

COAL AND PETROLEUM



Resources

We use various materials for our basic needs.

Some examples of Natural materials



AIR



WATER



SOIL

SUNLIGHT



PETROL



FRUITS



COAL





MINERALS

LPG



FOREST

CNG



Few examples of Man-Made material

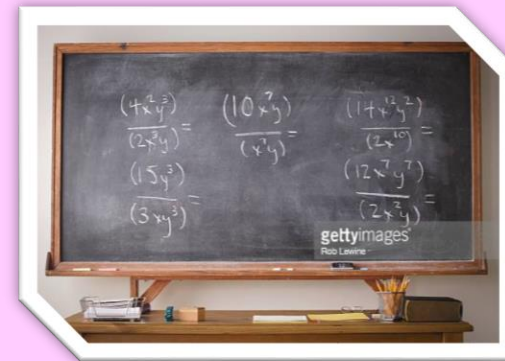


PLASTICS



BED

RUBBER



BLACKBOARD



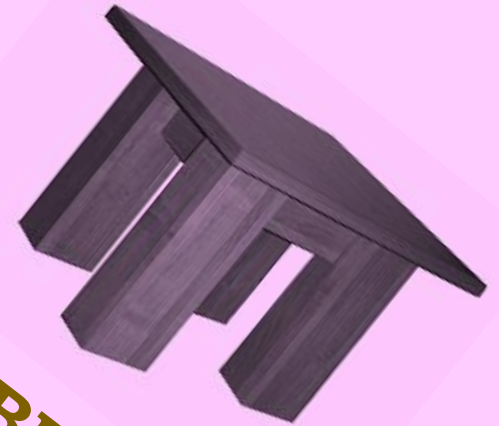
BUS



CHAIR

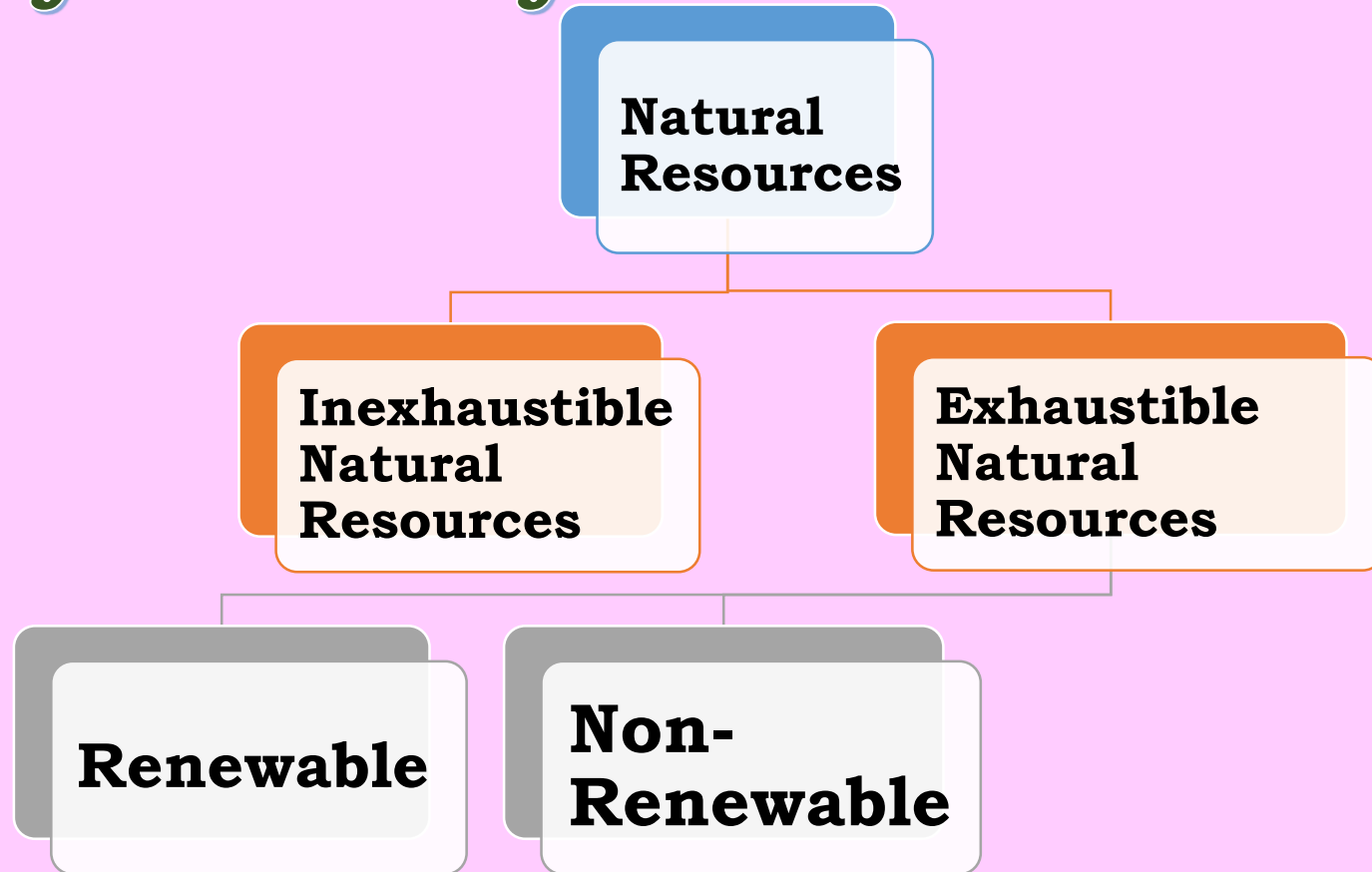


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TABLE

Classification of Natural Resources



Inexhaustible Natural Resources

These resources are present in unlimited quantity in nature and are not likely to be exhausted by human activities.

Ex: Sunlight, Air etc.

Exhaustible Natural Resources

The amount of these resources in nature is limited. They can be exhausted by human activities.

Ex: Forests, Wildlife, Minerals, Coal, Petroleum, Natural gas etc.

Fossil fuels

Materials that are formed from the dead remains of living organisms (fossils) are known as **fossil fuels**.

