

Wind Power

Wind turbines produce electricity by harnessing the wind's energy. The wind causes a turbine's blades to rotate, which turn a generator inside the turbine. The generator uses this turning energy to produce electricity.

Wind turbines are expensive to build, but once they are up and running there are minimal costs as they require no fuel.



Facts and Stats

Cost of building 1 large turbine:	£3 million
Environmental impact:	Repays carbon footprint (building and installing) within 6 months, but disrupts wildlife and birds. Causes noise and sight pollution
Area taken up:	Even medium turbines can have blades that are around 48m long, and the turbines need to be properly spaced apart
Amount of kW produced per hour:	1,500

KW x Total hours in a year x capacity factor

Average amount of energy one house requires in a year

Advantages

- Provides zero-emission energy
- Pays back cost of installation in energy produced

Disadvantages

- Cannot guarantee consistent wind
- Maintenance costs can be high
- Provides nuisance for wildlife (especially birds) and causes sight pollution
- Needs lots of wide open space

Step 1 :

KW x total hours in a year x capacity factor

Average amount of energy one house requires in a year

Step 2 :

1500 x 8760 x 0.25

$$\frac{4664.7}{6.7} = 704.2 \text{ (1dp)}$$

Step 3 :

So one large turbine can provide energy to 704 homes in a year.

Step 4 :

How many turbines do we need to provide electricity to 250,000 homes?

Step 5 :

250,000

$$\frac{250,000}{704.2} = 355.0 \text{ Turbines (1dp)}$$

Step 6 :

Cost of 1 large turbine is £3 million

Cost of 355 = (3,000,000 x 355) = **£1,065,000,000**