

P1 – Energy Quiz

1. What is a renewable energy source?

An energy source that is replaced faster than it can be used.

2. Give examples of renewable energy sources.

Wind, waves, tides, hydroelectric, biofuel, geothermal, solar

3. How does the step-up transformer increase the efficiency of the National Grid?

It increases the voltage and decreases the current, therefore reducing energy loss along the cables.

4. Explain one effect burning fossil fuels has on the environment.

Produces greenhouse gases, nitrogen oxides (trigger asthma attacks), sulphur dioxide (leads to acid rain)

5. Pumped storage hydroelectric power stations have a short start-up time. Why is this important?

To meet surges in demand/ start generating electricity in a short time

6. Give an advantage of a pumped storage hydroelectric power station.

Can store energy for later use/ renewable

7. Using mainly wind turbines to supply electricity might cause fluctuations in the electricity supply. Why?

Wind speeds fluctuate so turbines don't generate electricity at a constant rate

8. Between 2002 and 2008 the amount of electricity used in the UK decreased. Suggest why.

Energy efficient lighting used/ developed; increase in energy costs so people switch off more; 'switch off' campaign raises awareness of environment

9. Although gas boilers are very efficient, some energy is wasted. What happens to this waste energy?

It is transferred to the surroundings, becomes spread out; wasted as sound

10. Give a disadvantage of a large scale hydroelectric power station.

Large areas of land flooded, homes and habitats destroyed

11. What is the National Grid?

System of cables and transformers

12. Why is transferring electricity directly to local homes more efficient than using the National Grid?

Less energy is wasted as the cables used are shorter

13. A solar cell can be used to recharge a mobile phone. Suggest and explain one factor that would affect the charging time.

Time of day, position of solar cell, angle of solar cell towards Sun, latitude, cloud cover, dust; all cause a change in light intensity

14. What are the advantages of using solar cells instead of fossil fuel power stations to generate electricity?

No air pollution, free resource, renewable, usable in remote areas, no need to connect to National Grid

15. Fitting a new hot water boiler costs £1800 but saves £200 per year. What is the payback time?

9 years

16. Explain why using an energy efficient light bulb rather than an ordinary light bulb reduces carbon dioxide emissions.

Less electricity needs to be generated from power stations, less fossil fuel needs to be burnt

17. Give two advantages of burning wood instead of coal.

Carbon neutral, renewable, conserves fossil fuel reserves

18. Why do wood burning stoves have a large surface area?

To increase the rate of energy transfer

19. Do you agree with the statement that 'replacing old freezers with more energy efficient freezers' benefits the environment?

Yes - less fossil fuels burnt as less electricity needed, so fewer greenhouse gases emitted
No- old freezers must be dumped and there are hazardous chemicals inside them

20. How do you reduce energy loss from the loft/ roof?

Fibreglass

21. How do you reduce energy loss from the walls?

Cavity wall insulation such as polystyrene beads

22. How do you reduce energy loss from windows?

Double/ triple glazing

23. How do you reduce energy loss from doors?

Draught excluders

24. Why are electricity companies selling electricity at night at a lower rate?

Supply exceeds demand

25. Leaving a 1kW radiator switched on for the same length of time as a 40W lamp is worse for the environment. Why?

Radiator uses more energy, more electricity is needed, more fossil fuel is burnt, more CO₂ produced

26. What is meant by the word efficient?

Most input energy is usefully transformed

27. Give examples of stored energy.

Gravitational, elastic, chemical

28. Why must the total energy input equal the total energy output?

Energy cannot be created or destroyed

29. Name the useful and wasted energy output from a hair dryer.

Useful thermal and kinetic and wasted sound energy

30. Name the useful and wasted energy output from a TV.

Useful sound and light, wasted thermal

31. What does it mean to decommission a nuclear power station?

Remove radioactive waste/ fuel- very expensive process

32. How could companies reduce CO₂ emissions?

Use more nuclear power, use more renewable energy sources, and use carbon capture technology

33. Give the advantages of using nuclear power.

Little fuel needed for a large amount of energy released (concentrated source of energy),
Continuous process, no greenhouse gas emissions

34. Give advantages and disadvantages of tidal power generating systems.

Renewable, calms coastal waters, low running costs, no air pollution but high installation costs, time dependent, disturbs coastal habitats

35. Give advantages and disadvantages of wind power.

Renewable, no air pollution, leave land undamaged when removed but unsightly and noisy, require large areas of land as many turbines are needed