How does an offshore wind farm work?

1. The force of the wind turns the **blades**.
2. The blades are attached to the nacelle through the **hub**.
3. The **low-speed shaft** spins at the same speed as the blades (7 - 12 turns per minute).
4. The **gearbox** increases this speed more than 100 times and transfers it to the high-speed shaft.
5. The **high-speed shaft** (+1,500 revolutions per minute) transmits this speed to the generator.*
6. The **generator** transforms the kinetic energy it receives into electricity.
7. The electricity produced by the generator is fed down through the inside of the **tower**.
8. The **converter** converts the direct current into alternating current.
9. The **transformer** raises the voltage (33 kV – 66 kV) in order to transport it across the wind farm.
10. The electricity is transmitted via **underwater cables** to the substation.
11. At the **substation**, the electricity is converted to high voltage current (+150 kV).
12. Electricity is transported through the **distribution network** until homes.

(*) Some technologies use low-speed generators coupled directly to the low-speed shaft.