



Power Up Quiz

Every aspect of our lives whether at home, work, taking part in leisure pursuits is dependent on energy. Imagine a day if you had no electricity, fuel or gas and think how this would disrupt our lives!

Ring or Underline Your Answers

1) Which school subjects do you think would be useful in careers related to the energy industry?

2) The UK is dependent on its 120 plus power stations across the country to generate electricity. Which of the following fuels are used as the main source of energy production in UK power stations? Chose two from the following which you feel are the biggest source of energy

a) Oil b) Gas c) Coal d) Nuclear e) Tidal f) Wind g) Solar Wind

3) Which of the following do you think are regarded as 'renewable' or green energy?

a) Wind b) Coal c) Solar d) Gas e) Oil f) Nuclear g) Hydro electric h) Tidal

4) Can you name five major employers in the energy industry?

5) What is the difference between renewable and other forms of energy?

6) Which of these fuels is the cheapest to use in the production of electricity?

a) Coal b) Nuclear c) Renewable Energy

7) There are increasing concerns about pollution, the environment and carbon emissions. Which one of these sectors do you think produces highest percentage of carbon emissions in the UK? Is it:

a) Energy generation (power stations)
b) Transport (cars, buses, trains, aircraft etc)
c) Industry and business (chemical plants, steel works, oil refineries, shops, offices etc)
d) Homes and communities (our houses and flats)
e) Farming, Land Use and Waste

8) Have you heard of the term - Carbon Capture and Storage?

What do you think it means? Why is it being linked to plans for new coal fired power stations?

9) Which of these countries produce the most amount of oil?

a) Britain b) USA c) Canada d) Saudi Arabia e) Iran f) Norway g) Kuwait

10) In which part of the world is there the largest known source of oil reserves?

- a) Africa b) North America c) Middle East d) Russia e) Western Europe

11) Can you list any products that can be made from oil?

12) The UK is increasingly having to import gas as North Sea reserves run out. (Gas is a very important source of fuel, being heavily used in power stations and in homes for heating and cooking).

How much gas do you think we import in 2010?

- a) 10% b) 20 % c) 30% d) 40% e) 50%

By 2020 how much are we likely to import?

- a) 40% b) 60% c) 80 % d) 100%

13) Britain is planning to increase its production of 'green' or renewable energy from around 6% to how much by the year 2020?

- a) 10% b) 15% c) 20% d) 30%

14) Name some of the new jobs associated with renewable energy?

15) Nuclear power accounts for 8% of the UK's electricity in 2010.

By 2020 how much does the Government plan this to be?

- c) 0% b) 5% c) 8% d)10% e)13% f) 20 %

16) Can you think of ways the UK could increase its use of green technology?

17) How could the UK reduce its carbon emissions?

18) Electricity generation and building new power stations is very expensive.

How much do you think it was suggested that the UK would need to spend by 2020 on building a secure, environmentally friendly power energy network?

- a) £1 million b) £100 million c) £ 500 million d) £1,000 million e) £2,000 million b) ship's navigation

For more information on careers and jobs in the Power Up Zone go to the Future Morph website on www.futuremorph.org and the Jobs4U website on www.connexions-direct.com/jobs4u Also check out www.mathscareers.org.uk and www.tomorrowsengineers.org.uk



Power Up Quiz; Answers

1) Which school subjects do you think would be useful in careers related to the energy industry?

Mathematics, Physics, Chemistry, Geography, Environmental Science, Biology

2) The UK is dependent on its 120 plus power stations across the country to generate electricity. Which of the following fuels are used as the main source of energy produce electricity in UK power stations? Chose two from the following which you feel are the biggest source of energy

a) Oil **b) Gas** **c) Coal** d) Nuclear e) Tidal f) Wind g) Solar Wind

Currently Gas and Coal combined contribute over 70% of the energy in power stations, well above Nuclear, Oil and all renewable sources like wind and solar.

3) Which of the following do you think are regarded as 'renewable ' or green energy?

a) Wind b) Coal **c) Solar** d) Gas e) Oil f) Nuclear **g) Hydro electric** h) Tidal

While nuclear energy produces much less carbon dioxide than coal, gas or oil it is normally not regarded as a renewable energy source.

4) Can you name five major employers in the energy industry?

EDF Energy, Shell, Sellafield, EON, National Grid

5) What is the difference between renewable and other forms of energy?

Non renewable sources of energy like coal, gas and oil will eventually either run out, coal seams exhausted or oil, gas reservoirs become so depleted drilling becomes uneconomic. Renewable sources are dependent on the Sun, wind or tides etc.

6) Which of these fuels is the cheapest to use in the production of electricity?

a) Coal b) Nuclear c) Renewable Energy

Coal is the cheapest to mine and run, however it is the most polluting with high levels of sulphur as well as carbon emissions and other chemical products.

The European Union has passed legislation which makes it illegal for the UK to continue to run many of its coal and oil based electricity power stations after 2016 on environmental grounds. However switching to green energy or building more nuclear plants will be more expensive and result in higher energy bills in the longer term.

7) There are increasing concerns about pollution, the environment and carbon emissions. Which one of these sectors do you think produces highest percentage of carbon emissions in the UK? Is it:

- a) Energy generation (power stations)**, or
- b) Transport (cars, buses, trains, aircraft etc)
- c) Industry and business (chemical plants, steel works, oil refineries, shops, offices etc)
- d) Homes and communities (our houses and flats)
- e) Farming, Land Use and Waste

Energy generation e.g. power stations is estimated to contribute 35% of carbon emissions. Transport and business/ industry are around 20%, with homes at 13% followed by agriculture, land and waste disposal on 11%.

