



A SOLAR WATER HEATER PROJECTION BY CENTRE FOR APPLICATION OF RENEWABLE ENERGY

SALIENT FEATURES OF SOLAR WATER HEATING SYSTEM



- Solar Hot Water System turns cold water into hot water with the help of sun's rays.
- Around 60 deg. – 80 deg. C temperature can be attained depending on solar radiation, weather conditions and solar collector system efficiency
- Hot water for homes, hostels, hotels, hospitals, restaurants, dairies, industries etc. Can be installed on roof-tops, building terrace and open ground where there is no shading, south orientation of collectors and over-head tank above SWH system
- SWH system generates hot water on clear sunny days (maximum), partially clouded (moderate) but not in rainy or heavy overcast day
- Only soft and potable water can be used Stainless Steel is used for small tanks whereas Mild Steel tanks with anticorrosion coating inside are used for large tanks
- Solar water heaters (SWHs) of 100–300 litres capacity are suited for domestic application.
- Larger systems can be used in restaurants, guest houses, hotels, hospitals, industries etc.



BENEFITS



Environmental benefits

A SWH of 100 litres capacity can prevent emission of 1.5 tonnes of carbon dioxide per year. Life : 15-20 years

Approximate cost :

Rs.15000- 20,000 for a 100 litres capacity system and Rs.110-150 per installed litre for higher capacity systems

Payback period :

when electricity is replaced	3-4 years
when furnace oil is replaced	4-5 years
when coal is replaced	5-6 years

Fuel Savings :

A 100 litres capacity SWH can replace an electric geyser for residential use and saves 1500 units of electricity annually.

Avoided utility cost on generation

The use of 100 SWHs of 100 litres capacity each can contribute to a peak load saving of 100 KW.



SOLAR WATER HEATING SYSTEM



Potential savings

The technical overall potential assuming that 75% of pucca houses of the country occupied by the owners will have solar water heaters could be taken as 140 million sq. m. of collector area. The achievable/economic potential based on purchasing power of people/ requirement of hot water in a year/ availability of space for installation of system/ availability of solar radiation etc. may, however, be taken as 35-40 million sq. m. of collector area



ELECTRICITY DIESEL SAVINGS



- A 100 lpd system (2 sqm of collector area) installed in a home can save 4-6 units of electricity/day depending on the place of installation & hot water use. On an average it could be taken as 5 units/day. Maximum average saving with 300 clear days, therefore, could be taken as 1500 units/year.
- Assuming 300 days of solar hot water use in Bangalore and 150 days in Delhi, the savings could be 1500 & 750 units per year respectively i.e. replacement of a 2 KW electric geyser working for 2 ½ hours in a day. Considering all parts of the country and maximum installations in areas where hot water requirement is more during the year, average saving could be taken as 1200 units/year/100 lpd system.
- 1 million such systems installed will be able to save 1200 million units of electricity/year. A 100 lpd system (2 sqm of collector area) installed in an industry can save around 140 litres of diesel in a year.



PEAK LOAD SAVING



- 1 system of 100 lpd can replace an electric geyser of 2 KW capacity in a home. 1 million such systems will replace 1 million geysers of 2 KW capacity each in homes. Assuming that at least 50% of geysers are switched on at a time, this will have a peak load shaving of 1000 MW.

CO₂ Reduction

- A 100 lpd system on an average saves up to 1500 units of electricity/yr. To generate that much of electricity from a coal based power plant, 1.5 tone of CO₂ /year is released in atmosphere. One million solar water heating systems installed in homes will , therefore, also result in reduction of 1.5 million tone of CO₂ emission in atmosphere.





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