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Sheet 10 Wind Turbines

Wind turbines generate electricity from wind. Aerodynamic blades are turned through the force of wind, driving a rotor that creates electricity. The stronger the wind, the more electricity is generated.

How it works

Wind turbines use large blades to catch wind. When the wind blows, the blades rotate causing direct current (DC) electricity to be generated. This is then converted into alternating current (AC) using an inverter to power the appliances in your home.

There are two types of domestic-sized wind turbines:

Pole-mounted: These are free standing and are erected in a suitably exposed position, capable of generating about 5-6kW.

Building-mounted: These systems are smaller, often about 1-2 kW in size, and can be installed on the roof of a home.

Bladeless wind generators, which technically aren't turbines, are a new type of technology that's gaining attention. These work by a phenomenon called 'vortex shedding'. They rely on harnessing the 'wobbly-ness' of the structure to create electricity via an alternator.

Very few domestic sites are suitable for traditional turbines. Suitability should be determined by a year-long survey of wind speeds and directions.

Costs and savings

The cost of a wind turbine system varies depending on the size and mounting method.

Building-mounted systems are less expensive, but also produce less electricity. A 6kW pole-mounted wind turbine can cost between £23,000 and £34,000 to install.

Wind turbines need routine maintenance checks every 2-3 years, which cost about £100-200, depending on the type and size of the system.

Wind turbines can last up to 20 years, but the inverter may need replacing before then. Expect to pay £1,000-2,000 for an inverter.

Financial incentives, such as the Smart Export Guarantee tariffs, could help offset the initial cost of the system.

Key considerations

- **Wind speed.** Choose a location that sees the most wind and one without obstructions.
- **Height.** Determine how high you can erect the turbine, since the higher it is, the more efficient it will be.
- **Permission.** In some cases, you may not need planning permission, but in those instances, you will need to meet strict criteria.

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