

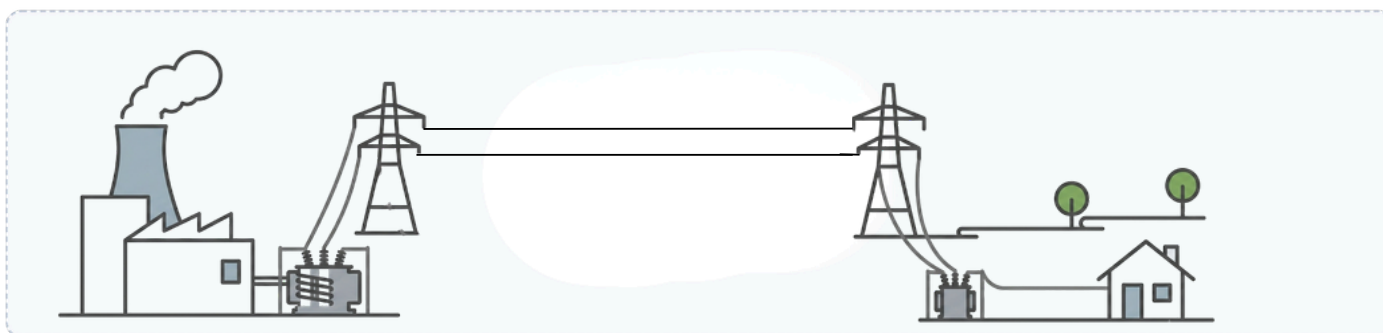
The National Grid

AQA GCSE Physics · Electricity

National Grid

The national grid is a circuit that connects producers and consumers of electricity.

The national grid — label the diagram



Voltage choices: **230 V** **25 000 V** **400 000 V**

Label the diagram with: **step-up transformer**, **step-down transformer**, and the **three voltages** (at the power station, in the transmission cables, and at homes).

Current at three parts of the grid [3 marks]

A power station transmits **9.2 MW** (9 200 000 W). Use $P = IV$, so $I = P \div V$, to find the current at each voltage.

Power station (25 000 V): $I =$ _____ A

Transmission cables (400 000 V): $I =$ _____ A

Homes (230 V): $I =$ _____ A (*split between all homes*)

Why step up?

A **step-up transformer** _____ the voltage. This _____ the current. A smaller current means less energy is _____ by heating up the surroundings (the cables).

Word bank: **increases** · **decreases** · **wasted**

Exam-style question [4 marks]

Electricity is transmitted across the country using the national grid at a potential difference of 400 000 V.

(a) Name the device used to increase the potential difference before transmission. [1 mark]

(b) Explain why electricity is transmitted at a high potential difference rather than a low one. [3 marks]

