



Morri Consult Ltd

Solar Thermal Technology (hot water)





Solar Thermal Systems

Solar Thermal technology generates hot water from daylight and is one of the most cost-effective forms of renewable energy in the UK. Solar Thermal Panels can help to reduce hot water bills and can be used in conjunction with other renewable technologies, such as Solar PV, biomass and Ground Source Heat Pumps.

Benefits of Solar Thermal Systems

Installing a Solar Thermal System brings a range of financial and environmental benefits, including:-

- Reduction of CO2 emissions.
- Use of free energy source (the sun)
- Reduces use of fossil fuels (coal, gas, oil)
- Consumers enjoy more independence from Utility company
- Advantages over other renewable energy technologies – well suited to the urban environment and silent operation.
- Immediate and substantial saving on hot water Bills.
- Extended boiler life.
- Excellent return on investment
- Adds value to the property
- Renewable Heat Incentive Payments/Tariff.

Typical System Components

- Solar collector panel
- Hot water store (usually twin coil tank)
- Flow and return pipes
- Heat exchange fluid
- Means of circulation and control (control module)
- Means of controlling temperature fluctuation typically from -15°C to 250°C
- Means of control of the legionella bacteria
- Delivery of hot water to the outlets

Applications

- Domestic Water Heating
- Commercial Water Heating
- Domestic Space Heating
- Under-floor Heating
- Heating Swimming Pools (indoor and outdoor)



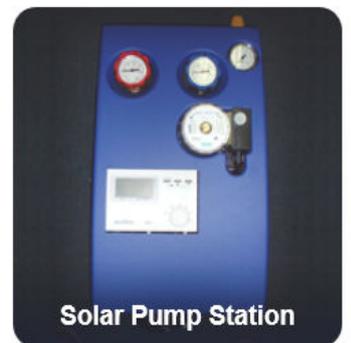
On-roof System



In-roof System



Solar Thermal Array



Solar Pump Station

Earnings

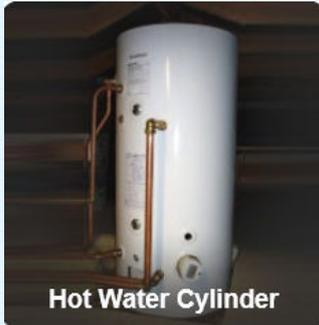
You may be able to receive payments for the heat you generate from a solar water heating system through the government's Renewable Heat Incentive. This scheme should be launched in Summer 2013.

Keep in touch with Morri Consult Ltd for full details.



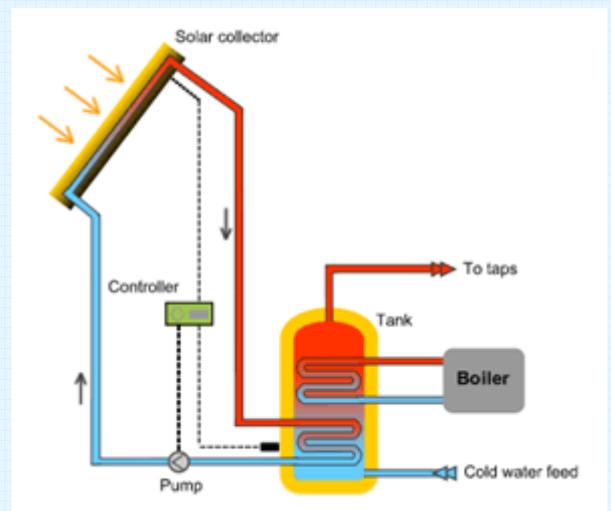
Back-up Heat

As can be seen in the diagram, the tank has a separate heat exchange coil, which can be used to provide a supplementary heating when solar energy is not available or is inadequate.



How It Works

In its simplest form a solar thermal system works as follows; solar panels (known as collectors) absorb as much of the sun's heat as possible. These panels contain liquid, which once heated travels to a coil in the hot water cylinder and transfers heat to the water store. So over a period of time a full tank of hot water is created. The time period depends on the intensity of the sun, the size and efficiency of the collectors and the size of the hot water tank.



