

## India: Solar Water Heating



Solar water heaters provide households, small and medium sized enterprises (SMEs) and institutions, such as schools and hospitals, with an in-house hot water supply powered by renewable energy rather than carbon-intensive grid electricity. Solar water heating units consist of a solar collector which absorbs solar energy, an insulated tank to store the hot water, and pipework to transfer the hot water to its point of use. The project manufactures, distributes, installs and maintains solar water heaters with a primary focus on serving urban areas throughout the country. For India, this technology represents an opportunity to enhance energy supply for its growing population, while promoting low carbon development.

Project type: Renewable energy;  
household devices

Region: Asia



Standards:

**Gold Standard**  
Climate Security & Sustainable Development

**CDM**

**Green growth:** Solar water heating technology enables India to enhance energy supply for its growing population, while promoting low carbon development.





The project distributes, installs and maintains solar water heaters for a variety of buildings, including: residential, commercial, educational and governmental.

### The project

The project uses a range of channels to distribute the solar water heaters, primarily private entrepreneurs or larger entities that act as solar water heater dealers and franchise sub-dealers. Some units are also sold directly to customers, and in some instances, partnerships with city, state and regional governments are also used for distribution. The project developer conducts awareness programmes in schools and general public exhibitions to help increase uptake of its solar products.

## Solar water heating units displace grid electricity, helping to reduce peak load demand and the associated blackouts from a shortage of grid supply

So far the project has largely been focused in Bangalore, Karnataka which makes up approximately 50% of the installations. However, the technology is applicable throughout the country and the first monitoring period included implementation in a range of other states, including Maharashtra, Andhra Pradesh, Delhi, Goa, Gujarat, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh. The project will continue to have a focus on the domestic household segment going forward, specifically smaller apartments and flats that have historically been underserved by the industry. Outside the domestic market, educational, religious and charitable institutions will continue to be targeted. The solar units installed in educational institutions tend to serve dormitories on residential campuses.

### Contribution to sustainable development

The project contributes to sustainable development in several areas:

#### Energy access

Solar water heaters use free solar radiation as a source of renewable energy and therefore help diversify energy sources and increase the share of sustainable resources. In the absence of the project, users relied on electrical water heaters drawing electricity from the power grid which is primarily fossil fuel based. Importantly, solar water heating reduces energy costs for users since solar energy is a free resource. Given that an estimated 20-30% of electricity in India is used to heat water in urban households, commercial and institutional buildings, the cost saving is of notable potential.

#### Financial security

As the project uses a free source of renewable energy, significant fuel savings can be made for users who replace electric units with a solar water heater. By replacing grid-dependent electric units with a 200 litre/day capacity solar water heater, it is estimated that the typical household can save on average about INR 9017 (USD 134) per year.

The project employs approximately 160 local residents for manufacturing, distribution, installation and maintenance roles.





50% of sales are currently around Bangalore but the project is distributing solar water heaters throughout the country.

#### Economic growth

As the project is being rolled out across the entire country, it demonstrates an effective example of the commercial opportunity to scale up renewable energy technologies. Along with solar water heaters, the project markets various solar photovoltaic products such as portable indoor and outdoor lighting, solar water pumps and small solar photovoltaic power generating units. All the solar products are manufactured domestically in a factory in Bangalore, offering employment opportunities for local residents. These additional solar products are not included in the emission reduction calculations for this specific project.

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#### Infrastructure development

The project is facilitating the installation of new energy infrastructure within the country, including the required supporting structures and piping to enable the solar technology to scale.

#### Job creation

The programme employs local residents for manufacturing, distribution, installation and maintenance roles. Approximately 160 employees are directly employed, of which about 110 are in production, 20 are in office administration and 30 are field staff (marketing, sales and customer care departments).

There are also approximately 300 authorised dealers who each employ on average four to five staff plus numerous sub-contractors as regional and local sales agents.

#### The region

India has a population of 1.25 billion – a number which is rapidly growing and becoming increasingly urban. Subsequently, household energy needs for cooking, lighting and water heating are accelerating. Solar water heating units not only displace electricity which is primarily drawn from a fossil-fuel dominated grid, but can also help reduce peak load demand and the associated blackouts from a shortage of grid supply. In a country with abundant solar resources, solar water heaters allow for on-demand access to hot water even when there are power cuts, making the technology more reliable than the conventional use of electric systems.

#### Location

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