Name _____ Class _____ Date _____ /_____ /20_____

Finite and Renewable Resources

Finite Resources are those resources that are being used up faster than they can be replaced, or replenished. They will eventually run out. In the case of the three main FOSSIL FUELS Coal, Natural Gas and Crude Oil they will run out because they take millions of years to create.

Examples of finite resources

The chemical industry uses natural resources as the raw materials to make new products. Consider the following examples:

- metal ores used to extract metals
- crude oil used to make polymers and petrochemicals
- limestone to make cement and concrete
- crude oil to make the petrol, diesel and kerosene that we use for transport.

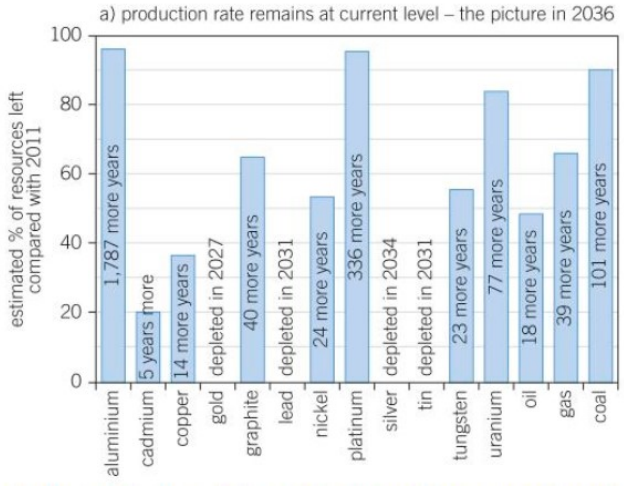
Examples of renewable resources

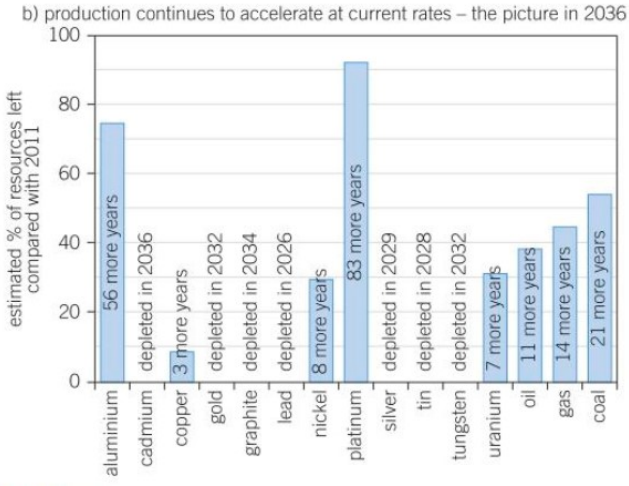
Wherever possible, industries are moving towards renewable resources to conserve finite resources and to improve sustainability. We can think of sustainability as developments that meet the needs of society now, without endangering the ability of future generations to meet their needs.

For example, in the plastics industry, many of the polymers produced use ethene made from crude oil as a starting material. However, ethene can also be made from ethanol, and ethanol can be made by fermenting glucose from sugar cane or sugar beet. So using a renewable crop as the raw material for ethene makes plastics such as poly(ethene) more sustainable than ones using up finite supplies of crude oil.

Another example is the use of wood chips instead of fossil fuels to fuel power stations, linked to a programme of planting new trees.

Renewable Resources are those resources that can be replenished at the same rate that they are being used. New, renewables are being discovered that can replace the need for finite resources, for example polyethene, made from oil, can now also be made from crops which are renewable (but there are ethical issues).





Using 'orders of magnitude' we can see that there is only 10^2 or 100 years of coal left for use at our current rate of consumption, and we can only estimate this because of the uncertainty in our calculations.

The sun is an amazing source of power, burning at 600 Million Tons of Hydrogen per second it can be estimated that there could be over 10^{11} years left in this star.

We are developing ways to harness solar power, these need to be explored deeper and deeper if we are to lower, or even remove, our dependency on fossil fuels.

Key points

- We rely on the Earth's natural resources to make new products and provide us with energy.
- Some of these natural resources are finite – they will run out eventually if we continue to exploit them, e.g. fossil fuels.
- Others are renewable – they can be replaced as we use them up, e.g. crops used to make biofuels.
- Estimates of the time left before fossil fuels run out can only be rough estimates, because of the uncertainty involved in the calculations.