartons. The invention became popular after having won the *Superecologia* prize, provided by an important magazine, for renewable projects submitted by the non-profit sector. Following this award, the recycled solar heater has been promoted by the media and supported by electricity companies, local governments and by the Brazilian Special Secretariat for the Environment SEMA.

More than 7,000 people are already benefitting from the solar heaters in Santa Catarina State where two cooperatives (in Tubarão and Florianópolis) are producing solar heaters to be installed in houses. During 2008, in Paraná State, 6,000 solar heaters had been installed thanks to workshops organized by SEMA. The Paraná State, in 2013, hosts the largest solar water heater in Brazil, built with 1.8 thousand PET bottles and 1.5 thousand tetra-packs. Solar heaters are becoming an important alternative in Brazil and neighboring countries are looking at this innovation with interest.

The plastic bottle solar water heater is based on the thermosyphon technology which is used in many solar water heaters. It makes use of the circulation of water based on density; hot water, which is less dense, moves upwards while the cold water, which is denser, moves down. The inventor estimates that a 1m<sup>2</sup> panel is enough to heat water for a shower of one person. The plastic bottles in the panels should be swapped for new ones every 5 years, because the plastic becomes opaque, reducing the heat capture.

The solar water heater contributes to solve a great impact problem, as the high energy cost of electric water heaters. Nevertheless, this innovative solution has another important environmental added value, because it creates a regular collection of waste, recycling plastic bottle and carton in a territorial consumption strategic product.

The author registered the invention only to prevent businesses from promoting the solar water heater for profit motives. However, the invention can be used by other ones, and information is freely available in the public domain. The websites introduced below show guides and manuals for the construction and the installation of the solar water heater.

### To know more

[Solar Heater - Manual on the Construction and Installation by Jose Alano](#)

[Guide in Renewable Power News](#)