Examples: Coal, Petroleum and Natural gas



1. COAL

What is Coal?

Coal mainly consists of carbon. It also consists of some metal compounds and some other impurities.

Nature of Coal/Physical Property of Coal

Coal is as hard as stone and is black in colour.



Applications or Uses of Coal

- ❖ Coal is one of the fuels used to cook food.



Applications or Uses of Coal

❖ Earlier, it was used in railway engines to produce steam to run the engine.



Applications or Uses of Coal

- ❖ Coal is also used in thermal power plants to produce electricity.



Applications or Uses of Coal

- ❖ Coal is also used as a fuel in various industries.



Applications or Uses of Coal

- ❖ Coal is processed in industry to get some useful products such as coke, coal tar and coal gas.



Types of Coal

Anthracite:

It contains about 86–97% carbon.

Bituminous:

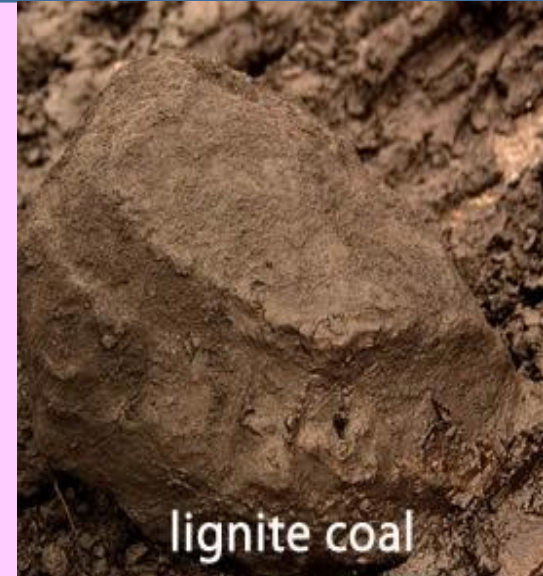
It contains about 46–86% carbon.

