

# WJEC (Eduqas) Physics GCSE

## 1.3: Energy Transfers

### Detailed Notes

(Content in **bold** is for higher tier **only**)

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## The National Grid

The National Grid is a system of **power lines** and **transformers** linking **power stations** to consumers across the UK. It allows electricity to be transferred for domestic use.

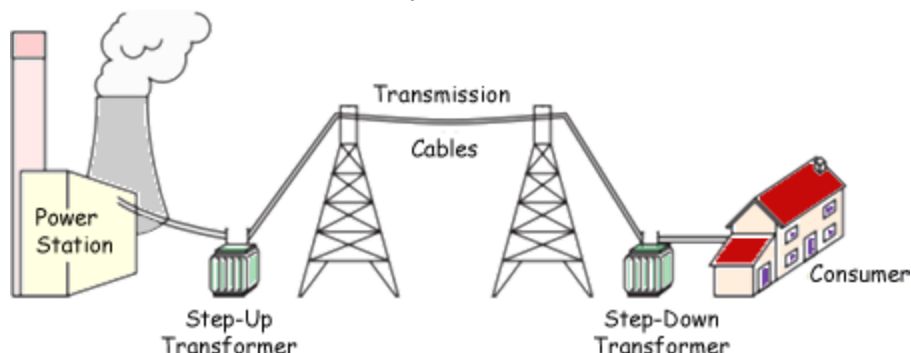
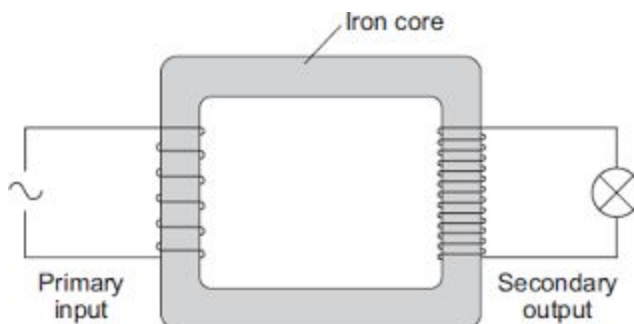


Diagram showing the components of The National Grid (cyberphysics.co.uk)

## Transformers

Power stations produce electricity at **25,000 V**. This power station voltage needs to be transformed to a **higher** power line voltage to **reduce the current** ( $P=IV$ ). Reducing the current will **reduce the amount of energy lost** through heat in the power lines. Step-up transformers can increase the voltage to up to **132,000 V**.

Step-down transformers then **reduce** the voltage back to a **safe level** ready for domestic use. Household electricity has a voltage around **230 V**.



For each different domestic device, energy is transferred from **batteries** or this **a.c. mains supply** to the motors or heating elements inside. **Efficiency** of this transfer can **vary** depending on the device and its **power rating**.

