



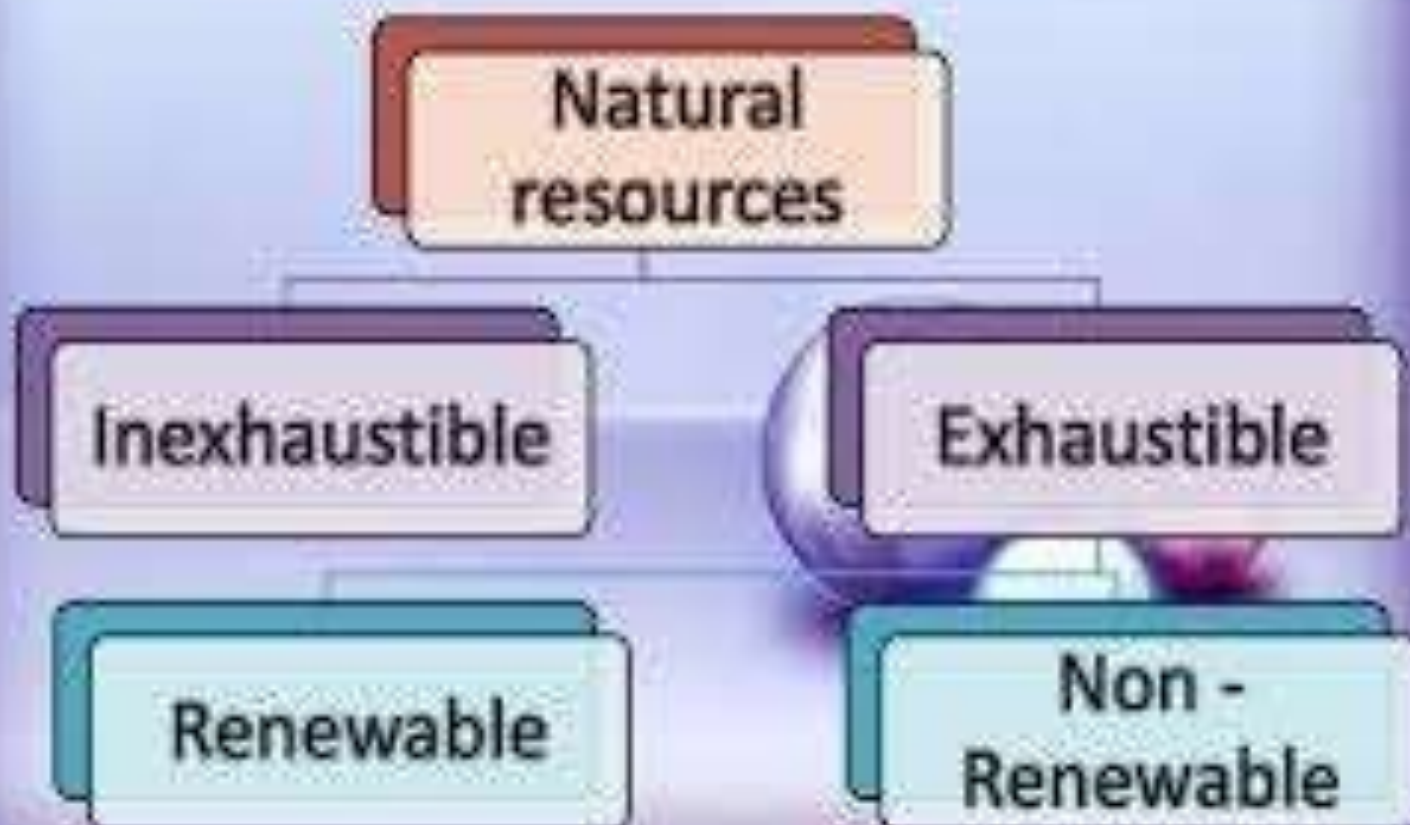
CHAPTER 5

FUELS AND ENERGY

RESOURCES

- We use various materials for our basic needs. Some of them are found in nature and some have been made by human efforts.
- All things which are obtained from nature, they are called natural resources.