Sub-Bituminous:

It contains about 35–45% carbon.

lignite:

It contains about 25–35% carbon.



Formation of Coal

- About 300 million years ago the earth had dense forests in low lying wetland areas.
- Due to natural processes, like flooding, these forests got buried under the soil.
- As more soil deposited over them, they were compressed.
- The temperature also rose as they sank deeper and deeper.
- Under high pressure and high temperature, dead plants got slowly converted to coal.
- As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonisation.
- Since it was formed from the remains of vegetation, coal is also called a fossil fuel.

Mining of Coal

There are two ways to mine coal

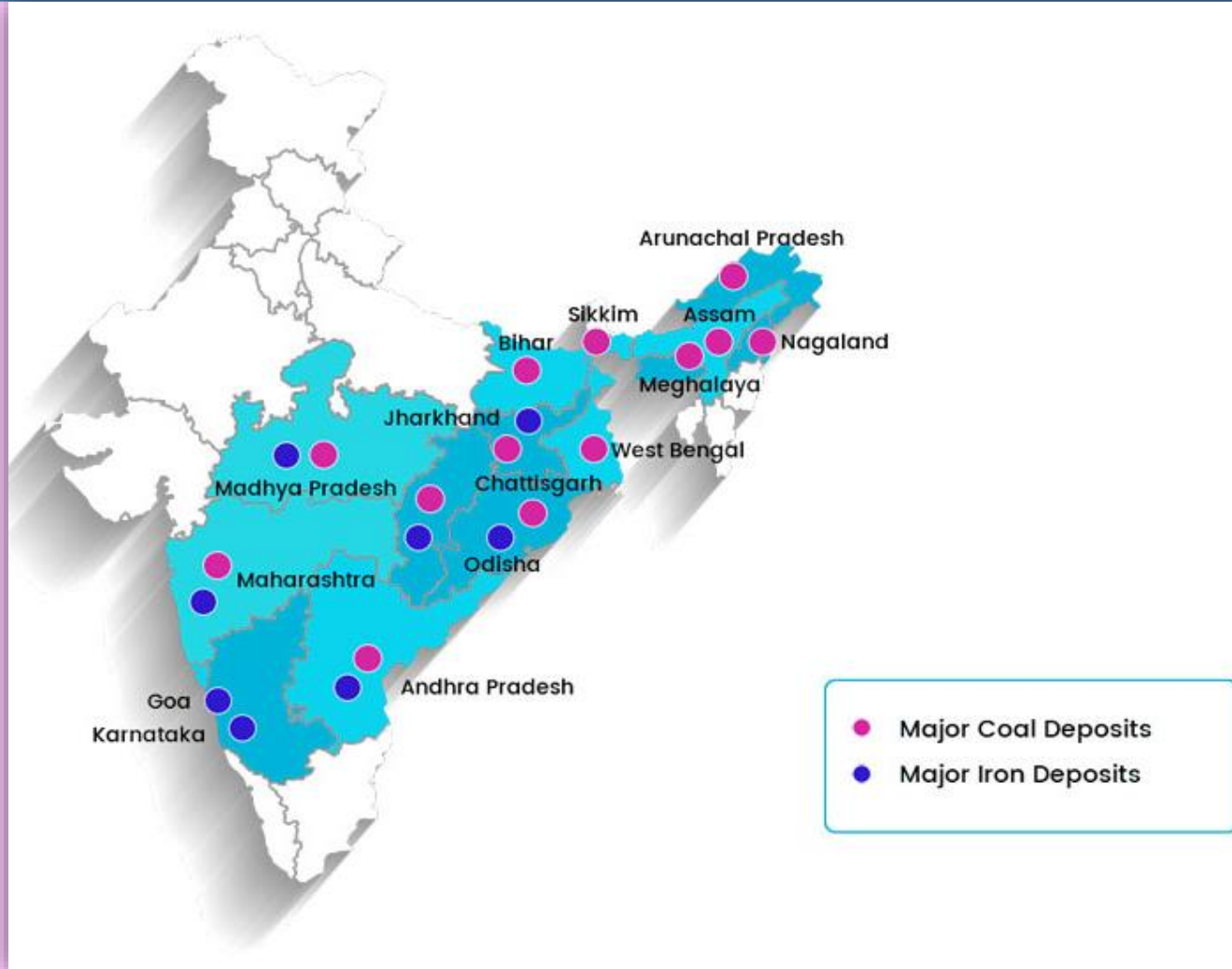
1. Surface mining



2. Underground mining



Coal Deposits in India



Diseases due to Coal Mining

When heated in air, coal burns and produces mainly carbon dioxide gas.

