

At places where water is hard and have larger chlorine content, if FPC based system is being installed, it must be with heat exchanger as it will avoid scale deposition in copper tubes of solar collectors which can block the flow of water as well reduce its thermal performance. ETC based systems will not block the flow of water but its performance may go down due to deposition of salt contents on inner surface of glass tubes, which could be cleaned easily once in a year or so.

Q. No. 5 What is the approximate cost of solar water heater?

Ans. Cost of solar water heater depends on size and type of system installed. Smallest size of a system is 100 liter per day, which means that it can deliver 100 litres of hot water in a day at 60 C. A 100 lpd capacity system is sufficient for a family of 3-4 members and it may cost Rs. 15,000 to Rs.22,000 in plains depending on the type of system. In hilly & N-E region, the cost may be 15 to 20% more.

The system cost does not include the cost of cold water tank, & its stand which is required if overhead tank is not installed in a house/ building. Cost of hot water insulated pipe line also, may be extra if number of bathrooms is more than one. Additional cost towards all these components may increase by 5 to 10%.

The cost, however, does not increase linearly with increase in capacity; rather it comes down proportionately as we go for higher capacity system.

Q. No. 6 Is there any subsidy available from Government?

Ans. No. The subsidy scheme has been discontinued w.e.f 12.08.2014 onwards.

Q.No. 7 Why should I go for a Solar Water Heater? What do I save from it?

Ans. A 100 litre per day capacity system suitable for 3-4 people can save up to 1500 units of electricity in a year depending on the amount of hot water used. It can also save around 140 litres of diesel in an establishment using oil fired boiler besides reducing greenhouse gas emissions in the atmosphere. Higher capacity systems will save higher amount of electricity/fuel oil besides reducing higher amount of GHG emissions.

Electricity is expensive and is not available due to power cuts in many areas when required for heating water. Solar Water Heater, since it stores hot water in an insulated tank, provides water all the time when required. Fuel oil is also expensive and creates pollution. Storing the fuel oil for long term use in commercial establishments is another problem.

The table below gives approximate likely electricity and money savings for a typical 100 liters per day system located in different parts of the country.

	Northern Region	Eastern Region	Southern Region*	Western Region*
Expected no. of days of use of hot water per year	200 days	200 days	300 days	250 days
Expected yearly electricity saving on full use of solar hot water (units of electricity)	1000	1000	1500	1250
Monetary savings at different prices of electricity, Rs/year				
Rs. 4/kwh	4000	4000	6000	5000
Rs. 5/kwh	5000	5000	7500	6250
Rs. 6/kwh	6000	6000	9000	7500

* The use pattern and savings for southern region pertains to the typical climate of Bangalore, while those for western region relate typically to Pune climate.

Q.No.8 What happens on cloudy/rainy day? Do I still get hot water?

Ans. On cloudy days also, if it is for a day or two, you still get warm water as water gets heated due to diffused radiation available in the atmosphere. The system, however, is either connected to an electric geyser in the house or an electrical back-up is provided in the storage tank of the system which is switched on when water is not sufficiently hot. So, you get hot water all the time even on rainy days.

Q.No.9 How do I decide about the size/capacity of the system to be installed?

Ans. For a house with one bathroom and 3 to 4 members, 100 liter per day capacity system should be sufficient. For more numbers of bathrooms, the capacity will increase accordingly due to pipe losses & more number of family members. Generally the capacity is decided based on hot water required in mornings for bathing. If the usage is in evening & at other times also, the capacity is decided accordingly. Some useful thumb rules for estimating the hot water requirement are given below:

Application	Typical Requirement of Hot Water at 60°C.
Household bathing using buckets	10-20 liters per person per bath.
Household bathing using shower with a mixing tap	20-30 liters for 10-15 minute bath
Shaving, while a tap runs	7-10 liters
Household bathing in bathtub (one filling)	50-75 liters
Wash basin with a mixing tap (hand wash, brushing of teeth, etc.)	3-5 liters per person per day.
Kitchen washing	2-3 liters per person per day.
Dishwasher	40-50 liters per wash cycle
Clothes washing machine	40-50 liters per cycle

Q.No.10 How do I assure that a good quality system is installed at my house?

Ans. Ministry has laid down some minimum technical requirements for installation of solar water heating systems in the field. These have been made mandatory for manufacturers and suppliers and are available on MNRE website: www.mnre.gov.in. These requirements are have been prepared in such a way that even a lay man can also check them and ensure that those are being adhered to by the manufacturers/suppliers. In case any manufacturer/supplier is found not sticking to these requirements, he may be blacklisted if informed to the Ministry.

Q.No.11 Are there any maintenance requirements?

Domestic solar water heating system do not need significant maintenance requirements. Occasional leakages in the plumbing could be easily repaired by common plumbers. In case quality of water is hard, scale deposition in the collectors may result over the years. This may require de-scaling with acids for which it is best to contact the suppliers. Broken glass may also have to be replaced by the suppliers. If outside exposed surfaces are painted, the paint may have to be redone every 2-3 years to prevent corrosion of the surfaces.

Q.No.12 Any trouble shooting guide for solar water heating systems?

Ans. Some of the troubleshooting steps are mentioned below:

Problem faced	Probable cause and remedies
No water in tap	<ul style="list-style-type: none">- No cold water supply- Wall at the outlet of system closed- Air lock in the pipes
Water not heated at all, although cold water flow is normal	<ul style="list-style-type: none">- Consumption of hot water may be too high; Check use points and use pattern- Collector may be shaded- No flow of water through the Collector as it might be choked due to scaling; Get it checked from the manufacturer
Water not hot enough or sufficient quantity of hot wter is not available	<ul style="list-style-type: none">- Cloudy weather- Consumption too high- Frequent on-off of hot water tap- Collector dirty- Vapour lock in the collector which can be removed by allowing it to cool & draining the system- Partial choking of the collector
Little quantity of boiling hot water is received	<ul style="list-style-type: none">- Vapour locking in the collector- Pinched inlet/outlet pipes