

## **Solar Water Heater One Step Towards Sustainable Development**

**Dr. Lonarkar Pravin Pandurangrao**

Dept. of Public Administration

B. Raghuanth College, Parbhani

Email- [lonarkarpravin@gmail.com](mailto:lonarkarpravin@gmail.com)

Mob. No- 9518787205

### **Abstract:**

The United Nations has set a goal of achieving 17 sustainable goals by 2030. The seventh goal is to provide affordable and clean energy. This paper tries to a light focus on it. The sun is the powerhouse of the universe. It is a ultimate source of energy for the earth and it is the only source of energy which can be harnessed completely without disturbing the natural cycle of life. Humans have done a great deal of damage to nature to satisfy their hunger for development, So now that it is human duty to use Harness this divine source of energy for the well-being of nature. Over two-third of worlds electric power comes from burning coal. According to the U.S. Department of Energy about 18 percent of home energy use goes towards heating water. When someone burn fuel to heat your household water. It produce carbon dioxide, nitrogen oxides, sulfur dioxide, and the other air pollution and wastes created. It contribute to a number of negative environmental and health effects. Solar water heater is one of that magical green and clean energy product for healthy, safe, and clean environment. About 80 percent of the sun's radiation is turned into the heat energy needed to obtain hot water. It reduce the increased load on traditional means of power such as electricity, LPG and firewood.

**Objectives of the Study:** To study the use of solar water heaters in the world.

**Data collection technique:** Apart from primary data, secondary data has been used for this paper. It includes Library resources, Internet Base data, study reports etc.

**Keywords :** Solar water heater, Natural resources, Environment Protection, Sustainable development.

### **Introduction**

The process of human development depends on the elements in nature. Although humans have made progress in many areas using the resources of nature, these natural resources have some limitations. These resources are not unlimited. These resources will be destroyed if not used properly. Humans do not have the ability to regenerate destroyed natural resources. This will upset the balance of nature and threaten the very existence of life.

It is not possible to stop the process of development. Protecting nature and accelerating the process of development is one of the biggest challenges facing human civilization today, from this came the concept of sustainable development. Already causing massive harm to biodiversity the balance of nature has been disturbed it has created many problems. Therefore, it is human responsibility to protect biodiversity. Global warming is one such challenge. Sustainable development of the environment is possible if human beings turn this challenge into an opportunity. The use of solar water heaters should come forward as an effective plan to protect the environment. It can prevent global warming as well as the use of natural resources. It needs to be effectively disseminated in developed, developing and underdeveloped nations.

### **Working Process of solar water heater:**

The solar water heater is used to heat water by using sunlight it mainly consists of Three components 1. Solar Collector (A Thermal Panel or Evacuated Tube which is installed on the roof) 2. Insulated hot water storage tank and 3. Cold water tank. The solar water heater absorbs light by means of a collector placed on the roof and converts it in to heat it passed this heat to water tank this exchange is triggered by the thermal regulator. This system can therefore be used to produce hot water at a constant temperature throughout the year without emitting any carbon dioxide.

### **Types of solar water heater:**

There are two types of solar water heater 1) Flat Plate Collectors (FPC) based Solar Water Heaters 2) Evacuated Tube Collectors (ETC) based Solar Water Heaters.

#### **Flat Plate Collectors (FPC) based Solar Water Heaters :**

The solar radiation is absorbed by Flat Plate Collectors. It is known as traditional Collector type water heater. It consists of an insulated outer metallic box covered on the top with glass sheet. Inside there are blackened metallic absorber sheets with built in channels or riser tubes to carry water. The absorber absorbs the solar radiation and transfers the heat to the flowing water.

#### **Evacuated Tube Collectors (ETC) based Solar Water Heaters:**

Evacuated Tube Collector are the most efficient collector available. It is made of double layer borosilicate glass tubes evacuated for providing insulation. The outer wall of the inner tube is coated with selective absorbing material. This helps absorption of solar radiation and transfers the heat to the water which flows through the inner tube. The space between the layers is a vacuum, so very little amount of heat is lost from the fluid.

#### **Benefits:**

Solar water heater system does not depend on fossil fuels and takes energy from the sun to heat stored water. It, therefore, saves money, which is a major advantage of solar heating systems. Energy from the sun doesn't cost anything, so no charge from electrical utilities is needed, some benefits are.

