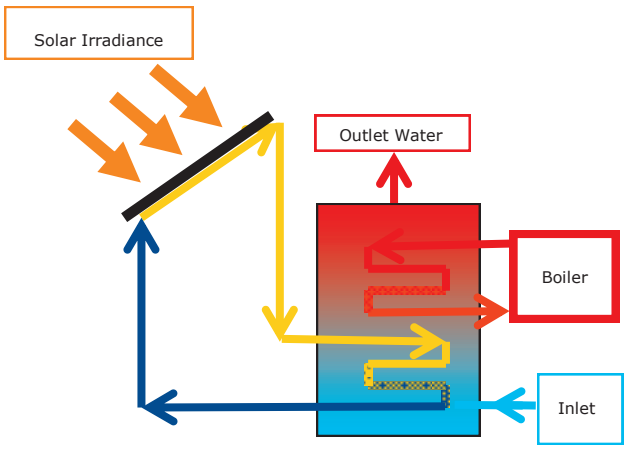
# Solar Thermal Heating

**With the introduction of the Renewable Heat Incentive (RHI) in June 2011, generating renewable heat has become more financially attractive. Solar thermal arrays benefit from being mounted in areas of no shading. With the abundance of roof space in wide open areas, solar heating presents a clear opportunity for the farming community. This fact sheet will guide you through how to establish if solar heating is suitable for you. Free impartial advice is available from Reaseheath on any renewable energy project.**

The aim of solar heating is not to fully meet hot water requirements but to increase the base temperature of the water that is supplied to a boiler/immersion heater. The diagram below shows how the embedded solar coil increases the base temperature of the hot water tank. The level of increase in temperature will depend on the solar irradiation that the panel sees. Water in the system is heated due to the radiation absorbing nature of the panel. In the summer a well-sized solar thermal system should supply 90-100% of your heating needs, giving temperatures of up to 50°C. This means the boiler/immersion heater won't have to work as hard, potentially reducing heating bills by over 25%.




Solar heating is not suitable for using with gas combination boilers. However, they are suitable with all other heating technologies, although space will be required for a new hot water cylinder with an embedded solar coil. It is not necessary to have a large daytime usage of hot water to fully take advantage of the system, as the tank will maintain the heat captured during the day. Solar heating systems require little maintenance and are easy to operate, with a rain shower sufficing for cleaning. Therefore solar thermal is ideal for operators with other time commitments.

**Key points to consider:**

- **Unshaded area required– shading reduces the heat gained from the solar thermal panel.**
- **Proven, mature technology with few risks**
- **Your installer must be MCS accredited to ensure eligibility for the RHI.**
- **Minimum roof space of 10 $m^2$.**

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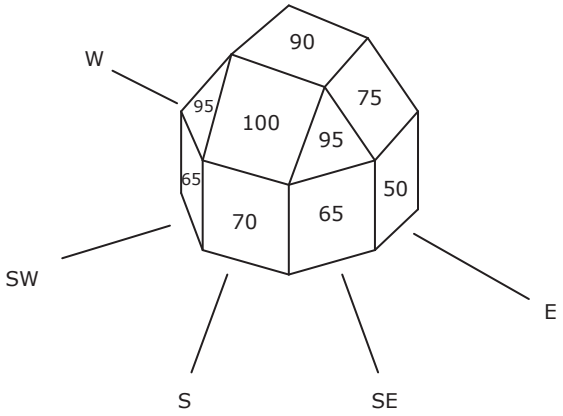
The optimum orientation for a solar heating array is to be facing due south at an incline angle of 35-45°. Solar arrays at differing angles/orientations will see less sunlight and therefore generate smaller temperature increases. The key point to note is that even a solar array facing due east/west can still receive 75 % of the optimum level as shown in the figure to the right. It is also important to reduce shading as much as possible in order to generate higher temperatures. Shading will reduce the solar irradiation seen by the panel, thereby reducing its performance.




| System Type | Size ($m^2$) | RHI (£/kWh) | Cost (£) | Energy Savings (kWh/year) | Annual Income + Savings (£) |
|---|---|---|---|---|---|
| Domestic | < $10m^2$ | 0.18 | < 5,000 | < 4,000 | < 800 |
| Commercial | > 20 $m^2$ | 0.17 | > 13,500 | > 10,000 | > 2,500 |

The table above shows system configurations, costs and expected savings. The size of system will be dependent on your hot water usage; domestic systems are based on meeting the hot water requirements of less than five people, whereas a commercial system is based on supplying the hot water requirements of twenty people.

Two bands have been proposed under the RHI which is due to come in June 2011, with solar thermal receiving the RHI for twenty years. The income generated from the a RHI will be deemed by the standard assessment procedure when installed and will increase with inflation annually. The RHI aims to provide solar thermal installations with rates of return of 6% with payback periods of 10-13 years achievable.

Calculations on the energy saved can be carried out using the Energy Saving Trust website *cash back tool* *www.energysavingtrust.org.uk*. Planning permission is required for systems occupying over 9 $m^2$ of roof space, however is relatively simple to obtain. System configurations will vary due to tank location and choice of panel.

If you decide that a solar thermal system is feasible, get in contact with a variety of MCS installers to obtain several quotes. If your system is not installed by a MCS approved installer you will not be eligible for the RHI. *www.microgenerationcertification.org*

***Reaseheath can offer free, impartial advice on any renewable energy project. Please contact us on 01270 613 195, email hub@reaseheath.ac.uk or visit our website for more details.***

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