



Resource management

KEY TERMS

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|------------------|---|
| Biotic | A part of the environment that is living (or capable of reproduction) |
| Non renewable | This is a resource that, when used, can not be remade |
| Natural | Any feature or part of the environment that can be used to meet human needs |
| Renewable | This is a resource that is inexhaustible, and is naturally replenished |
| Abiotic | Part of the earths biosphere that is a non-living component |
| Carbon footprint | A measure of all the greenhouse gases an individual produces |

HUMAN EXPLOITATION OF ENVIRONMENTS

| | |
|----------------------------------|--|
| Causes of overfishing | Growing population means a greater demand for food and therefore for fish, The sale of fish can generate money, so more fish = more money for the fishermen. Improvements in technology means that more fish can be caught at one time. The ocean is generally an unregulated area, making fishing laws very weak and allowing overfishing to take place. |
| Impact of overfishing | Reducing the amount of fish means predators have less food, having a knock on effect on the food chain. A decline in fish stocks in one area, could then lead to exploitation of other areas of the sea/ocean. More extreme cases of overfishing could lead to the extinction of marine animals. As overfishing takes place, ships and boats pollute the water with oil and other chemicals. |
| Causes of fossil fuel extraction | Rapid industrialisation in countries increases means that significant amounts of energy are needed. Increasing wealth leads to greater demand for cars which require oil for fuel. Increased wealth leads to a greater demand to technology, which require energy. Globalisation has led to the growth in overseas travel, meaning oil is needed for fuel. |
| Impact of fossil fuel extraction | Wildlife habitats disrupted by the noise for vehicles and machinery. Wildlife habitats are removed by deforestation. Marine ecosystems are affected by oil spills at sea or on the land. Increased congestion in the area from lorries, machinery and containers vehicles. |
| Causes of deforestation | Increased demand for land for farming. Increased demand for timber/fuelwood due to a growing population. Clear of land for mineral extraction/mining/housing. Growth of illegal logging. Growing population/urbanisation. Road building. |
| Impact of deforestation | Reduced biodiversity. Producers killed, having knock on effects on food chains. Reduction in decaying leaves on the floor. Increased flooding due to lack of interception and increased surface run-off. Increased soil erosion because there is less protection from the trees. Increased global warming. Increased risk of drought. |

GLOBAL DISTRIBUTION OF NATURAL RESOURCES

The location of global **agriculture** and **forests** are very closely linked to the influence of latitude and climate. Areas with higher precipitation and hot/warm climates have large amounts of forests and agriculture. Areas with low precipitation levels create arid soils unsuitable to sustain plant life. The worlds **forests** are concentrated in specific locations, for example the location of rainforests (equator) and temperate forests (60° latitude). The location of the forests on a global scale is dictated by climate. Some **rare resources**, such as **gold** and **diamonds** are found in areas such as sub-Saharan Africa, Russia and Australia, but not in other continents. Large amount of **metals** are found within China, such as lead and zinc. **Fossil fuels**, such as oil and coal, are found all over the world. The largest reserves of oil are in Venezuela, Saudi Arabia and Canada. Global **water** supplies are very much dictated by climate. Areas with large annual amounts of precipitation have larger water supplies. Global water supplies are also very much dictated by levels of development. More developed countries have the ability to transfer and store large amounts of water.

UK DISTRIBUTION OF NATURAL RESOURCES

Across the UK there are a range of reservoirs spread out to ensure that there is a good supply of **clean water** throughout the country. Where rainfall levels are high. This is due to the west side of the UK receiving a much higher rainfall than the east. The distribution of **fertile soil** also determines the location of agriculture across the UK. With regards to **energy resources**, coal resources used to be found all over the UK, notably south Wales, Scotland and northern England, but coal resources are close to becoming exhausted. There are, however, still large oil and gas reserves under the North Sea. The UK also contains a range of **rocks and minerals**. Sedimentary rocks are generally found in the south east of England; metamorphic rock in central Wales, Scotland and some in the south west of England. Igneous rocks are generally found in Scotland, with some in north England. **Forests** dominate large areas of the UK, notably in Central Wales and the west coast of Scotland.

