

## Definitions and Concepts for OCR (B) Physics GCSE

### Topic 2: Sustainable Energy

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*Definitions in **bold** are for higher tier only*

*Definitions marked by '\*\*' are for separate sciences only*

**Alternating Current:** Current flow consisting of charges that continually change direction. These oscillations usually occur at a set frequency.

**Alternating Voltage:** A continually oscillating current flow, which results in the potential difference across two points continually oscillating between a positive and negative value.

**Biofuels:** A store of chemical energy that originates from living matter such as plants or animal waste. Biofuels can be burned in a power station as part of the process of generating electricity.

**Chemical Energy:** A store of energy found in things such as batteries, fuels and food.

**Closed System:** A system that experiences no net change in its total energy when energy transfers occur within it.

**Conduction:** The transfer of heat energy through the vibrations of particles in a medium.

**Conservation of Energy:** The law that energy can be transferred, stored or dissipated but never created or destroyed.

**Constant Temperature:** Bodies at a fixed temperature radiate the same average power that they absorb.

**Convection:** The transfer of heat energy through convection currents in a fluid.

**Direct Current:** Current flow consisting of charges flowing in a single direction only. Batteries and cells provide direct current.

**Direct Voltage:** A one-directional current flow, which results in a fixed voltage polarity.

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**Earth Wire:** The green and yellow striped safety wire connected to metal casings, that prevents an appliance from becoming live.

**Elastic Potential Energy:** The store of energy that stretched or compressed objects contain.

**Electrostatic Potential Energy:** The store of energy due to the relative position of a charge in an electric field.

**Fossil Fuels:** Coal, oil and gas. They act as stores of chemical energy, which is released as thermal energy when they are burned in power stations. They are non-renewable.

**Gravitational Potential Energy:** The store of energy that all raised matter has. It is directly proportional to the mass of the object, the distance that it is raised, and the gravitational field strength at that point.

**Heat Transfer:** The transfer of thermal energy from a hotter region to a cooler region, through conduction, convection or radiation.

**Hydroelectric Power:** Renewable energy generated by water stored at a height, and released through a turbine. The turbine turns a generator which converts the kinetic energy into electrical energy.

**Joule:** The unit used for energy. Equal to the work done when a force of one Newton acts over a distance of one metre.

**Kilowatt-Hour:** A unit of energy. It is often used in the context of domestic electricity due to the large energy transfers involved.

**Kilowatt:** A unit of power often used in relation to domestic power due to the large energy transfers that occur. One Kilowatt is equivalent to one thousand Watts.

**Kinetic Energy:** The store of energy that all moving matter has. It is directly proportional to the object's mass and to the square of its velocity.

**Live Wire:** The brown coloured wire that carries the alternating current from the supply in a mains power supply.

**Lubrication:** The application of a lubricant (such as oil) to reduce the friction that acts between surfaces. This may improve the efficiency of a system.

**Magnetic Energy:** The potential energy of a magnet.

**Mains Electricity:** An a.c supply, which in the UK has a frequency of 50Hz a value of 230V.



**Neutral Wire:** The blue coloured wire that completes the circuit in a mains power supply.

**Non-Renewable Energy Resource:** An energy resource that cannot be replenished whilst it is being used. It is a finite resource.

**Nuclear Energy:** The store of energy found in the nuclei of atoms.

**Nuclear Power:** Non-renewable energy that is generated from the energy stored in the nuclei of radioactive isotopes. It is released in processes known as nuclear fission and nuclear fusion.

**Power:** The rate at which energy is transferred, or the rate at which work is done. It is calculated by dividing the work done by the time taken.

**Power Cables:** Metal wires that are part of the National Grid. Electricity is transported along them at very high voltages to reduce the energy loss and make the transportation more efficient.

**Power-Rating:** The maximum rate of energy transfer of an appliance.

**Radiation:** The transfer of energy, without the transfer of matter. No medium is needed for radiation to occur.

**Renewable Energy Resource:** An energy resource that can be replenished whilst it is being used.

**Sankey Diagram:** A diagram used to show the energy transfers of a system.

**Solar Power:** Renewable energy generated by converting the energy of the sun into electrical energy, usually by using a solar panel.

**Surface Temperature:** The temperature of a body is determined by the rate at which they absorb and emit radiation.

**Step-Down Transformer:** A device used to decrease the voltage of the power transported by power lines to safe levels before it is used for domestic purposes.

**Step-Up Transformer:** A device used to increase the voltage of a power supply before it is transported along power cables.

**Thermal Energy:** The store of energy that all objects with a temperature contain. The higher the temperature, the greater its thermal energy store.

**Thermal Conductivity:** A measure of how good a material is at conducting heat. The higher this value is for a given material, the higher the material's rate of energy transfer via conduction will be.



**Thermal Insulation:** The addition of a material that reduces the amount of heat that is transferred from a system to its surroundings.

**Useful Energy Transfer:** The transfer of energy by a system, to directly serve the purpose of the system.

**Waste Energy Transfer:** The transfer of energy by a system to a form that doesn't directly serve the purpose of the system.

**Wave Power:** Renewable energy generated by converting the kinetic energy of waves into electrical energy.

**Work Done:** Work is done on an object when a force causes it to move through a distance. It is equal to the product of the distance travelled and the magnitude of the force in the direction of motion.

