Solar Water Heating Terminology

- Boost – The process where a heating component (such as an electric element or gas heater) is used to provide additional heating when solar-heated water is not of an adequate temperature.

- Closed loop: In a closed loop system the heat transfer fluid is pumped through the collectors and a heat exchanger is used to transfer heat from the collector loop to the water in the tank. Closed loop systems are used in areas where freezing conditions are common and the transfer fluid in the manifold is generally glycol or an antifreeze fluid. These systems are more expensive to construct and install, and require maintenance.

- Collector – The Solar Ray collector is the manifold with heat pipes and evacuated tubes inserted.

- Drainback: Drainback systems use water as the heat transfer fluid in the collector loop. The water drains by gravity back to the storage tank or an auxiliary (header) tank when the circulation pump stops, thus preventing overheating and freezing. This system provides a high level of protection as it does not rely on valves or controllers that could fail under adverse freezing conditions. The disadvantage of the system is that it requires a pump with a high static lift to fill the collector when the system starts up, it is also important that all piping is sloped, ensuring that the collector is at the top and the tank at the bottom. U-bends are strictly not allowed.

- Flow Line – indicates the plumbing line running from the tank (or heat exchanger) to the inlet of the collector. This line incorporates the circulation pump.

- Header – is the copper “heat exchanger” pipes in the solar collector through which the water flows.

- Heat Pipe: A copper pipe that sits inside the evacuated tube and is inserted into the collector manifold. A small volume of liquid acts as a heat transfer fluid. It absorbs heat via evaporation, and transfers heat to the system fluid via condensation.

- Insolation – solar radiation level, expressed in kWh/m2/day

- Manifold – Refers to the solar collector which contains the header through which potable water flows.

- Open Loop or Direct Flow: Open loop active systems circulate water directly from the tank, through the collectors. This design is efficient and lowers operating costs, but is not appropriate if the water supply is hard because calcium deposits quickly build up in the bottom header of the collector. Open loop systems have limited freeze protection, usually achieved through controller functions; by running the pump and forcing warm water from the tank to the collector, when the collector temperature approaches zero.

- Pressure Limiting Valve (PLV): A valve installed on the cold water mains line designed to limit system pressure to a set design pressure. A typical value is 500 kPa.

- Pressure temperature relief valve (PTRV) – installed on the hot water storage tank to relieve pressure, and excessive temperatures.

- Return Line – indicates the plumbing line running from the outlet of the collector back to the tank.