- Coal worker's pneumoconiosis, a dust induced scarring lung disease commonly called black lung.
- Chronic obstructive pulmonary disease
- Lung function impairment.
- Lung cancer
- Cardiovascular diseases
- Noise-induced hearing loss

COKE

Characteristics:

- It is a tough, porous and black substance.
- It is an almost pure form of carbon.

Uses:

Coke is used in the manufacture of steel and in the extraction of many metals.



COAL TAR

Characteristics:

- It is a black, thick liquid with an unpleasant smell. It is a mixture of about 200 substances.
- It is a by-product obtained during the formation of coke.

Uses:

- coal tar are used as starting materials for manufacturing various substances like synthetic dyes, drugs, explosives, perfumes, plastics, paints, photographic materials, roofing materials etc.
- naphthalene balls used to repel moths and other insects are also obtained from coal tar.



These days, bitumen, a petroleum product, is used in place of coal-tar for metaling the roads.



COAL GAS



Formation of Coal Tar

Coal gas is obtained during the processing of coal to get coke.

COAL GAS

Uses:

- It is used as a fuel in many industries situated near coal processing plants.
- Nowadays, it is used as a source of heat rather than light.

Coal gas was used for street lighting for the first time in London in 1810 and in New York around 1820.



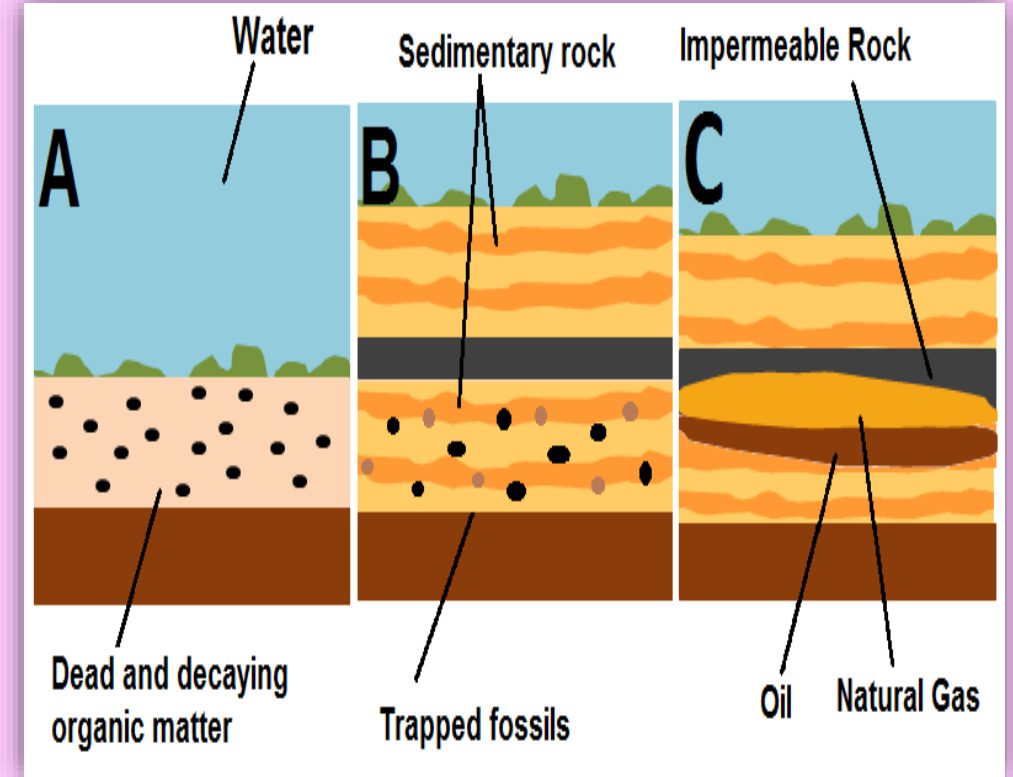
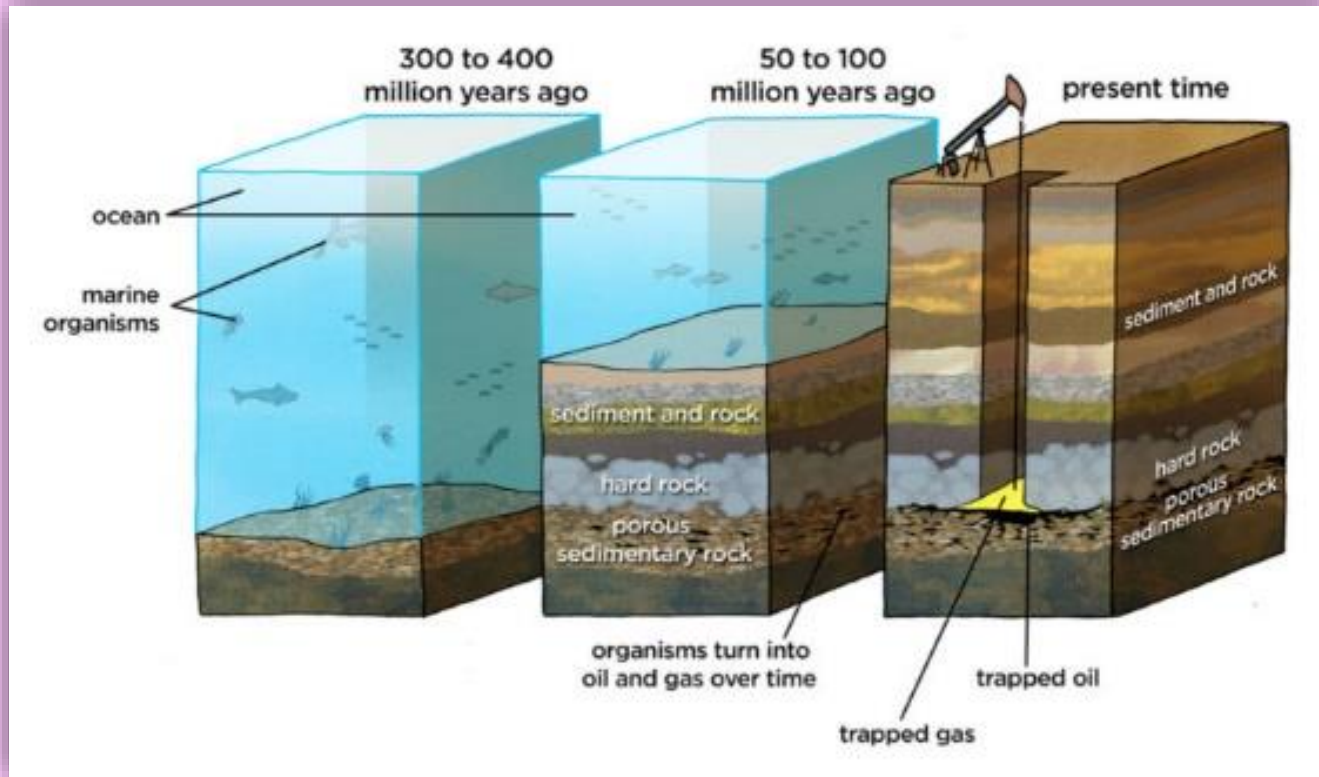
2. Petroleum

- ❑ **Petroleum** also known as **crude oil**.
- ❑ The word petroleum comes from Latin.
In Latin, **Petra** means **Rock** and **Oleum** means **Oil**.
Petroleum means **Rock Oil**
- ❑ Petroleum is a naturally occurring liquid. It is a mixture of various liquid hydrocarbons.

