

Chapter 11: Energy and water

- Benefits of higher energy consumption
 - Electricity makes life easier (TV, AC, heat, light, computers)
 - Modern transport systems are based mainly on oil / petroleum use
 - Industry requires energy to make it work (economy can't grow, wealth cannot be increased and people's lives will not be improved)
- The problems
 - The resources will soon run out
 - The use of fossil fuels is resulting in air pollution (global warming)
 - The inter-dependence of countries on each other for resources can lead to conflicts
 - Nuclear power is not safe (Japan – Fukushima power plant)
- A renewable fuel is one that is being formed as fast we are using it
- **Coal, oil and gas** are fossilized energy and are produced from organic material millions of years ago. When we use these fuels, we are actually using the sun's energy stored in the fossil fuels.
- Oil – Crude oil or petroleum, is a mixture of different hydrocarbons
 - It was formed from plankton that previously floated in the oceans and as they died, they fell to the seabed getting buried in the mud. Geological processes then converted the plankton into crude oil, which is now found soaked into porous rocks.
 - To extract it, oil rigs are located on land and sea which drill boreholes and the oil either comes out under its own pressure or needs pumping out.
- Advantages of oil: easy to transport by pipelines, less polluting than coal when burnt, it is also a raw material in the chemical industry.
- Disadvantages: burning oil produces greenhouse gases and can lead to increased global warming, oil spills pollute and kills wildlife, world oil production is concentrated in a small number of countries, work on offshore oil rigs can be dangerous
- Coal – it is a sedimentary rock that formed from trees growing in tropical swamp forests
 - The layers of coal seams are 1-4 meters thick and are found between other sedimentary rocks, such as sandstone and shale.
 - The two methods are deep underground mining (when the coal is deep underground) and opencast mining (quarrying // when the coal seams are closer to the surface)
- Deep underground mining is when shafts are either vertical or inclined. In vertical, elevators are used while in inclined, conveyer belts are used to bring the coal up to the surface
- Opencast mining is when the soil and overlying rocks are removed and stored thus the coal is exposed and extracted. After the coal is extracted, the waste rock and soil are put back and the land is returned to other uses
- Dangers of deep mining: visual pollution, subsidence (when the surface collapses), dangers such as gas explosions, accidents with machinery and roof collapses
- Dangers of opencast mining: visual pollution from excavation, temporary loss of land, noise pollution from the blasting and machinery and dust when the pit becomes dry