

- There are 3 major forms of fossil fuels: coal, oil and natural gas.
- All 3 were formed many 100's of millions of years ago before the time of the dinosaurs - hence the name fossil fuels!
- Fossil fuels were formed from the remains of dead plants and animals which sank to the bottom of swamps or oceans. This formed a layer referred to as peat. Over many 1000's of years this peat was covered by sand, clay and other minerals in a process called sedimentation.
- More and more rock piled on top of the peat, which increased the weight and therefore pressure. The pressure squeezed all the water out of the peat and over millions of years this turned into coal, oil or natural gas.
- Some scientists say that tiny diatoms are the source of oil. Diatoms are sea creatures the size of a pin head which, like plants, convert sunlight into stored energy.

## PETROLEUM & NATURAL GAS FORMATION



Tiny sea plants and animals died and were buried on the ocean floor. Over time, they were covered by layers of silt and sand.



Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.



Today, we drill down through layers of sand, silt, and rock to reach the rock formations that contain oil and gas deposits.

## Coal



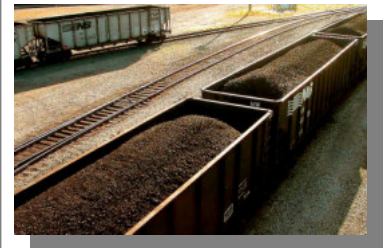
**Coal** is a hard, black coloured rock-like substance. It is made up of carbon and various other elements.

There are 3 main types of coal:

1. **Anthracite** (which is the hardest and has more carbon which gives it a higher energy content)
2. **Bitumous coal**
3. **Lignite** (which is the softest of the various coal types and is low in carbon)

Coal is mined and used extensively in coal-fired power stations to produce electricity.

Namibia has coal resources near Aranos, at a depth of 200 to 300 meters. They are not mined at present because of the considerable costs and technical difficulties involved.



## Natural Gas

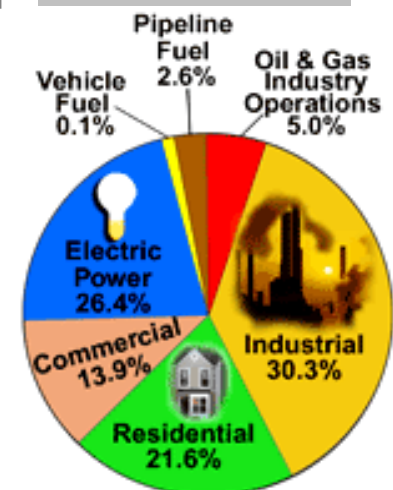


**Natural gas** is a gaseous fossil fuel consisting primarily of methane but includes significant quantities of other gases.

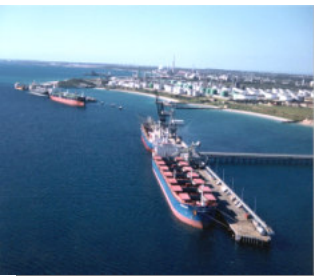
It is found in oil fields, natural gas fields and coal beds. Namibia has natural gas resources at the Kudu gas fields near Oranjemund in the Atlantic Ocean.

When methane-rich gases are produced through the decay of non-fossil organic materials, these are referred to as biogas. Sources of biogas include swamps, marshes and landfills.

## Gas consumption in the world



# Oil



Oil is a black liquid and is a fossil fuel which was formed more than 300 million years ago. Oil, or petroleum, is made of molecules called "hydrocarbons" which are combinations of hydrogen and carbon atoms.