8) Have you heard of the term - Carbon Capture and Storage? What do you think it means? Why is it being linked to plans for new coal fired power stations?

This where the by products from power stations are captured in a series of pipes and then fed thousands of feet underground into brine lakes or former gas reservoirs in the North Sea. This will replace the cooling towers attached to current power stations.

Coal fire power stations are the most polluting of all energy producers and many countries like the USA are actively looking at this technology to reduce emissions.

China, USA and Australia are heavy users of coal fired power stations.

In 1990 coal made up 67% of the UK's electricity supply before there was a turning to gas.

9) Which of these countries produce the most amount of oil?

- a) Britain b) USA c) Canada **d) Saudi Arabia** e) Iran f) Norway g) Kuwait

Saudi Arabia is the world's largest producer of oil, in contrast the UK is seeing its production of oil from the North Sea decline substantially making the country increasingly dependent on importing oil from abroad.

10) In which part of the world is there the largest known source of oil reserves?

- a) Africa b) North America **c) Middle East** d) Russia e) Western Europe

The International Energy Agency estimated in 2010 that around 60% of known oil are in the Middle East. This led by Saudi Arabia, followed by Iran, Iraq, Kuwait and the UEA United Arab Emirates. Other countries with large oil reserves includes Canada (mainly tar sands or shale oil which requires huge amounts of water to extract) and Venezuela. The country which uses the most oil, the USA has seen its reserves shrink rapidly and is now a major importer.

11) Can you list any products that can be made from oil?

This includes petroleum, kerosene (aviation fuel), diesel, heating oil, paraffin through to plastics, tar, white spirit, asphalt, solvents, pesticides and fertilisers used in agriculture. Oil underpins the whole of our transport industry from cars, vans, lorries to aviation. It is heavily used in agriculture as fertilisers and pesticides, in the production of plastics as well as in many pharmaceutical products.

12) The UK is increasingly having to import gas as North Sea reserves run out. (Gas is a very important source of fuel, being heavily used in power stations and in homes for heating and cooking).

How much gas do you think we import in 2010?

- a) 10% b) 20 % c) 30% **d) 40%** e) 50%

This is currently around 39%, up from only 2% in 2000.

By 2020 how much are we likely to import?

- a) 40% b) 60% **c) 80 %** d) 100%

This is the estimation in ten years time, showing the depletion of North Sea reserves and output. Main sources of UK gas imports come from Norway, Russia, countries in North Africa like Algeria, as well as Liquefied Natural Gas (LNG) from countries like Qatar. LNG has to be cooled to minus 163 degrees Centigrade and then shipped in specially built tankers to terminals at harbours like Milford Haven in Pembrokeshire, Wales or Canvey Island in Essex. Russia has the largest reserves of gas, followed by Iran.

13) Britain is planning to increase its production of 'green' or renewable energy from around 6% to how much by the year 2020?

- a) 10% b) 15% c) 20% **d) 30%**

This is a very challenging target laid down in the UK Low Carbon Transition Plan 2009. By 2020 it is hoped that over 40 % of energy will come from low emission sources which will include nuclear power and clean coal (using Carbon Capture and Storage technology).

14) Name some of the new jobs associated with renewable energy?

Energy analyst, Wave Energy Consultant, Sustainability Consultant, Water Specialist, Climate Change Consultant, Ecologist, Design Engineer (Solar Panels).

15) Nuclear power accounts for 8% of the UK's electricity in 2010.

By 2020 how much does the Government plan this to be?

- c) 0% b) 5% c) 8% d)10% **e) 13%** f) 20 %

While older nuclear power plants are now being closed down, there are plans to build a number of new nuclear plants.

16) Can you think of ways the UK could increase its use of green technology?

Building more wind turbines and wind farms - plans for 6,000 on land and 3,000 off shore; solar panels; solar cells; micro generation of electricity; hydro - electric dams (Glencoe Dam, Scotland); Tidal Barrier - plan for a major scheme in the Severn Estuary; wave power (schemes planned in the Orkneys and off Cornwall) etc

17) How could the UK reduce its carbon emissions?

There are increasing Government targets and tougher legislation across the economy to reduce carbon emissions. The major emphasis at present is on the power sector and with heavy industry. The transport sector is expected to reduce its output by 14%, homes and communities by 30%, farming and land management by 6%.

Vehicles are being designed to become more energy efficient with lower CO₂ emissions to developing electric cars and hybrids. In the longer term hydrogen vehicles using fuel cells are being developed. There are ideas like cutting back on domestic air travel and going by train, which is currently being upgraded with high speed schemes. European Union legislation requires an increased use of bio fuels to be added to petroleum and diesel supplies.

There is legislation to improve waste management - greater use of recycling to produce bio mass and schemes like anaerobic digestion rather than using land fill with its by product of methane. In the home, better insulation is being encouraged as well as smart meters, solar panels etc.

18) Electricity generation and building new power stations is very expensive.

How much do you think it was suggested that the UK would need to spend by 2020 on building a secure, environmentally friendly power energy network?

a) £1 million b) £100 million c) £ 500 million d) £1,000 million **e) £2,000 million** b) ship's navigation

The cost of renewing Britain's energy infrastructure is predicted to be a massive £200 thousand million. Uswitch.com, a price comparison website, puts this at £230 billion. How the money is to be raised in a culture of economic restraint following the Credit Crunch will focus Government and the energy companies for years to come.

Sources include UK Government's Low Carbon Transition Plan 2009
International Energy report 2009
OFGEM Report and uSwitch.com analysis February 2010