

Britain's Energy Resources

Britain has the largest energy resources of any country in the European Union and is a major producer of oil, coal and natural gas. Other primary sources of energy are nuclear power, and to a lesser extent, water power.

1.1. Types of resources

The natural resources are naturally occurring substances that are considered valuable in their relatively unmodified form. They are classified into *renewable* and *non-renewable*.

Activity 1. Match the types of resources to their definition.

Renewable	a natural resource that, once consumed, cannot be replaced;
Non-renewable	a natural resource that can be totally replaced or is always available naturally, or that is practically inexhaustible;

Activity 2. Put the following natural resources in the correct column. One of them may be used in both of them.

tidal power, coal, wind power, wood, oil, nuclear power, wave power, gas, solar power, minerals, geothermal power, hydropower;

<i>Renewable resources</i>	<i>Non-renewable resources</i>

Activity 3. Read the information below and answer the questions or decide if the statements are true or false:

Renewable resources

Wind power is the conversion of wind energy into useful form, such as electricity, using *wind turbines*¹.

The UK is one of the best locations for wind power in the world, and is considered to be the best in Europe. At the beginning of January 2014, wind power in the United Kingdom consisted of 5,276 wind turbines.

¹ A **wind farm** or **wind park** is a group of wind turbines in the same location used to produce energy. A large wind farm may consist of several hundred individual wind turbines and cover an extended area of hundreds of square miles, but the land between the turbines may be used for agricultural or other purposes. A wind farm can also be located offshore.

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The United Kingdom is ranked as the world's **sixth** largest producer of wind power, having recently overtaken France and Italy.

It was in 1951 that the first utility grid-connected wind turbine to operate in the United Kingdom was built by John Brown & Company in the Orkney Islands.

The first commercial wind farm was built in 1991 at Delabole in Cornwall; it consisted of 10 turbines.

The offshore wind industry continued to develop in 2013 with the largest off-shore wind farm in the world, the **London Array**, in the Thames Estuary.

- A. 1. *How is wind energy transformed into electricity?*
2. *Where was the first wind turbine built?*
3. *Where was the first commercial wind farm built?*
4. *Where is the largest off-shore wind farm in the world?*

Tidal power is a form of hydropower that exploits the movement of water caused by tidal currents or the rise and fall in sea levels due to the tides.

The UK is currently the undisputed global leader in marine energy, with more wave and tidal stream devices installed than the rest of the world combined.

The Severn, Dee, Solway and Humber estuaries are all *potential sites* for tidal energy generating barrages in the UK, while Islay and the Pentland Firth are to host tidal turbine arrays. The Pentland Firth, the narrow run of water between the north-east tip of Scotland and the Orkney islands, is possibly the best place in the world to generate electricity from the movement of the tides.



- B. 1. *Tidal power is a form of hydropower that converts the energy of the tides into electricity.*
2. *There is no other country in the world with more wave and tidal stream devices installed than the UK.*
3. *The potential sites for tidal energy are all along the Scottish shores.*

Other renewable resources

- **Biomass**

Production of energy from biomass is expanding. In 2011 a new biomass energy centre was opened in Chilton, Durham. The supply of energy for biomass is more predictable than other forms of renewable energy. However people are concerned about how sustainable the sourcing of biomass is.

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Non-renewable resources

Fossil fuels (such as coal, petroleum and natural gas) and **nuclear power** are non-renewable resources, as they do not naturally re-form at a rate that makes the way we use them sustainable and consumer materials to produce electricity.

Coal mining has been an essential part of British industry since Roman times and took place in many different parts of the country.

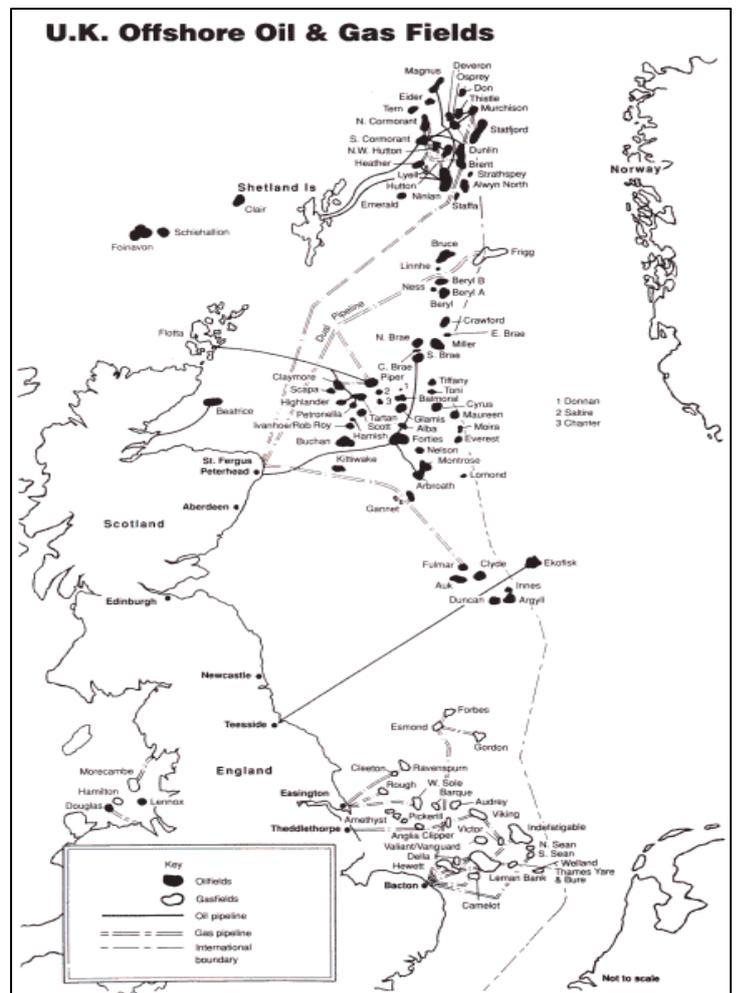
Coal occurs in the form of layers ('seams') in sequences of sedimentary rocks. Almost all onshore coal resources in the UK occur in rocks of the Carboniferous age, which also extend into the North Sea. Individual seams are up to 3.5m in thickness. Britain's *coalfields* are associated with Northumberland and Durham, North and South Wales, Yorkshire, Scotland, Lancashire, the East and West Midlands and Kent.

