

Solar Water Heating

Most areas in South Africa average more than 2 500 hours of sunshine per year, and average solar-radiation levels range between 4.5 and 8kWh/m² in one day.

- Use solar water heating to decrease electricity consumption.
- Possibly solar energy's foremost application, solar water heating can be used to completely replace existing electric hot water systems. Where large volumes of hot water are used frequently, it can augment an existing resistance heating system by 50% - 80%.
- Solar water heaters are between 40% and 80% efficient depending on the type and the climatic conditions.
- A correctly sized and installed solar water heating system can provide up to 80% of your hot water requirements.
- Like the hospitality industry Solar Water Heating is seasonal and the maximum capacity occurs in summer and coincides with most establishments' highest occupancy.

Application: Everywhere, particularly where electric systems can be completely replaced (for example: small guest houses). Larger facilities with central systems also have the potential for easy retrofitting.

Ease: 3/5

Availability 5/5

Requirements: North facing roof (NE to NW is also fine)

Flat or pitched

Accurate hot water usage figures (occupancy levels can also be used although this is not recommended for larger systems) are required for accurate system sizing.

There are two main types of solar collectors flat plat and evacuated tube. The most common type found in South Africa is the Flat plate collector. This consists of a flat copper plate, painted black, that has water tubes attached to the absorber plate. As solar energy falls on the copper plate and is absorbed, the energy is transferred to water flowing in the tubes. The absorber plate is mounted in a casing that



Flat Plate



Evacuated Tube

has a clear covering and insulation to prevent heat loss. Flat plate collectors are capable of heating water to between 60°C and 80°C.

Evacuated tube collectors produce higher temperature water and are more complex than flat plate collectors. Evacuated tube collectors consist of a series of tubes that contain a heat pipe to absorb solar energy and transfer it to a liquid medium. The tubes are evacuated (vacuum) so that there is very little heat loss from the tube to the environment making them more efficient than their flat plate cousins. Due to this higher efficiency vacuum tube collectors are capable of producing water at higher temperatures up to 120°C and are also suitable for industrial use.

Did you know?

To heat 100L of water from 18 to 60°C with an electric element takes 5.16 kWh (assuming 95% efficiency and no thermal losses e.g. pipes and geysers) releasing some 5 kg of CO₂ (0.978 kgCO₂/kWh) into the atmosphere

Costs: Installation costs range between R3000 and R8000 per 100L of hot water used per day. Cost range depends on the type of panel, whether new geysers are required, length of pipe runs and the complexity of the installation.

Payback: Depends on a number of factors but generally between 5 and 10 years.

Requirements to meet criteria:

- System is capable of producing at least 50% of hot water requirements
- Hot water meter has to be installed