Classification of Natural resources



Resources can be broadly classified into two kinds:

INEXHAUSTIBLE RESOURCES

- These resources are present in unlimited quantity in nature and are not likely to be exhausted by human activities.
- Ex. Sunlight, air.



EXHAUSTIBLE 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.



- Natural resources like coal, petroleum and natural gas were formed from the dead remains of living organisms (fossils). So, these are all known as **fossil fuels**.



COAL

- It is as hard as stone and is black in color.
- Coal is one of the fuels used to cook food.
- Earlier, it was used in railway engines to produce steam to run the engine.
- It is also used in thermal power plants to produce electricity.
- Coal is also used as a fuel in various industries.



STORY 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.

A COAL MINE



COAL

- As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonization.
- Since it was formed from the remains of vegetation, coal is also called a fossil fuel.
- When heated in air, coal burn and produces mainly carbon dioxide gas.

Some Useful Products from coal

❖ **COKE**

- It is a tough, porous and black substance.
- It is an almost pure form of carbon.
- Coke is used in the manufacture of steel and in the extraction of many metals.



❖ **COAL TAR**

- It is a black, thick liquid with an unpleasant smell.
- It is a mixture of about 200 substances.
- Products obtained from coal tar are: synthetic dyes, drugs, explosives, perfumes, roofing materials, paints, etc.
- Naphthalene balls used to repel moths and other insects are also obtained from coal tar.



❖ **COAL GAS:**

- Coal gas is obtained during the processing of coal to get coke.
- It is used as a fuel in many industries situated near the coal processing plants.



PETROLEUM

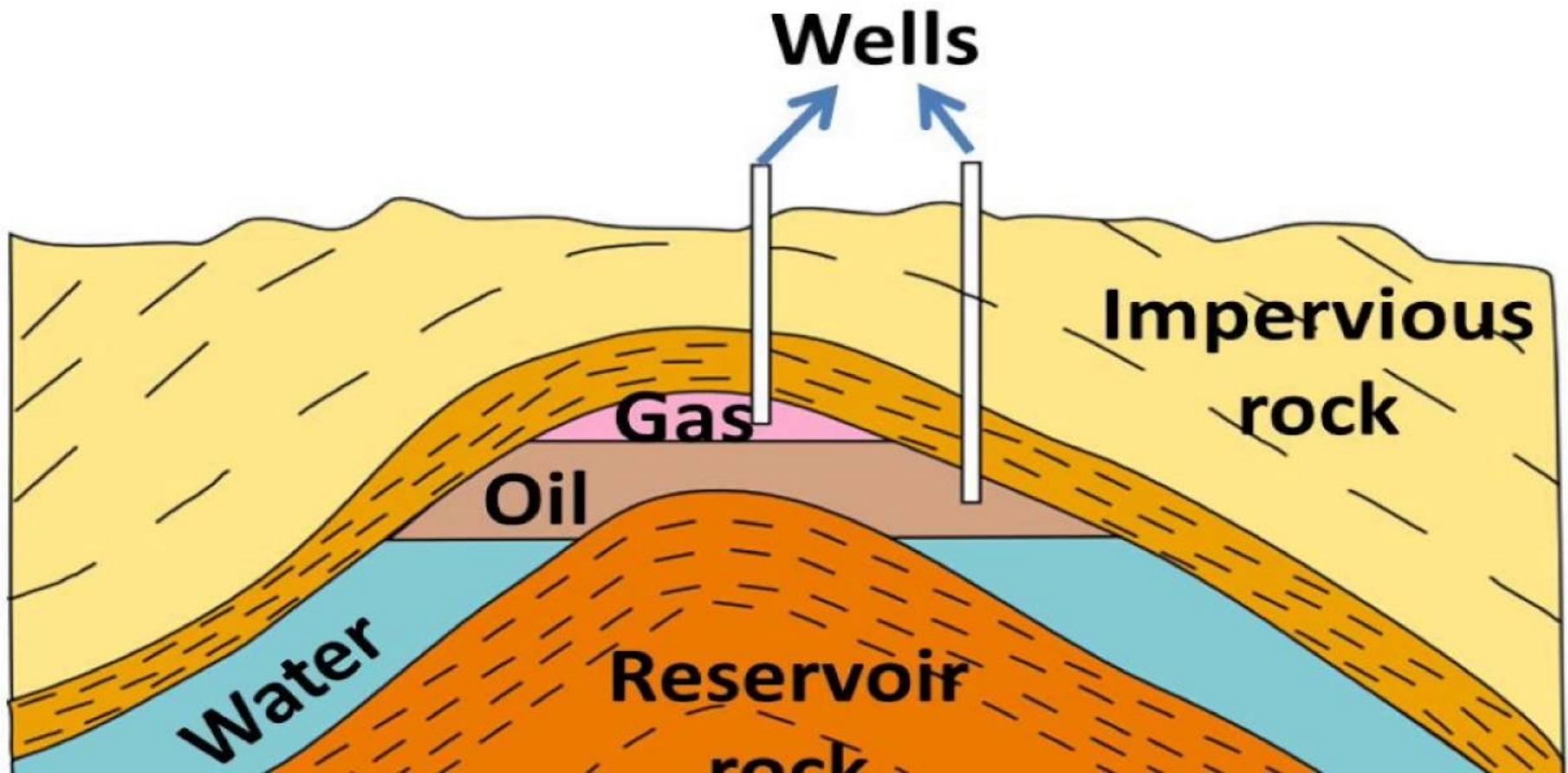
- Petrol is used as a fuel in light automobiles such as motor cycles/scooters and cars.
- Heavy motor vehicles like trucks and tractors run on diesel.
- Petrol and diesel are obtained from a natural resource called petroleum.