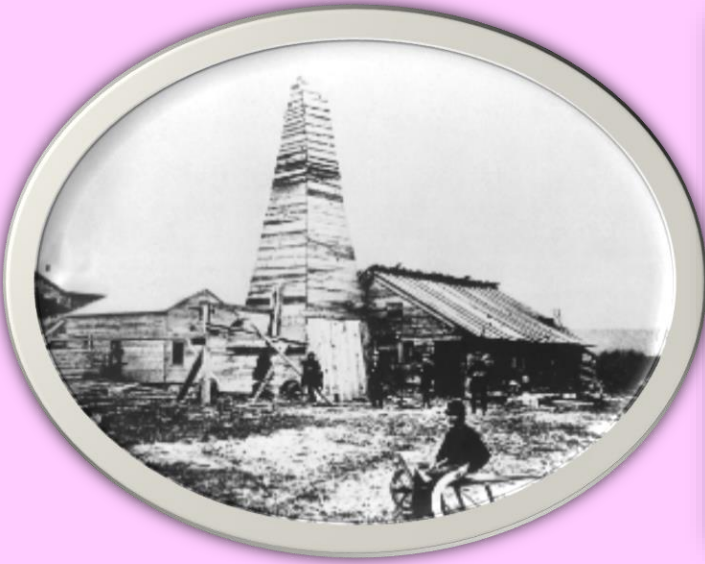
Formation of Petroleum

- ❖ Petroleum is formed by the burial of aquatic plants and animals below the sea bed.
- ❖ The marine animals and plants died thousands of years ago and settled down in the bottom of sea.
- ❖ In anaerobic conditions, microorganisms decompose this organic matter.
- ❖ Due to high pressure and heat, the dead remains of tiny plants and animals were slowly converted into petroleum.
- ❖ Over millions of years, these dead organisms turn into petroleum or natural gas due to the non-availability of proper oxygen, heat and constant high pressure.

