

Energy Resources Efficiency

GCSE Physics · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Give one advantage and one disadvantage of generating electricity using hydroelectric power. (2 marks)

Step 1 · Advantage

Renewable; no carbon dioxide while running; reliable; can be turned on quickly to meet a rise in demand (any one).

Step 2 · Disadvantage

Building the dam floods land, destroying habitats and sometimes homes; few suitable sites; high building cost (any one).

Answer: e.g. reliable and quick to start; floods valleys

Check: Make each point specific to this resource, not just 'it is bad for the environment'.

2. Now try one with the steps

Use the example energy mix table to calculate the percentage of electricity that came from renewable resources. (2 marks)

Step 1 · Pick out the renewables

Step 2 · Add them

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Define a renewable energy resource. [1]

2. Name three renewable energy resources. [3]

3. Name three non-renewable energy resources. [3]
-
-
-
-
4. State two main uses of energy resources. [2]
-
-
5. Give one advantage and one disadvantage of using wind turbines to generate electricity. [2]
-
-
6. Explain why solar power is less reliable than a gas-fired power station. [2]
-
-
7. Explain why nuclear power produces no carbon dioxide while running but still has environmental issues. [2]
-
-
8. Use the example energy mix table to calculate the total percentage of electricity from non-renewable sources (gas, nuclear and coal). [2]
-
-
9. Explain why biofuels can be described neutral. [2]
-
-
10. A wind farm has 40 turbines, each with a maximum output of 2.5 MW. Calculate the maximum total output in MW. [1]
-
-
11. Calculate how many 3.0 MW wind turbines would be needed to match a 1200 MW power station, if every turbine ran at its maximum output. [2]
-
-
12. Suggest why a country with many wind farms still keeps some gas power stations. [2]
-
-

13. Explain two reasons why the use of coal to generate electricity in the UK has fallen sharply. [2]

14. Evaluate the use of a tidal barrage compared with a wind farm for generating electricity. [4]

4. Before you hand it in

"Renewable means it does not pollute."

Renewable means it will not run out. Biofuels are renewable but still release carbon dioxide and other gases when burned.

Counting nuclear power

Nuclear fuel (uranium) is mined and will run out, so it is non-renewable, even though it is low-carbon.

"Wind power is bad for the environment."

Be specific: turbines can be noisy and change the look of the landscape; they can harm birds; building them uses resources.

Answering 'evaluate' with only advantages

Give points for and against, then a conclusion that follows from the points you made.