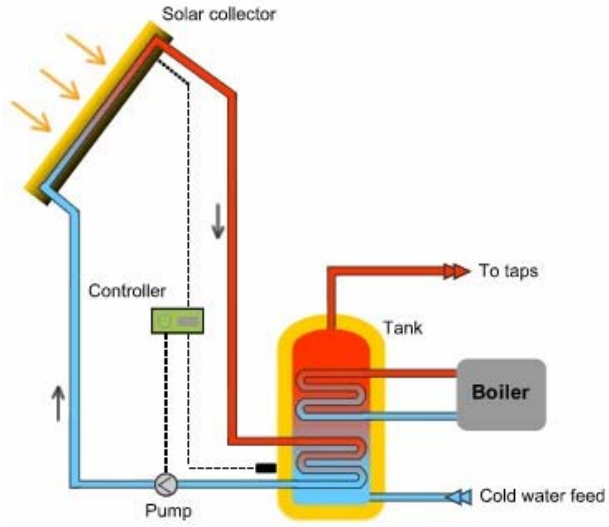
Vacuum Tube Solar Collectors (DH)

Solar energy is free and can be harvested very effectively to produce the majority or your hot water needs.
There are three basic types of solar collector; the Flat Plate type, the Heat pipe Vacuum tube and the Direct heated Vacuum tube types. This data sheet will look at the last of these.

Although it is possible for solar collectors to be used to produce enough hot water for space heating systems the surface area of collectors and the capacity of the storage vessel required means the system would be grossly over-sized during the summer conditions when heat is not required. It is therefore not recommended, either technically or economically to do this. The more common use for these systems in the UK is to provide a stored capacity of domestic hot water (DHW) for washing.
Systems are normally sized to meet the DHW demand during the summer conditions when collection efficiency is at its highest. In Spring and Autumn a suitably sized system would be expected to produce about 80-85% of the demand and in winter this could fall to 30-50%, hence a secondary heating input will be needed from the boiler.

A typical system comprises a solar collector mounted on a sloping, south facing roof through which water is pumped. Solar energy is concentrated inside the vacuum tube and heats water directly as it flows through a thin copper tube passing inside each vacuum tube. The heat gathered during each pass accumulates such that the emerging water temperature is heated to just below boiling point. This is pumped to the heat transfer coil in a thermal storage tank where the DHW is to be stored.



Horizontal mounting of the collector tubes ensures optimum solar collection is achieved across the seasons, irrespective of the angle of the sun, significantly increasing efficiency in winter when it is needed most.

Sensors at the panel and in the tank inform the controller of the temperatures, which controls the pump and boiler, drawing heat from the collector whenever available and bringing the boiler on only when required.

Direct heated vacuum tube solar collector system can achieve as much as 93% solar conversion efficiency, requiring less collector area than flat-plate and heat-pipe systems. They will reduce energy bills and carbon dioxide emissions. They can enhance the value of your property and help to obtain a high efficiency rating whilst providing some protection against uncertain energy prices and shortages in the future.

The specially designed thermal store is highly insulated and designed to be held at an elevated temperature of up to 90°C, so as to maximize collection of the available solar energy every day. Solar systems have a life expectancy of at least 30 years and require almost no maintenance. We provide a full design and installation service using equipment of the highest quality installed by fully accredited Solar Trade Association teams that qualify for grants, currently being offered at £400 in England and Wales.

Planet Energy Solutions
Renewable Energy Systems
16 Carleton Rise, Welwyn, Hertfordshire, AL6 9RF
Tel. 01438 712398 ~ e-mail planetenergy@btinternet.com ~ www.planetenergy.co.uk
Design, Supply & Installation of Solar Thermal, Photovoltaic, Hydro & Wind Power, Biomass, Heat Pumps, Steam & Ind. Fluids systems