Renewable energy case studies

Case study 5

Ground source heat pumps

Dr Lawn's new all timber house where he installed a ground source heat pump and a solar water heating system with the help of an Energy Saving Trust grant.

Summary

When Dr Lawn decided to build a three bedroom house he wanted to make its energy supply as sustainable as possible. He had been interested in the conservation of energy for many years and felt that wasting raw materials on heating was unnecessary when so many renewable energy sources were available. Having seen heat pumps working in America he was very impressed with what they could do, so when the opportunity arose to replace an old house with a new build he looked into the possibility of using a ground source heat pump.

Dr Lawn's installer and architect worked together closely to ensure that his new house was designed to maximise the efficiency of the heat pump. As heat pumps run at a lower temperature than normal central heating systems, he was advised that the foundations should be made of concrete, and that he would need under floor heating combined with the right insulation in the walls, floors and loft. To maximise savings further, the windows were positioned to absorb passive heat from the sun into the house and a solar water heating system, also funded by the Energy Saving Trust, was installed.

The location of Dr Lawn's home was ideal for a ground source heat pump as he has plenty of ground space which allowed him to dig horizontal trenches for the ground loops. However, the installation process took longer than expected because large rocks were discovered when the trenches were being dug. This also increased the cost of the installation by several thousand pounds, making it more expensive than a normal system of this size.

Dr Lawn is very proud that his house will use considerably less energy than it would have done without the heat pump and solar panels. Although the capital costs of installing a heat pump are quite high he thinks the environmental benefits make it a worthwhile and sensible investment.

Key points

- Heat output: 10kW
- Type of ground loop: horizontal 'slinky'
- Electrical input to power heat pump: 2.5kW
- Proportion of heating met by heat pump: 100 per cent
- Fuel being replaced: electricity
- Estimated fuel savings: approximately £460/yr
- Estimated carbon savings: approximately 7,000kg CO_2/yr

Cost

Total installation cost: £13,942
Energy Saving Trust grant: £3,823

Further information

In Scotland, the Energy Saving Trust (with funding from the Scottish Executive) offers homeowners grants of 30 per cent towards the cost of a renewable energy installation, up to a maximum of £4,000. Technologies eligible for funding include, but are not limited to, solar water and space heating, wind, hydro, heat pumps and automated wood fuelled boilers and stoves.

To obtain an application pack and further information contact the helpline on **0800 138 8858** or visit **www.est.org.uk/schri.**

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