GLOBAL PATTERNS OF CONSUMPTION

| Food | Water | Energy |
|--|--|--|
| <p><i>The developed countries have the highest levels of food consumption due to:</i></p> <ul style="list-style-type: none"> - Higher affluence in the developed countries - The population tend to have a more wasteful attitude - Improvement in farming technology | <p><i>Developed countries have a much greater access to clean water due to:</i></p> <ul style="list-style-type: none"> - labour saving devices that require water (e.g. dishwasher and washing machines). - leisure activities, - advanced irrigation of crops. | <p><i>Developed countries have a much greater consumption for energy. Due to:</i></p> <ul style="list-style-type: none"> - As populations have more money they can afford to have energy using technology - Car ownership is growing |

RENEWABLE ENERGY

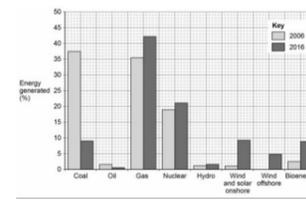
| Energy | Positive | Negative |
|--|--|--|
| Hydro-electric E.g. Three Gorges Dam, China | <ul style="list-style-type: none"> - Clean energy - creates a reliable water supply settlements - The reservoirs can be used for recreation | <ul style="list-style-type: none"> - destroy large areas of land - expensive to build - When built, this can stop the migration of fish |
| Wind e.g. Burbo Bank Liverpool | <ul style="list-style-type: none"> - can be placed out at sea, therefore reducing visual and noise pollution. - cheap to maintain. | <ul style="list-style-type: none"> - visually polluting and visually intrusive. - strong wind to work. - can kill migrating birds. |
| Solar e.g. Gobi Desert, China | <ul style="list-style-type: none"> - The running costs are very cheap, - The panels can be placed on houses. | <ul style="list-style-type: none"> - take up large areas of land. - visually polluting - Manufacturing the solar panels is expensive |

NON RENEWABLE ENERGY

| Energy | Positive impacts | Negative impact |
|------------------------------|---|--|
| Coal | <ul style="list-style-type: none"> - very efficient. - Mining is cheap and easy method, - 250 years of coal remain | <ul style="list-style-type: none"> - Greenhouse gases emitted - The open cast mines destroy ecosystems. |
| Oil north sea, UK | <ul style="list-style-type: none"> - The oil industry provides millions of jobs. - Oil is relatively easy to extract | <ul style="list-style-type: none"> - Broken pipelines often lead to spillages - greenhouse gases released. |
| Natural gas north sea, UK | <ul style="list-style-type: none"> - little effect when there is a leakage. - less carbon emissions than burning oil or coal. | <ul style="list-style-type: none"> - Harmful greenhouse gases are released - chemicals contaminate groundwater supplies. |
| Uranium USA | <ul style="list-style-type: none"> - Produces much less CO2 - it is relatively cheap to operate. | <ul style="list-style-type: none"> - The power stations are expensive to build The uranium used is very dangerous. |

UK ENERGY MIX

The UK energy mix refers to the different energy sources that are used to produce enough energy for the UK population. As can be seen on the graph, the main energy source for the UK is natural gas (approx. 42%), nuclear energy (approx. 21%), followed by coal, and renewable energy sources, and then coal.



REASONS FOR VARYING ENERGY MIX

Population size Some countries, particularly those that are developing or emerging, have a rapidly growing population size, such as India. **Government policy** Different pressure groups can put pressure on changes to government policy. The UK government is trying to meet the target of 15% of energy to be generated from renewables by 2020 **Location/availability of resources** The location of non-renewable energy resources will have a large impact on a country's energy mix. The geographical position of a country may provide it with opportunities for the development of renewable energy resources. **Economic/technological development** Some countries have to develop those resources that are the easiest/cheapest. Many of the more modern forms of non renewable energy require advanced technology to put in place, and an initial high cost. For example offshore wind turbines can cost up to £3 million each to put in place.