In 1970 it was the third largest producer of coal but coal production has declined rapidly since then. During the 1980s and 1990s the industry declined considerably. In 2013, there were three **deep-pit mines** in the UK. The United Kingdom produces about ten million tons of coal a year from **open-pit mines**. The majority comes from Scotland.

1. Which are the non-renewable resources?
2. Where do the coal resources occur?
3. When was the UK the third largest producer of coal?
4. Where is now most of the coal produced?

Oil and gas were discovered under the North Sea during the 1960s and new supplies are still being found today. Gas has been particularly important in replacing coal as a fuel for generating electricity.

In 2008, the UK was the 14th largest oil and gas producer in the world (10th largest gas producer and 19th largest oil producer). Within the EU, the UK is the largest producer of both oil and gas; in Europe, the UK is second only to Norway in oil and as production.



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Almost all UK oil and gas production comes from offshore, where there is a network of 14,000 km of pipelines linking 107 oil platforms, 181 gas platforms and a large number of subsea installations. There are 383 producing offshore fields, including 17 which started production in 2008.

- D.** 1. Where and when were oil and gas discovered?
2. What has replaced coal as fuel for generating electricity?
3. Where is almost all UK oil and gas produced?



Nuclear Power. Nuclear generation is presently expected to decline with phase-out of older fission plants, so that about half of the nuclear power production will be lost within 10 to 15 years. Some analyses are underway which may delay the decline.

Metals. Metal production in the United Kingdom has decreased over the past century. Iron and copper are no longer mined in significant quantities in the United Kingdom due to the effects of globalization. Copper from Chile and North America, and iron ore from China, Brazil and Australia are higher grades of metals at lower costs, lowering demand from the United Kingdom's copper and iron ore mines. Although large reserves of iron ore and copper are found in the United Kingdom, copper and iron ore are now largely imported from other countries. Tin and lead are still being mined from deep mines located in England, Scotland and Wales. Silver is also mined in small quantities from deep mines and separated from lead ore. The United Kingdom has a large variety of

important metals, but little metal is currently being mined in the United Kingdom.

- E.1.** Why are iron and copper are no longer mined in significant quantities in the UK?
2. Where are copper and iron ore imported from?
3. What metals are still being mined in the UK?

Minerals. The UK has relatively few mineral resources.

Many types of **industrial minerals** are found in the United Kingdom. The most common industrial minerals are sand, gravel, and cement used in construction products and road building.

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51% of minerals produced in the United Kingdom in 2011 were aggregates. With 80 quarries, Tarmac is the United Kingdom's largest producer of crushed rock, sand, and gravel.

Activity 4. Answer the following questions:

1. Energy resources that, once used, can replenish themselves and can be used again and again are called:
a) Non-renewable b) Renewable c) Potential
2. Energy resources that, once used, cannot be replaced are called:
a) non-renewable. b) renewable. c) infinite.
3. Which of the energy sources listed is NOT a renewable source of energy?
 - Oil
 - Solar
 - Wind
 - Tidal
 - Geothermal
4. What is the name given to the source of energy created with the burning of decaying plant or animal waste?
 - Oil
 - Coal
 - Geothermal
 - Biomass
 - Nuclear
5. Which energy source is derived from the movement of sea water in and out of turbines to generate electricity?
 - Wind
 - Hydro-electric power (HEP)
 - Tidal
 - Solar
 - Geothermal
6. Within the EU, the UK is the largest producer of:
a) oil b) gas c) both oil and gas
7. has been an important part of British industry since Roman times.
a) nuclear power b) wind power c) coal mining
8. An important renewable resource that is currently expanding is:
a) tidal power b) biomass c) wood
9. is a coalfield from England.
a) Yorkshire b) Islay c) South Wales
10. The industrial minerals are used in:
a) construction products b) road building c) both

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(source: <http://www.mapsofworld.com/united-kingdom/united-kingdom-mineral-map.html>)

Activity 5. Take into consideration the mineral symbols on the map above and mention the country where they are.

Resource	Country
Gold	
Salt	
Tin	
clays	
lead	
Iron ore	
copper	
Iron and steel	
coal	
Aluminium	