Formation of Petroleum



Petroleum

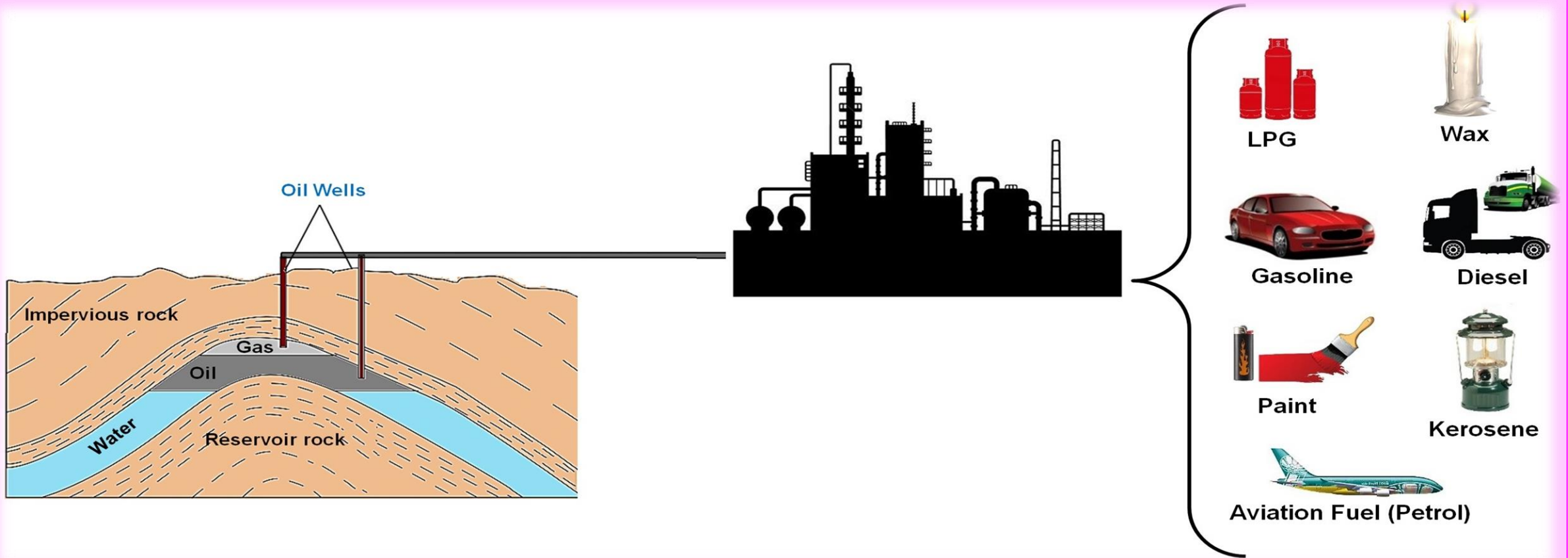


- The world's first oil well was drilled in Pennsylvania, USA, in 1859.
- Eight years later, in 1867, oil was struck at Makum in Assam.
- In India, oil is found in Assam, Gujarat, Mumbai High and in the river basins of Godavari and Krishna.

Refining of Petroleum

- ❖ The process of separating the various constituents of petroleum at different boiling points is known as refining.
- ❖ Natural petroleum is a crude dark coloured liquid with a very unpleasant smell. It cannot be used in its crude form.
- ❖ Hence, we find petroleum in several different products such as diesel, petrol, wax and use it for various purposes.

Refining of Petroleum



Various Constituents of Petroleum and their Uses

1. Petroleum Gas in Liquid Form(LPG)

Use: Fuel for home and Industry



Various Constituents of Petroleum and their Uses

2. Petrol

Use: Motor fuel, Aviation fuel, Solvent for dry cleaning



Various Constituents of Petroleum and their Uses

3.Kerosene

Use: Fuels for stove, Lamps and for Jet aircrafts



Various Constituents of Petroleum and their Uses

4. Diesel

Use: Fuel for heavy motor vehicles, Electric generators



Various Constituents of Petroleum and their Uses

5. Lubricating oil

Use: Lubrication



Various Constituents of Petroleum and their Uses

6. Paraffin wax

Use: Ointments, Candles, Vaseline etc.



Various Constituents of Petroleum and their Uses

7. Bitumen

Use: Paints, Road surfacing



Various Constituents of Petroleum and their Uses

S.No.	Constituents of Petroleum	Uses
1.	Petroleum Gas in Liquid form (LPG)	Fuel for home and industry
2.	Petrol	Motor fuel, aviation fuel, solvent for dry cleaning
3.	Kerosene	Fuel for stoves, lamps and for jet aircrafts
4.	Diesel	Fuel for heavy motor vehicles, electric generators
5.	Lubricating oil	Lubrication
6.	Paraffin wax	Ointments, candles, vaseline etc.
7.	Bitumen	Paints, road surfacing

3. Natural Gas

- ❖ Natural gas is a very important fossil fuel
- ❖ It is easy to transport through pipes.

Compressed Natural Gas (CNG):

- CNG is used for power generation.
- It is now being used as a fuel for transport vehicles because it is less polluting.
- It is a cleaner fuel.

Advantages of using CNG and LPG as fuels

- ❖ They burn with a smokeless flame and so do not cause any pollution.
- ❖ They leave no ash on burning.
- ❖ They are easy to handle and convenient to store.
- ❖ They have high calorific values.

Some Natural Resources are Limited

- They account for 90% of the energy being used today.
- Burning of these fuels is a major cause of air pollution.
- Their use is also linked to global warming.
- It is therefore necessary that we use these fuels only when absolutely necessary.