CHANGING GLOBAL DEMAND AND SUPPLY

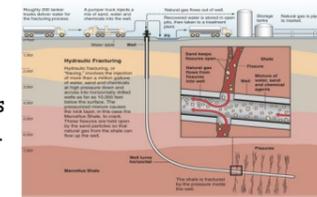
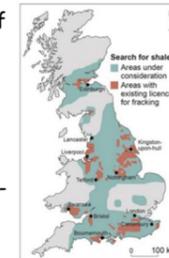
| Supply | Demand |
|--|--|
| Increased wealth — as affluence increases, the world is able to pay for the research, design and manufacture or a wide range of energy resources (e.g. nuclear power, solar power etc.). | Population growth — as there are more people, the demand for energy increases. 100 years ago there were approx. 2 billion people on earth; now there are over 7 billion. |
| Technological advancements — new technologies have opened up new types of energy sources, such as wind, solar and HEP. | Increased wealth — as affluence increases, people can afford more technology that requires energy (e.g. car ownership, central heating, TV). |
| Technological advancements — new technologies to discover and extract reserves of fossil fuels (e.g. fracking), means that oil, gas and coal has continued to dominate energy supplies. | Technological advancements — over the past 100 years there have been major advances in technology which requires energy (e.g. smartphones, TV's, hairdryers etc.). |

CHINA MANAGING ENERGY

The Three Gorges Dam cost \$30 billion to build and took 10 years to build. It led to the flooding of 600km² of land and forced 1.4 million displaced. The solar power station takes up 10km² of the Gobi desert and will produce enough energy to power 1 million homes. The Gansu wind farm consists of over 7000 wind turbines, but does produce the same amount of energy as a large nuclear power station

FRACKING

Advantages -Fracking will allow us to reach large amounts of previously inaccessible gas. -It will allow us to rely less on foreign imports of gas. -Thousands of jobs will be created. -There is minimal impact above ground as wells spread horizontally below ground from one above-ground site. -Reduces the cost of energy as it doesn't need to be imported. -Renewable energy sources do not currently meet the demand of energy needs. **Disadvantages**-Fracking uses vast amounts of water, causing conflicts within the local area. -There are concerns that fracking increases the number of earth tremors (earthquakes). -Fracking can cause land to move and homes to subside, lowering house prices -Fracking will continue our reliance on fossil fuels, preventing us from reducing CO2. -Chemicals used in the process could contaminate groundwater supplies. -Sites require numerous HGVs - this leads to congestion on narrow country roads and a decrease in local air quality. - Fracking is a very expensive option, so the cost will be passed on to the consumers.



ATTITUDES OF EXPLOITATION

| | Attitude to resource exploitation |
|----------------------|--|
| Individuals | <ul style="list-style-type: none"> • The initial cost of renewable energy (e.g. solar panels on roofs) is too expensive to put in place. • People living close to renewable energy sources, are against their use due to visual and noise pollution. • Local landowners can often generate money by renting out their land to the government for wind farms. • Workers in the oil industry don't want to lose their jobs. |
| Organisations | <ul style="list-style-type: none"> • Groups like Greenpeace and Friends of the Earth encourage the use of renewable energy to reduce our carbon footprint. • Companies, like McDonalds, promote themselves as a 'sustainable company' to give them a positive image • Smaller companies are sometimes unable to afford more sustainable/renewable options. • Large oil extraction companies, like BP or Shell, want to maintain the use of oil and natural gas. |
| Government | <ul style="list-style-type: none"> • The government will invest in renewable energy sources to meet UN or EU targets. • Large amounts of taxes are generated for the government from the use of oil. • Governments have to subsidise the cost of renewable energy resources, so the use of fossil fuels is cheaper. • Some countries have large amounts of energy resources (e.g. Qatar has oil reserves), which the country wants to export to generate money for the government. |

GERMANY MANAGING ENERGY

- Germany has closed nuclear and coal power plants to reduce greenhouse gas emissions. - The German government has invested in large solar power farms. The Bavaria Solar Park. - The German government have invested in offshore wind farms, producing 8% of Germany's total energy. - Germany offer financial grants to purchase solar panels. - The German government have given a €1bn subsidy to boost sales of electric cars. - Germany are on target to reduce their greenhouse gas emissions by 80% by 2050 (from the 1990 level).