Your notes

GCSE Design and Technology: revision notes

Energy generation and storage

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Fossil fuels and nuclear power

- **Fossil fuels** (coal, oil and natural gas) are burned to heat water into steam, which turns turbines connected to generators.
- They are reliable and can meet demand at any time, but they are finite (**non-renewable**) and release carbon dioxide, which contributes to climate change.
- Nuclear power uses the heat from **nuclear fission** to make steam. It produces no carbon dioxide while running and is reliable, but the waste stays dangerous for thousands of years and power stations are costly to build and close down.

Renewable energy

- Wind: turbines turn in the wind. Clean, but they only work when it's windy and some people think they spoil the landscape.
- Solar: **photovoltaic cells** turn sunlight into electricity. Clean, but they depend on sunshine and need large areas.
- Tidal and wave power use the movement of the sea. Reliable and predictable (tides), but costly and can affect wildlife.
- Hydroelectric power uses water flowing from a dam. Reliable, but dams flood valleys and damage habitats.
- **Biomass** burns plant material or waste. It is renewable, but it releases carbon dioxide when burned.

Storing energy

- **Pumped storage**: when demand is low, water is pumped up to a high reservoir; when demand is high, it flows down through turbines.
- Batteries store chemical energy. Alkaline batteries are single-use and cheap; rechargeable batteries cost more but can be reused many times, reducing waste.
- Kinetic energy storage systems, such as flywheels, store energy as movement.

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Key terms

Fossil fuel	A finite fuel made from ancient plants and animals, such as coal, oil or gas.
Renewable energy	Energy from a source that won't run out, such as wind or solar power.
Non-renewable	A resource that will run out.
Nuclear fission	Splitting atoms to release heat energy.
Photovoltaic cell	A cell that turns sunlight into electricity.
Pumped storage	Storing energy by pumping water up to a high reservoir.
Biomass	Plant or animal material burned to release energy.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which of these is a renewable energy source?
2. What is a disadvantage of fossil fuels?
3. What is a disadvantage of nuclear power?
4. What does a photovoltaic cell do?
5. What is a disadvantage of solar power?
6. How does pumped storage store energy?
7. What is an advantage of rechargeable batteries over alkaline batteries?
8. What is an advantage of tidal power?

Answers

1. Wind power
2. They release carbon dioxide and will run out
3. Its waste stays dangerous for thousands of years
4. Turns sunlight into electricity
5. It depends on sunshine
6. By pumping water uphill when demand is low
7. They can be reused many times
8. Tides are predictable

What to do next

Practise 11 questions on this topic

Try 5 exam questions, with mark schemes

Read the lesson, one step at a time

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