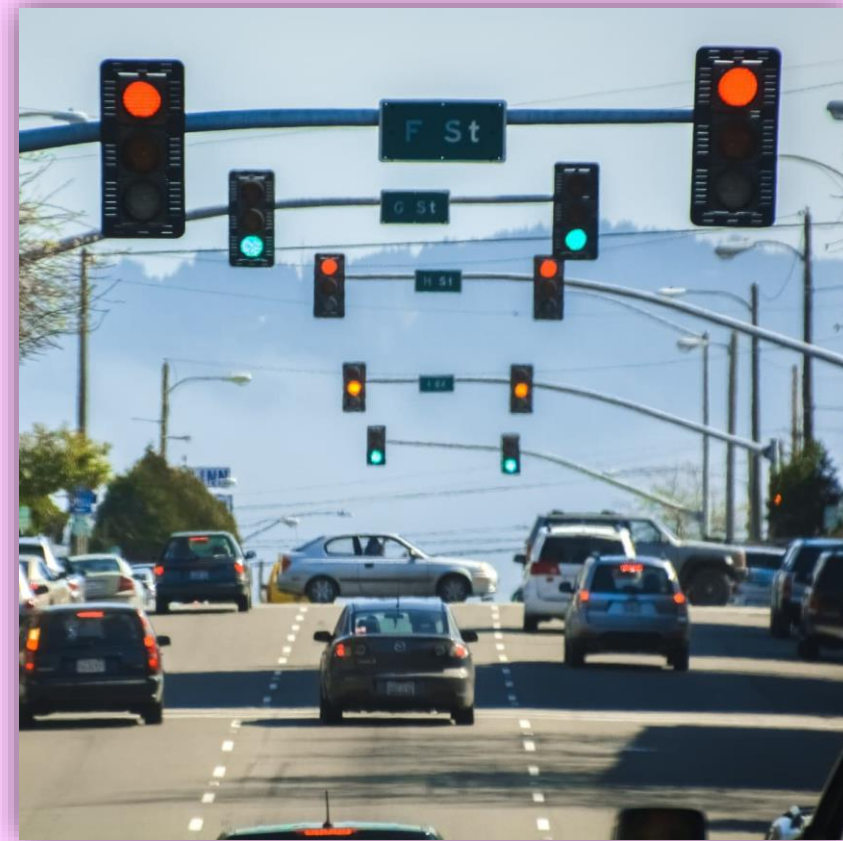
The Petroleum Conservation Research Association (PCRA)

Advises people how to save petrol/diesel while driving:-

- ❖ Drive at a constant and moderate speed as far as possible



- ❖ Switch off the engine at traffic lights or at a place where you have to wait



❖ Ensure correct tyre pressure.



❖ Ensure regular maintenance of the vehicle.



Alternate Sources of Energy



SOLAR



HYDRO



GEO THERMAL



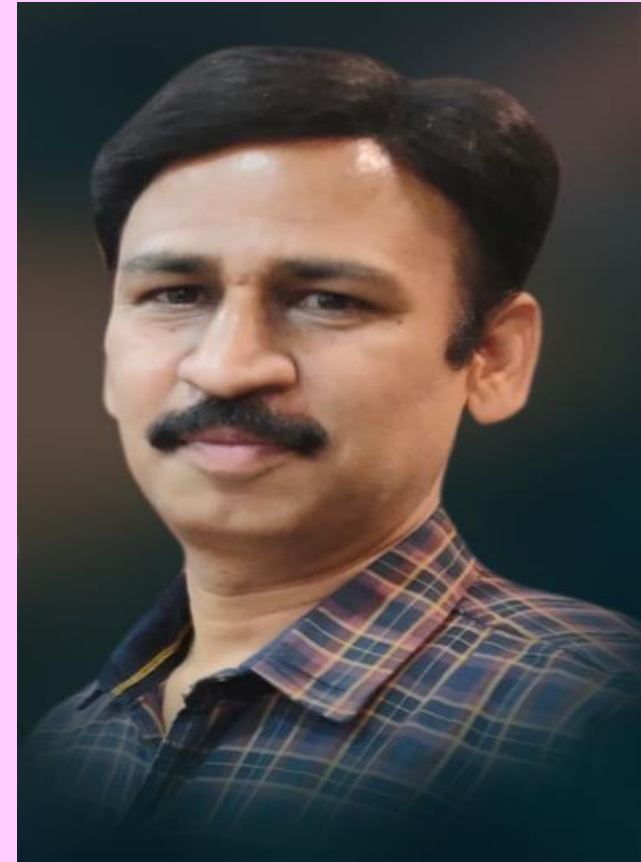
TIDAL



WIND



BIOMASS



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