Flat Plate Collector

Flat plate collectors are similar to a velux roof window and consist of fluid filled metal "envelope" with a selective black coating that greatly improves absorption of solar energy. This is housed in a glazed, insulated box. The collector is mounted usually on a roof and connected to the hot water system of the building in a similar way to a conventional boiler, using insulated pipework that feeds a coil in the hot water cylinder. During new build they can be roof integrated prior to tiling so as to minimise impact.

Water is circulated either by thermo-syphon or, more commonly using a circulating pump. The pump is controlled in such a way that when the temperature of the collector is lower than the temperature in the hot water system (known as hysteresis) the pump is switched off. Flat plate collectors need to be protected against frost. This is achieved by the addition of antifreeze to the heating circuit, or by arranging the system such that the collector drains down when the pump is switched off.

A typical 4 person family home would require 3-5m² of panel.

Evacuated Tube Collectors

Evacuated tube collectors consist of around 20 vacuum tubes typically around 100mm in diameter and 2 metres in length. They mount onto the roof plane on a framework. Each tube is fitted with a heat transfer fluid, the upper ends of which are connected to a manifold heat exchanger that is connected to the primary circuit of the building.

Evacuated Tube Collectors are more efficient than Flat Plate Collectors. Typically 3m² of Flat Plate is equal to 2m² of Evacuated tube. Although more expensive to buy, evacuated tube can be less time consuming to install and are less position sensitive as the tubes can be rotated in their housing to attract maximum amounts of solar energy. They also have the advantage of being suitable for fitting to outside walls



Facts about Solar Thermal Technology

1. Solar thermal technologies use the sun's heat energy to heat substances (such as water or air) for applications such as space heating, pool heating and water heating for homes and businesses.
2. Solar thermal collectors can be mounted on the roof of a building or in another location that has exposure to the sun i.e. a garden or field.
3. Solar energy provides "power security", enabling you to continue getting power even when utility power is disrupted.
4. Water heating accounts for approximately 25% of the total energy used in a typical single-family home. An electric water heater is the single biggest energy user of all appliances in the home. A solar energy system can give between 5 and 14% return on investment depending on the system and property.
5. Home solar heating can lead to savings of 85% on utility bills over the costs of electric water heating depending on the system and property.
6. Using solar energy is free and it is an environmentally friendly source of power.
7. Solar energy can be integrated with existing energy methods, such as wood stove and demand boiler, to produce 100% of the required thermal loads.
8. Solar water heaters do not pollute. By investing in one, you will be avoiding carbon dioxide, nitrogen oxides, sulphur dioxide, and the other air pollution and wastes created when your utility generates power or you burn fuel to heat your household water. When a solar water heater replaces an electric water heater, the electricity displaced over 20 years represents more than 50 tons of avoided carbon dioxide emissions alone.

Summary - Why Install A Solar Thermal

For the financial benefit

Return On Investment. RHI Scheme. Free Energy.

For the environmental benefit.

Reduce your homes carbon emissions

For a lifestyle change.

Do your bit for the UK economy. Utilise proven technology.

For independence and peace of mind.

Protect yourself from increasing fossil fuel energy costs.

Our Policy

At Morri Consult we are happy to discuss all forms of alternative energy sources with you, to allow you to make the right decision. We won't try to sell you anything that is not economically right for you. We believe in giving it straight, in terms of the facts and figures, and what you can expect from an alternative energy source.

We do not supply equipment from a single supplier; we will advise and help you select the product that best meets your needs. Above all we are always around to answer your questions and deal with any issues that may arise. We are professionally qualified engineers and passionate about renewable energy technology.

Morri Consult Limited

New Dunsley Farm,
Brow Lane,
Holmfirth
West Yorkshire HD9 2SW
www.morriconsult.co.uk
info@morriconsult.co.uk
01484 689676