


How do wind turbines generate electricity?

1. What is wind?

2. Why is wind an example of renewable energy?

3. Whilst you can't see the wind directly, you can see its effects! In the table below, make a list of some of the effects of a strong wind. One has been written for you.

	<p>Effects of a strong wind:</p> <ul style="list-style-type: none">• Leaves blowing off trees•••••
---	---

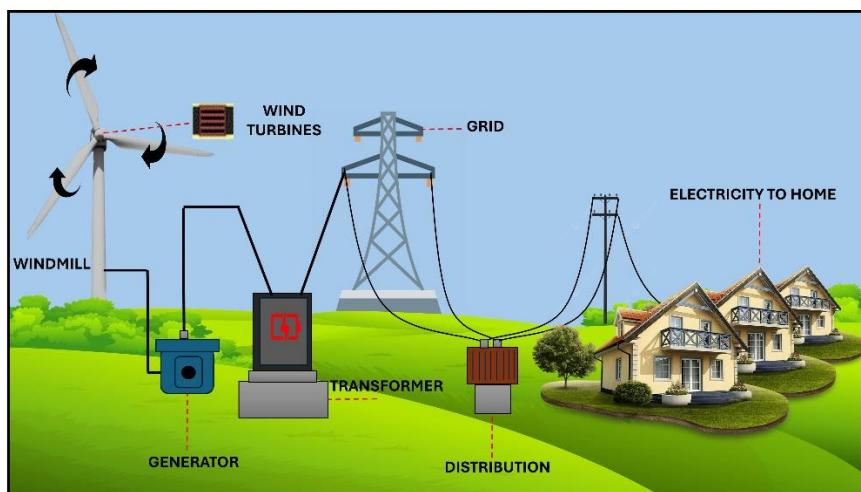
4. The diagram below shows how electricity generated by wind turbines reaches our homes.

(a) Write the following labels on the diagram.

- Wind turns the turbine's blades to create mechanical energy
- The generator converts mechanical energy into electrical energy
- Electricity is carried to a substation
- Electricity is transported by the national grid to homes and businesses

(b) Use arrows to show the direction of electricity movement from the turbines to the buildings.

(c) Label the electricity pylons.



5. In this activity, you will need a sheet of graph paper. You are going to compare the heights of wind turbines by drawing a diagram like the one below.

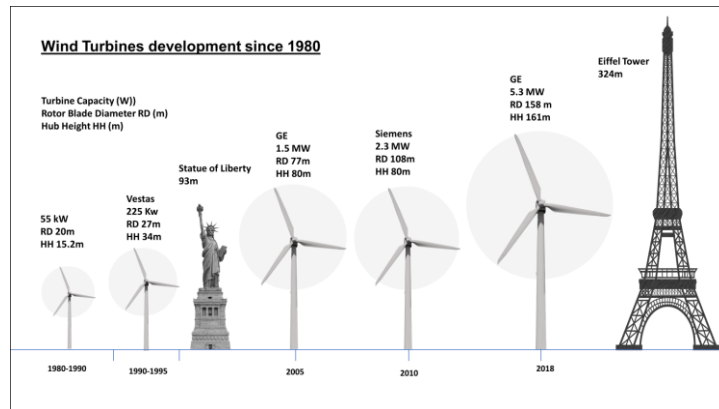


Image courtesy of Swati Sood, PhD candidate UWE

- Your vertical axis (height) needs to extend from 0m to 350m
- Draw a horizontal axis to represent ground level and dates from 1980 – 2020.
- Use the data in the table below to draw vertical lines to show the hub heights of wind turbines. Place these at the correct dates.
- Add simple sketches to show the heights of Charles Brush’s early wind turbine, the Swedish wooden turbine, the Statue of Liberty and the Eiffel Tower.

	Date	Height (m)
Wind turbine	1980-1990	15.2
	1990-1995	34
	2010	80
	2018	161
Charles Brush’s turbine (1888)		18
Swedish wooden turbine		105
Statue of Liberty		93
Eiffel Tower		324

[The wind turbine height values are for the hub, located at the top of the tower]

6. The map below shows the distribution of wind farms in the UK.
- (a) Are most onshore wind farms located in the north or south of the UK? _____
- (b) Describe the location of the UK’s offshore wind farms.

(c) Suggest why offshore wind farms tend to be larger than onshore wind farms.

Digest of United Kingdom Energy Statistics (DUKES) 2023