#### **Environmental Benefits :**

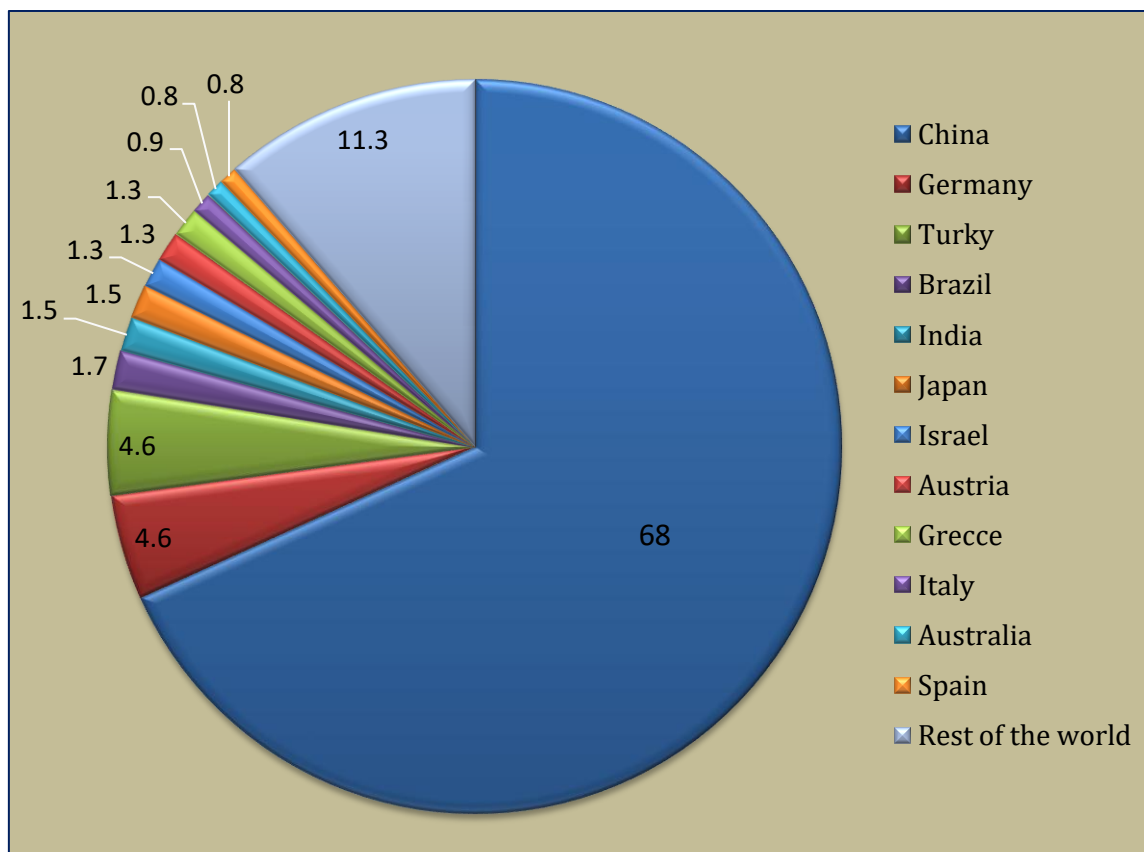
According to a study in United States most of Americans use electricity to heat their water. Over 1/3 of United States electric power comes from burning coal. Burning coal pollute air and contribute to a number of health and negative environmental effects. Solar water heaters do not pollute air, by investing in one, it will be avoiding carbon dioxide, nitrogen oxides, sulfur dioxide, and the other air pollution and wastes created when burn fuel to heat your household water. When a solar water heater replaces an Electronic water heater, the electricity displaced over 20 years represents more than 50 tons of avoided carbon dioxide emissions alone. Carbon dioxide traps heat in the upper atmosphere, thus contributing to the "greenhouse effect." The result of Market Assessment Survey carried out by Green tech Solutions indicate the 100 litres capacity Solar water heater system can replace an electric geyser of 2 KW capacities, for residential use and may save up to 1500 units of electricity annually.

#### **Economic Benefits:**

Solar water heaters offer long-term benefits that go beyond simple economics. "The Florida Solar Energy Center (FSEC—see Source List) studied the potential savings to Florida homeowners of common water-heating systems compared with electric water heaters. It found that solar water heaters offered the largest potential savings, with solar water-heater owners saving as much as 50% to 85% annually on their utility bills over the cost of electric water heating". "The FSEC analysis illustrates that the initial installed cost of the solar water heater (\$1,500 to \$3,000) is higher than that of a gas water heater (\$350 to \$450) or an electric water heater (\$150 to \$350). The costs vary from region to region, the solar water

heater can be more economical over the lifetime of the system than heating water with electricity, fuel oil, propane, or even natural gas because the fuel (sunshine) is free”.

### Use of Solar Water Heater in the world



Source- REN21-2013-GTZGmbh

Although solar water heaters are beneficial, there is a lack of awareness in the world about their use. The above graph shows the number of users of solar water heaters in the world. China has the largest share of using solar water heater systems in the world at 68 percent. It is followed by Germany and Turkey at 4.6 per cent. In countries with huge population like India the very low use of solar water heater (India 1.5%) is a matter of concern. The low percentage of use of solar water heaters in backward and developing countries is it related to its cost. In backward and developing countries have the highest carbon emissions. There the use of solar water heaters can be a boon.

### Recommendation:

- 1) Solar water heater prices should be kept low in backward and developing countries.
- 2) Subsidies should be provided for the use of solar water heaters in developing

countries.

- 3) The use of solar water heaters should be made mandatory in developed countries.
- 4) Raise awareness about the use of solar water heaters globally.

### **Conclusion:**

The very existence of the whole organism depends on nature. Out of several renewable energy resources, solar energy is the best to rely on. Global warming is a serious issue. The very existence of biodiversity depends on it. From now on, steps were taken in that direction Sustainable development can be achieved. Sustainable development of the environment is possible if human beings turn this challenge into an opportunity. Solar water heater is one of that magical green and clean energy product for healthy, safe, and clean environment.

### **References:**

- 1) <https://sustainabledevelopment.un.org/?menu=1300>
- 2) Renewables2019, Global Status Report, REN21 Secretariat, c/o UN environment ,1 rue Miollis, Buldig VII75015 Paris, France.
- 3) Report on Energy Efficiency and Renewable Energy(March1996) Department of energy United State of America, DOE/GO-10096-050FS119,
- 4) [www.ren21.net](http://www.ren21.net)
- 5) [https://www.undp.org/content/dam/india/docs/user%E2%80%99s\\_handbook\\_on\\_solar\\_water\\_heaters.pdf](https://www.undp.org/content/dam/india/docs/user%E2%80%99s_handbook_on_solar_water_heaters.pdf)
- 6) <https://sustainabledevelopment.un.org/sdg7>