

CASE STUDY 7 - STRAWBALE HOUSE WITH WIND & SOLAR Penwhilwr, St. Dogmaels

Rachel Shiamh decided to build a low impact straw bale home in 2002 after she moved into the shed on a plot of land she had bought. She spent several years living in the shed observing the nature and topography of the area before designing the building she wanted to live in. She wanted to create a home that harmonised with nature



and which had to be sensitive to the environment and built from natural and mainly local sourced materials. She wanted it to be powered by sun and wind and fuelled by its own woodland, with all waste to be composted on site. As a result she has built a sustainable building that uses renewable resources to reduce the CO2 impact on the environment. The solar water heating system was installed to compliment this ethos, which in conjunction with a wood burning stove is providing adequate hot water for her requirements. She also has a solar PV panel and a wind turbine to provide power, a rainwater harvesting system and waste composting Aquatron system.

The house is the UK's first two storey load bearing straw bale house. It is built out of straw bale bricks, without any supporting structure. The roof is fixed to a plate on top of the walls. Women's building team and straw bale pioneers, Amazon Nails, designed and assisted in the construction of the house while training those that wanted to learn about eco-building at the same time. The walls have been lime plastered inside and out by Rachel and a team of dedicated volunteers.

All Rachel's hard work has now paid off. Penwhilwr was the winner of the TV series Grand Design Eco House 2008. She also continues to run courses in eco-building, planning, yoga and meditation. She can be contacted via her email quietearth@ukonline.co.uk



THE RENEWABLE ENERGY SYSTEMS AT PENWHILWR



2 x Gasokol TecSol (S) flat plate solar collectors (4m²), connected to a twin coil copper hot water cylinder with a 12 volt electronic solar controller.

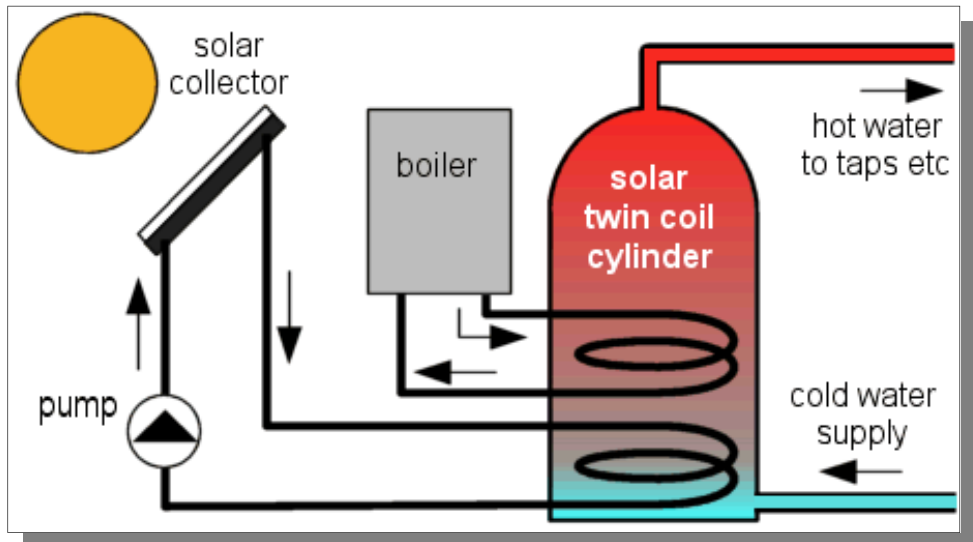
24v 1kw wind turbine installed by friends

500 w Kyocera Solar PV

HOW SOLAR THERMAL PANELS WORK

Solar water heating systems use heat from the sun and usually work alongside a conventional water heater. The technology is well developed with a large choice of equipment to suit many applications.

Solar water heating systems can provide most hot water needed during the summer months and about 50% year round. The average domestic system reduces carbon dioxide emissions by around 400kg per year, depending on the fuel replaced.



For domestic hot water there are three main components: solar panels, a heat transfer system, and a hot water cylinder. Solar panels - or collectors - are fitted to the roof. They collect heat from the sun's radiation. The heat transfer system uses the collected heat to heat water. A hot water cylinder stores the hot water that is heated during the day and supplies it for later use. A southeast to southwest facing roof is needed receiving direct sunlight for the main part of the day.

CONTACTS

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