Source: MicroEngergy International

SOLAR WATER HEATER – THERMOSYPHON TYPE

Product Catalogue - 2014

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EUROPEAN MICROFINANCE PLATFORM
NETWORKING WITH THE SOUTH

e-MFP ACTION GROUP
ON MICROFINANCE
AND ENVIRONMENT

Description and Working Principle

A solar water heating (SWH) system is an autonomous system designed to provide hot water to individual households or small businesses. Installed on a rooftop, the system's collector absorbs sunlight, and the heat energy is transferred to water. The heated water flows automatically by the thermosyphon principle to a storage tank where it can be accessed for consumption through piping when it is needed. Denser cooler water is displaced back into the collector, and the process repeats.

Technical Characteristics

Average size (for a 150 liter system)	1630m * 1650m * 1250m
Average system capacity	100 – 700 liters
Average weight (for an empty 150 liter system)	95 kg
Fuel type needed	Solar irradiation
Temperature range for water	40 °C – 80 °C
Product lifetime	15 – 20 years
Storage time without sun	24 – 48 hours

Ease of Distribution, Installation and Maintenance

Considering the weight and size of the system's components, transportation vehicles are needed for distribution. If the system is packed in separate boxes, last-mile transportation can be done in batches and with smaller vehicles. Assessment of the location is necessary to: avoid shading, design hot water distribution for optimal performance, as well as to evaluate the suitability of the roof structure to support the weight. Hence, installation requires suppliers or local plumbers with appropriate technical skills. SWHs of good quality will work without supervision and require only low end-user maintenance.

Typical maintenance work:

- Cleaning of the solar collector
- Visual inspection for leaks and intact insulation of pipes and tank
- In case of painted surfaces: redo painting every 2-3 years to prevent corrosion
- Periodic tank draining to clear sediment
- Occasional leaks in the plumbing can be repaired by ordinary plumbers

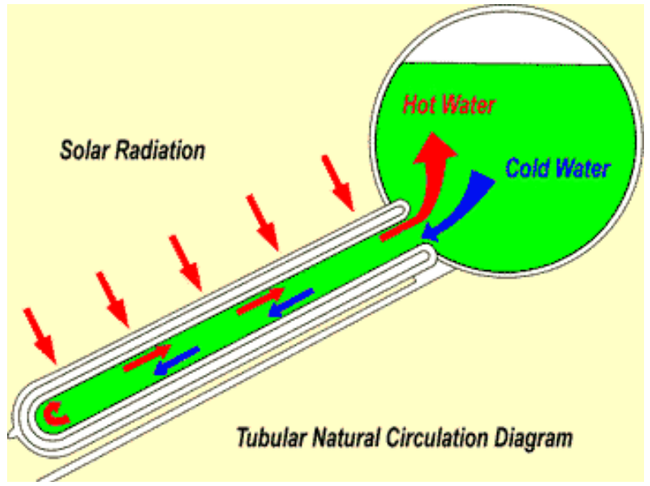
Technology Options

The product can be adapted to the local context in many ways, such as adding electronic controllers and heat exchangers in order to provide constant hot water at a precise temperature or to use the system for space heating in zones with low ambient temperatures. Hot water pipes can also be insulated with various qualities of insulation to prevent heat loss.

Price Range

A complete setup for a small house starts at around USD $460. According to the type of usage and scale of the project, costs can vary in respect to the specifications required.

Type of target group	Price range (USD)
Households (ca. 30 liters per person per day)	USD $460 - $1050
Small businesses with larger demand	USD $600 - $7000



Source: Porta Energy

Source: Jeff Morgan, Alamy

Type of Financing

Microfinance loans are provided mostly on an individual basis, for example microenterprise energy loans or home improvement loans. Financial or operational microleasing is more suitable for SMEs, but can also be provided to households. Among the businesses that can be targeted with this technology are small family owned hotels and restaurants, laundry services, and farmers using hot water in their production processes or for disinfection of equipment.

Economic and Social Impact for End-users

A SWH can offer a long term hot water solution for households and small enterprises. It presents the opportunity to replace solid and fossil fuels, such as firewood, coal, electricity or gas used for heating water. The replacement of such fuels reduces the expenses of households and small enterprises. Hot water is used for health, hygiene and comfort purposes to improve life quality standards.

For example, for an average household in a rural area that consumes 65 liters of water per day, an SWH with a capacity of 100 liters can bring savings of USD $65 per year by substituting the use of charcoal. In this case, the payback period of this technology is up to 4 years. However, such break-even points vary largely due to the equipment's size, type of fuel replaced and consumption patterns.

Benefits for the MFI

SWH can significantly reduce business-related hot water costs and improve the quality and range of services offered increasing the end-user's ability to repay loans. Furthermore, through the inclusion of SWH in a loan portfolio, an MFI can attract new customer segments such as SMEs engaged in the food, restaurant and hospitality industries.

Environmental Benefits

Environment: it reduces pressure on natural resources, or the cutting of trees when firewood is used for heating purposes. It reduces particulates emissions, fire hazards and their impact on forests.

Climate change mitigation: reduction in greenhouse gas emissions: A typical SWH can save up to 400 kg of CO_2 per system per year, by reducing the use of firewood, natural gas and other fossil fuels, as well as electricity from the grid.

Climate change adaptation: it can reduce the vulnerability due to degradation of local environment (if it offsets local deforestation), and the vulnerability to fossil fuels and electricity cost and distribution.

Potential positive synergies with: improved cooking oven, micro-enterprises dealing with food preparation or ecotourism.[1]

References

- National Geographic Environment, Jeff Morgan, http://environment.nationalgeographic.com/environment/green-guide/buying-guides/water-heater/shopping-tips/
- Porta Energy, http://www.porta-energy.com/TRX_Solar_Water_Heater.htm

[1] For further information on potential synergies check the other product catalogues for EE and RE technologies

European Microfinance Platform

The European Microfinance Platform [e-MFP] was founded formally in 2006. e-MFP is a growing network of over 120 organisations and individuals active in the area of microfinance. Its principal objective is to promote co-operation amongst European microfinance bodies working in developing countries, by facilitating communication and the exchange of information. It is a multi-stakeholder organisation representative of the European microfinance community. e-MFP members include banks, financial institutions, government agencies, NGOs, consultancy firms, researchers and universities.

e-MFP's vision is to become the microfinance focal point in Europe linking with the South through its members.

e-MFP Microfinance and Environment Action Group

e-MFP Action Groups facilitate synergies among e-MFP members and encourage them to implement activities together, thus contributing to the advancement of the microfinance sector.

The aim of the e-MFP Microfinance and Environment Action Group is to bring together microfinance practitioners to discuss and exchange experiences in dealing with environmental issues and to create new practical tools to advance environmental microfinance. The Action Group is also intended to act as a think tank that disseminates its results among e-MFP members and the microfinance sector at large with a view to increasing the awareness of and commitment to act on these issues. It is meant both as an internal knowledge-sharing and external awareness-raising platform that serves as a reference in the microfinance sector.

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