

# Design & Technology

## AQA GCSE

# Renewable energy

### Materials required for questions

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- Pencil
- Rubber
- Calculator

### Instructions

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- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

### Advice

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- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

# Good luck!

**Q1.** What type of renewable energy is shown in the picture below?



- A** Solar
- B** Biomass
- C** Thermal

**Q2.** What type of renewable energy is shown in the picture below?



- A** Wind
- B** Biomass
- C** Hydroelectric

**Q3.** Which one of the following is a renewable resource?

- A** Natural gas
- B** Oil
- C** Water

**Q4.** What is a key disadvantage of solar power?

- A** It produces radioactive waste
- B** It cannot generate large amounts of electricity
- C** It only works during daylight hours

**Q5.** What is the main advantage of hydroelectric power?

- A** It has no environmental impact
- B** It can provide continuous, reliable energy
- C** It is the cheapest renewable to install

**Q6.** Why might biomass energy be considered carbon-neutral?

- A** The CO<sub>2</sub> emitted is offset by plants' CO<sub>2</sub> absorption
- B** It stores carbon underground
- C** It releases no CO<sub>2</sub> when burned

**Q7.** Explain how solar power and wind power generate electricity, and give one limitation of each **(4 marks)**

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**Q8.** Compare hydroelectric power and tidal power as renewable energy sources, listing one advantage and one disadvantage of each **(4 marks)**

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## Answers

**Q1.** A

**Q2.** A

**Q3.** C

**Q4.** C

**Q5.** B

**Q6.** A

**Q7.**

Mark Scheme:

Solar power explanation (1 mark):

- Photovoltaic (PV) cells convert sunlight directly into electricity OR
- Concentrated solar power (CSP) uses mirrors to heat fluid, producing steam to drive turbines.

Wind power explanation (1 mark):

- Wind turns turbine blades, which spin a generator to produce electricity.

Solar limitation (1 mark):

- Only works during daylight hours / cloudy weather reduces efficiency / requires large land area.

Wind limitation (1 mark):

- Unreliable in low-wind conditions / noise and visual pollution / potential harm to birds.

**Q8.**

**Hydroelectric advantage (1 mark):**

- Provides reliable, continuous power / large-scale energy storage possible / low operating costs.

**Hydroelectric disadvantage (1 mark):**

- Flooding land destroys habitats / high construction costs / droughts affect output.

**Tidal advantage (1 mark):**

- Predictable energy source (follows moon cycles) / long lifespan / low greenhouse gas emissions.

**Tidal disadvantage (1 mark):**

- High upfront costs / limited suitable locations / potential impact on marine ecosystems.