FORMATION OF PETROLEUM

- Petroleum was formed from organisms living in the sea.
- As these organisms died, their bodies settled at the bottom of the sea and got covered with layers of sand and clay.
- Over million of years, **absence of air, high temperature and high pressure transformed the dead organisms into petroleum and natural gas.**

PETROLEUM AND NATURAL GAS *DEPOSITS*



REFINING OF PETROLEUM



- Petroleum is a dark oily liquid. It has an unpleasant odor. It is a mixture of various constituents such as petroleum gas, petrol, diesel, lubricating oil, paraffin wax, etc.
- The process of separating the various constituents/ fractions of petroleum is known as refining. It is carried out in a petroleum refinery.

Various constituents of petroleum and *their uses*

CONSTITUENTS	USES
<ul style="list-style-type: none">• Liquified petroleum gas (LPG)• Petrol• Kerosene • Diesel• Lubricating oil• Paraffin wax• Bitumen	<ul style="list-style-type: none">• Fuel for home and industry.• Motor fuel, solvent for dry cleaning.• Fuel for stoves, lamps and for jet aircrafts.• Fuel for heavy motor vehicles, electric generators.• Lubrication• Ointment, candles, Vaseline, etc.• Paints, road surfacing

NATURAL GAS

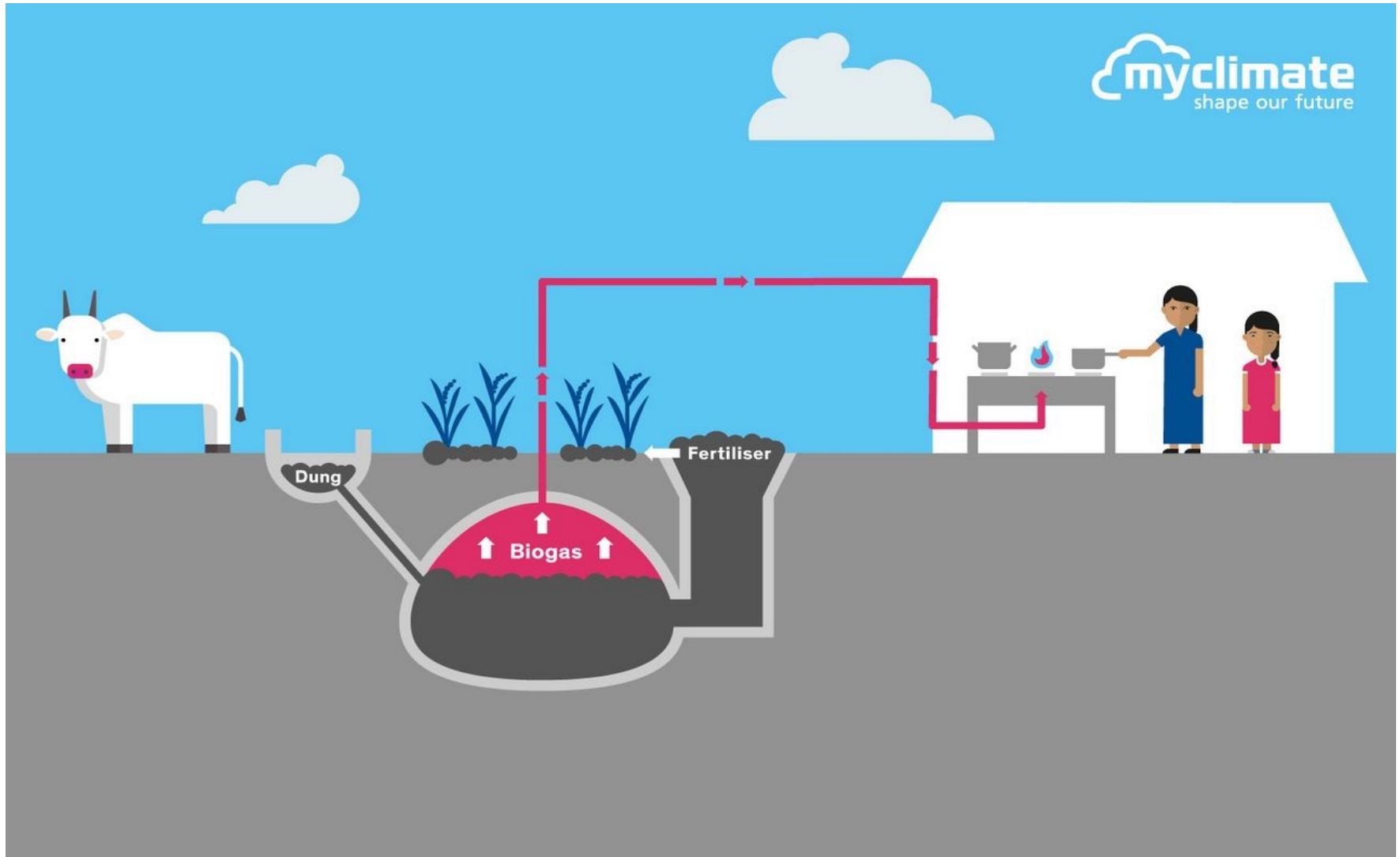
- Natural gas is a very important fossil fuel because it is easy to transport through pipes.
- Natural gas is also used as a starting material for the manufacture of a no. of chemicals and fertilizers.
- In India, natural gas has been found in Tripura, Rajasthan, Maharashtra and in the Krishna Godavari delta.



COMPRESSED NATURAL GAS



BIOGAS(METHANE)



PETROLEUM CONSERVATION

- In INDIA, the ***Petroleum Conservation Research Association (PCRA)*** advises people how to save petrol/ diesel while driving. Their tips are
- 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.