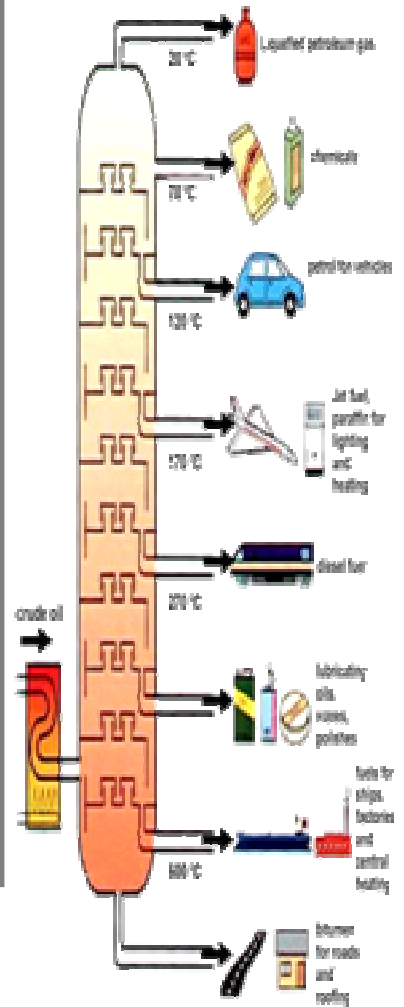
To find oil and natural gas, specialised companies drill into the deposits deep below the ground.

When these deposits are located on land, oil pumps are used to pump this liquid up. If the deposits are under water, gigantic oil rigs are used.

Oil pumped from the ground is called "crude oil". Crude oil needs to be refined or distilled in order to become useful. This is done at large oil refineries, from where oil is then transported by land or sea to all parts of the world.

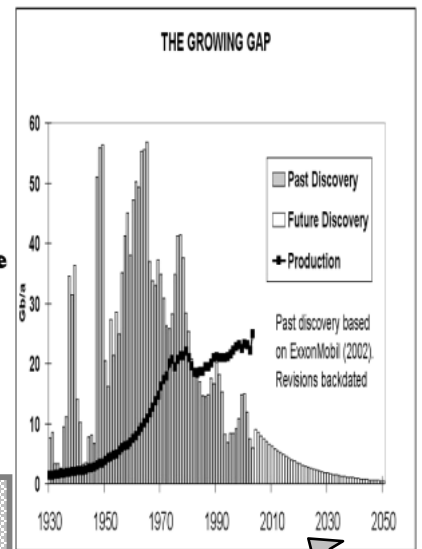
Namibia does not have any large proven oil resources and imports 100% of these fuels.

Oil is the source of many different fuels, such as petrol and diesel, and other materials such as plastic and chemicals.



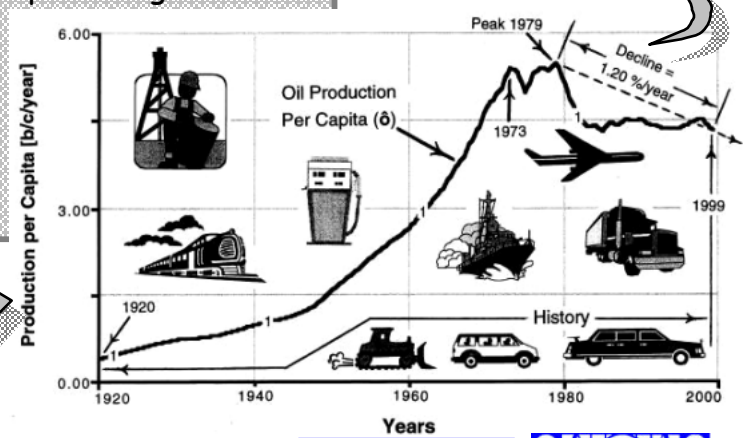
## What's made from oil?

your sunglasses    *the ink on this shirt*    all things plastic  
 probably your shoes  
 your computer    *paint*    cosmetics    your telephone  
**fertilizers for farms**    a surprising amount of food  
*the lubrication and fuel for your car*    most food packaging  
**the roads we drive on**    **insulation for your house**  
 millions of chemicals    *all synthetic clothing*  
**crayons**    **toys**



**Fossil fuels are limited resources**  
 This means that these fuels will not be available forever. Oil discoveries have declined rapidly and the cost of producing oil has increased.  
 It is estimated that there is still sufficient:

- Oil for 40 years
- Gas for 60 year
- Coal for 200 years



**Additional Information**

[http://en.wikipedia.org/wiki/Fossil\\_fuels](http://en.wikipedia.org/wiki/Fossil_fuels)  
[http://peakenergy.blogspot.com/2006\\_10\\_01\\_archive](http://peakenergy.blogspot.com/2006_10_01_archive)  
<http://www.eia.doe.gov/kids/energyfacts/sources/non-renewable/oil>

