Energy-efficient house

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1 Work in pairs and discuss these questions.

1 What renewable energy sources can you think of?

2 Which are suitable for domestic use?

3 Why do people use them?

4 Do you use any renewable energy sources in your home? What about other people in your country?

5 What do you predict for the future?

2 Read these texts about four renewable energy technologies in the UK. Which do you think is the best idea? Why?

Glossary: carbon saving* = the amount of carbon that is not used (thus reducing carbon emissions and global warming).

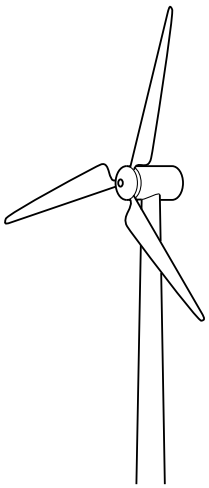
CO_2 = carbon dioxide

3 Read the texts again and make notes under the following headings: initial cost, how it works, energy saved annually and the environmental benefit.

4 Work with a partner. You are building a new house and have been given a special grant of £12,000 to spend on renewable energy sources. Discuss which of the renewable energy technologies you will invest in.

5 Explain your choices to another pair.

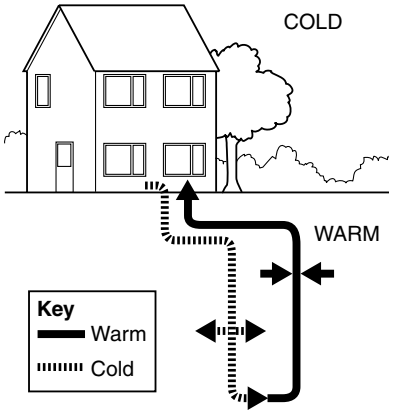
Wind turbines



Wind speeds of 20kph or more are needed for this technology to be effective. Small turbines are 1.75m in diameter and supply 1kW of power. Large turbines are 2m in diameter and generate 1.5kW worth of electricity. They generate 35% / 70% of your electricity needs. The cost? £1,500 for the small turbine, £4,500 for the large, but government grants are available of £500 and £1,500 respectively. The CO_2 saving* for small turbines is 15% and for large ones 30%.

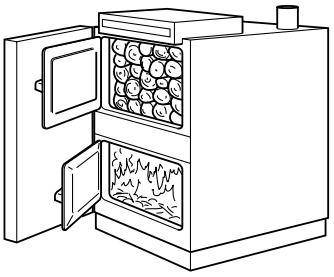
Ground source heat pumps

This technology draws heat from the ground, which is piped underground to your home. This can supply under-floor heating or power radiators. You need power to run the system, and you get 4 units of power for every 1 unit of input. A 10kW unit should save all the gas you would have used, but depending on your electricity use the annual energy saved is variable. The initial cost is in the region of £10,000, with government grants of £1,200 on offer. The annual carbon saving* is around 33%.



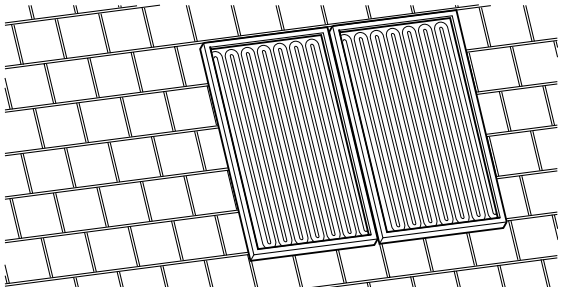
Wood-burning boilers

Like gas boilers, wood-burning boilers burn carbon-based fuel, but because trees absorb carbon, they are carbon-neutral. They cost more to run than gas, so there is no annual saving, and the initial investment will be at least £5,000. Government grants are available of up to £1,500. They heat both your house and your water and should save you all the money you spend on gas. These boilers effectively save nearly 70% of your annual CO_2 emissions.



Solar water heaters

Solar panels are a familiar sight, particularly in hotter countries. Essentially they heat water which is piped round the house. Technology has been improving over the past few years and you should expect to pay about £2,500 for a medium-sized system. A government grant of £500 is currently available and you should expect to save around 8% on your heating bill. The annual carbon saving* is also 8%.



ENERGY-EFFICIENT HOUSE

Lead-in

Ask: What do we mean by energy-efficient? Elicit examples of energy-efficient equipment.

Procedure

1 Students work in pairs and discuss the questions. Elicit feedback from the pairs in a brief whole class discussion.

2 Check students understand what 'carbon saving' means. Ask them to read the texts and decide which they think is the best idea and why.

3 Students read the texts again and make notes under the headings.

4 Students work in pairs to come to an agreement. Pairs then compare their answers. Discuss the choices with the whole class.

Answers

1 Possible renewable energy sources include wind, wave and solar power. All those mentioned in the text are suitable for domestic use.

2 People use them to save money, protect the environment or to be fashionable.

Vocabulary

renewable energy, CO2 (carbon dioxide), solar panel, carbon-neutral, boiler, turbine, generate.