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NATIONAL PROGRAM FOR DEVELOPMENT OF SOLAR WATER HEATERS MARKET IN RWANDA SOLARWANDA PROGRAM



There is the potential to use solar energy as an energy efficient method of heating water, instead of using electricity. For developing countries, the SWH technology has great potential to limiting the import of fossil fuels and would lead to economic growth and jobs through adoption of the technology at a local level. It is not very complex and local supply chains could be set up. It would still need some form of incentive for adoption but there are models to make the technology economically viable as shown in the recent studies in the different countries around the world. Regulations such as that requiring the technology to be mandatory for new residential houses like did the Israel and Spain would make its adoption easier.

In terms of economic and social benefits, the technology can contribute to sustainability especially as it is relatively simple and could be delivered by locally trained installers with local supply chains in the main. This would lead to jobs and to a better quality of life, as well as minimize energy bills and dependency on fossil fuel imports with their corresponding vulnerability to price fluctuations. It is a safe technology avoiding fire and other health risks. It is particularly applicable to developing countries for hot water production.

The use of solar water heaters in residential sector could have a major impact on the need for imported supplies of fuel so that security of energy supply would be improved. Most of these technologies lead to savings though some developments still need to be made commercially competitive. Maintenance costs are very low. In addition, many countries have a program of subsidies to develop demand and are improving training and quality assurance of suppliers. Solar thermal is not a complex technology for hot water provision and it has been available for many years, though it is improving all the time. Systems have been shown to work for decades.

Widespread utilization of solar water heaters can reduce a significant portion of the conventional energy being used for heating water in homes and other commercial and institutional establishments. Some of the utilitarian aspects that make them one of the most sought after solutions include:

Reduces fuel consumption:

A 100 litres capacity solar water heater can replace an electric geyser for residential use and saves up to 1500 units of electricity annually.

Saves utility cost on generation:

The use of 1000 solar water heaters of 100 litres capacity each, can contribute to a peak load shaving of 1 MW.

Environmental benefits:

A solar water heater of 100 litres capacity can prevent emission of up to 1.5 tonnes of carbon dioxide per year.

Highly durable: An average solar water heater has a life span of 15 years - 20 years.

FREQUENTLY ASKED QUESTIONS ON SOLAR WATER HEATERS

What is solar water heating?

Solar water heating is a system for heating water using energy from the sun. Solar energy is collected by a panel/collector, which is then connected by pipes to a hot water storage device such as a hot water cylinder.

What are the benefits of solar water heating?

Solar water heaters can help save water heating costs by reducing the amount of electricity and charcoal needed to heat water. By using sunlight to heat water instead of combustible sources or fossil fuel-produced electricity, fewer pollutants are being introduced into the environment. Solar energy is not affected by the current shortage of electricity and does not stop providing hot water during load shedding.

How much of my total hot water requirements can a solar water heater provide?

A solar water heater can provide between 50% to 90% of your total hot water requirements, depending on the climate and model of the solar water heater. When you don't use the electrical water heating element you will save 100% of your hot water power requirements.

By how much will replacing a conventional electrical water heater with a solar powered system reduce electricity consumption?

The electrical water heater uses on average between 50 – 70% percent of your household's monthly electricity bill. Replacing your electrical water heater with a solar powered system will reduce that percentage of your electricity consumption by up to 70%.

How hot can the water get?

Most solar water heating systems heat the water to between 70-90⁰C, but some can heat much higher than that. You need to be aware of over-performing systems so that you are not scalded by the hot water. Unless otherwise required the water temperature at the point of use should be at, at least 40⁰C for domestic fixtures such as baths, basins and showers and at least 45⁰C (in order to melt fats) for sinks. The temperature is not meant to exceed 55⁰ C at any point of use.

Can the solar panels produce hot water on a cloudy day?

It depends on the sunlight each day. The solar water heater is capable of producing hot water even with simple exposure to sunlight. During the cloud days a solar water heaters operate where a simple exposure to sunlight is happening. Bearing in mind that the climate of Rwanda, the exposure of solar radiation is considered adequate.

What are the life-cycle expectation of the solar water heating system ?

Each solar water heater system has a different savings profile which depends on various elements such as geographical area, hot water usage depending on the number of users and the size of the system. The expected life of the equipment can range from 15 to 20 years; most systems are guaranteed for 20 years.

Is the purchase of a SWH beneficial in terms of electricity costs for the family?

Depends on how often you spend hot water so electricity is consumed. Look how much is your electric bill. Each family has different needs depending on number of members, how big is the house, what appliances are used, the lifestyle of the household, etc. Giving importance to the electric bill will show you how beneficial will be to install the solar water heater. Generally, solar water heaters PIRSOL are equipped to satisfy even the most demanding customer / household.

Why it is important that solar system acceptable under SolaRwanda Program be tested by recognized international testing institutions before to be approved by EWSA?

The specifications on solar water heaters eligible under **SolaRwanda Program** focus on three main areas: quality, durability, performance and safety. Laboratory testing certificates confirm these requirements. As the payback periods are very important it is vital that the solar water heater is of a quality that ensures system longevity.

The mechanical performance tests e.g. hail, freezing and pulsation test (testing of the valves) are conducted to ensure that the minimum quality standards are met. The performance tests are conducted to determine how well the system works. The safety test determines if all the safety requirements are met, including electrical and mechanical safety criteria.

What are the standards to be met by solar water heaters before being approved under SolaRwanda Program?

The approved solar water heaters systems under the SolaRwanda Program must fulfill the requirements of **EN12975 & EN 12976** standards. These standards are recognized around the world as the reference standards for solar water heating systems. Test reports confirming that the solar water heaters have been tested against these standards should be submitted by interested suppliers to participate in SolaRwanda Program before being awarded the eligibility to work with EWSA.

How do I ensure the quality of the system I have purchased?

Purchasing a solar water heater system that is registered on the SolaRwanda Program ensures that the system and the supplier have been checked and audited to be complying with the **EN12975 & EN 129 76** standards for solar water heaters, not only safeguarding you as a consumer but also giving you greater assurance of the system's quality. Buying EWSA's registered system means you qualify for a rebate, making your purchase good value for money.

How to know if my house is a good place for a solar water heating system?

The first consideration when installing a solar heating system is the site. If the location of the house has enough water all the times and the house has a strong roof with minimal obstructions and shading, it should be a good candidate for a solar water heating system.

An EWSA registered installer from a registered supplier will assist you in determining if your house has a connection to EWSA water network system and has the minimum required water pressure with and check if the house has a proper orientation for the installation of the SWH system. If your house's roof doesn't have enough space, the system can also be installed on a separate stand installed aside the house

How much does a typical system cost and how much is the rebate?

Costs can only be provided after making a detailed inspection of a customer house and taking into account hot water usage habits. The upfront cost of a solar water heater (including installation) is higher than electric or gas water heaters but the savings on your electricity bill will compensate for this over time. Once you have paid back your system, your hot water is for free!

How much can it save in your typical electricity bill?

An electrical water heater uses between 50 – 70% of the electricity used in a home. Typically taking overcast weather and usage patterns into account, 70% of this energy can be displaced by a solar system.

What is the typical payback period for a solar water heater?

With the current rebates in place paybacks are typically between 3-5 years or less, depending on geographical area, water consumption patterns, number of people in the household, type of system chosen and energy cost.

Who are the EWSA partners in SolaRwanda Program?

The World Bank (GEF) and the Nordic Development Fund (NDF) are the financing partners and EWSA through SolaRwanda Program is the designated agency responsible for the operation of the SWH Financing Scheme (**SolaRwanda Program**). Participating suppliers and installers in the scheme have been selected based on the selection criteria established by EWSA. Beside these institutions indicated above, EWSA is working with private companies (Eligible Suppliers) to spread the technology of solar water heating systems.

If a customer order a solar water heater from an eligible supplier , what exactly will he/she get?

You will receive a full solar water heater equipped with all necessary components (valves, pipes material, screws, etc.) and the bases of the solar (tile roof or flat roof) that require a plumber to install and make the solar heater operational.

How if the total cost of the SWH is bigger that the available amount of loan and grant from EWSA?

In case the total cost for installing a solar water heater to a customer is bigger than the total amount of grant and credit allowable to the customer from SolaRwanda Program, the customer must pay the outstanding amounts not covered by grant and credit directly to the supplier before the installation is done.

Requirements for EWSA customers to receive SWH from SolaRwanda Program

▪Have electricity and water connection from EWSA with water connection of a minimum water pressure of 2 bars from water distribution system

▪Sign a 'contract participation form' to qualify for the SolaRwanda Program which indicate the credit to be given by EWSA, which will be reimbursed by the customer to the account **No: 123.00.73 of EWSA** located in the National Bank of Rwanda (BNR) after the installation of the SWH by the selected supplier .

▪Pay **30,000 RWF** of application fees to EWSA account **No: 0400013646-02** located in **Bank of Kigali**

▪Not acquire a second SWH for the same house under the SolaRwanda Program. If the client has two properties and two separate EWSA electricity and water meters he can install one SWH in each property under the SolaRwanda Program.

▪Reimburse the loan to be given by EWSA in the process of acquiring solar water heater through the SolaRwanda Program, and accept to pay the outstanding amounts not covered by grant and credit directly to the selected supplier before the installation of the solar water heater.

Available Financial Incentives to Customers

SWH Size	200 Liters	300 Liters
Grant Amount (Rwf)	186,000	279,000
Loan Amount (Rwf)	278,000	558,000
Loan Recovery Period	24 Months	24 Months
Monthly Loan Reimbursement (Rwf)	15,000	23,500

Eligible Suppliers under SolaRwanda Program

1. BALTON RWANDA LTD

Contact Person

Mr. Bosco

TeL: 0788389060

E-mail: bosco@balton.co.rw

2. MANUMETAL LTD

Contact Address

TeL +250 252 575673

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E-mail: therancendisanga@gmail.com

3. DAVIS & SHIRTLIFF RWANDA LTD

Contact Person

Thacien Niyonsaba

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4. ENTREPRISE RUTAGARAMA FIDELE

(ERF)

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Rutagarama Fidele

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