MINERALS AND ENERGY RESOURCES

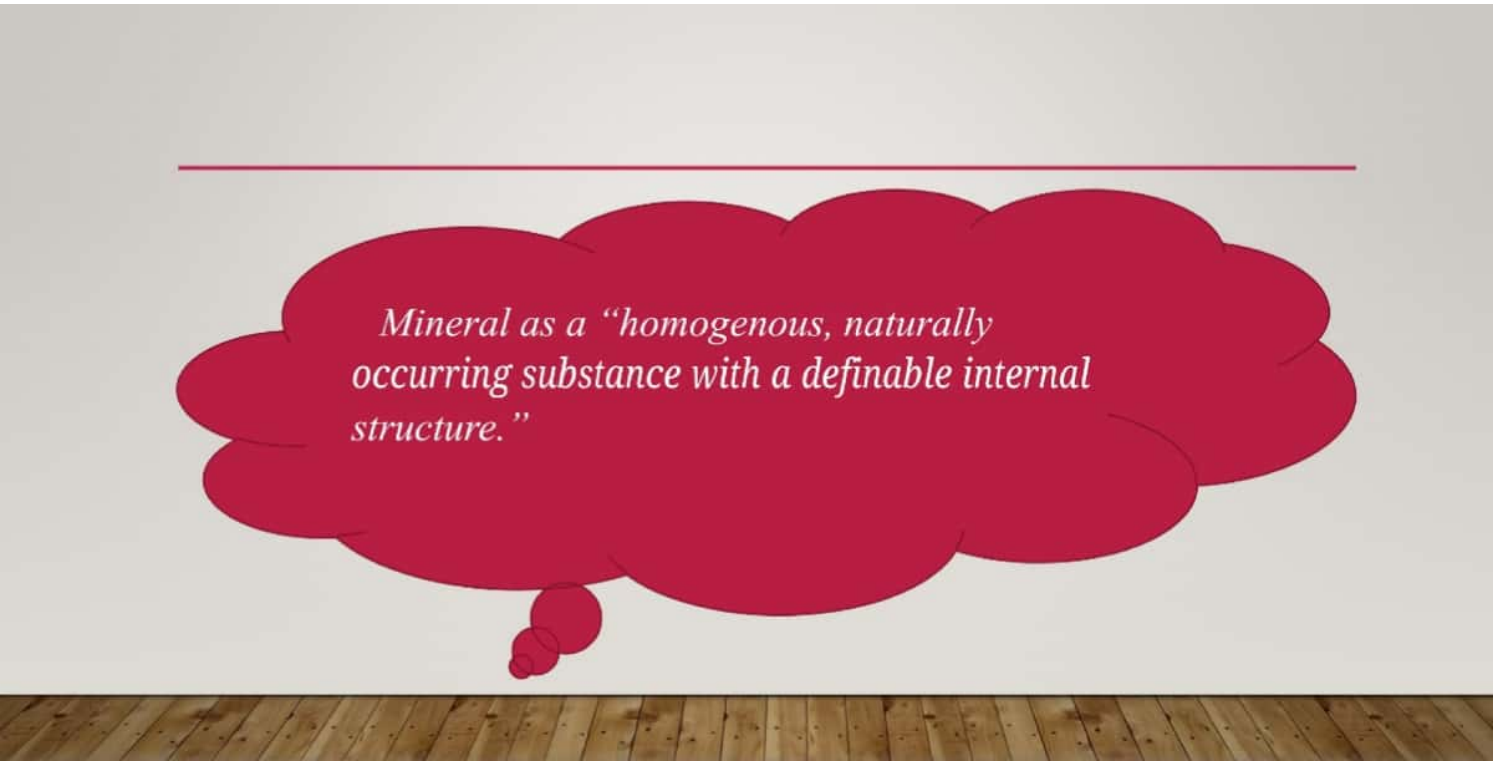
CLASS X

OBJECTIVE :

- Various types of minerals as well as their uneven nature of distribution and explain their need for their judicious utilization.
- Discuss various types of conventional and non conventional resources and their utilization.

THAT'S WHY MINERALS ARE IMPORTANT TO US.

- Minerals are an indispensable part of our lives.
- Almost everything we use, from a tiny pin to a towering building or a big ship, all are made from minerals.
- The railway lines and the tarmac (paving) of the roads, our implements and machinery too are made from minerals.
- Cars, buses, trains, aeroplanes are manufactured from minerals and run on power resources derived from the earth.
- Even the food that we eat contains minerals. In all stages of development, human beings have used minerals for their livelihood, decoration, festivities, religious and ceremonial rites.



OCCURRENCE OF MINERALS

- In igneous and metamorphic rocks
- In sedimentary rocks
- Evaporation
- Residual mass of weathered material
- Alluvial deposits/ 'placer deposits'

CLASSIFICATION OF MINERALS:

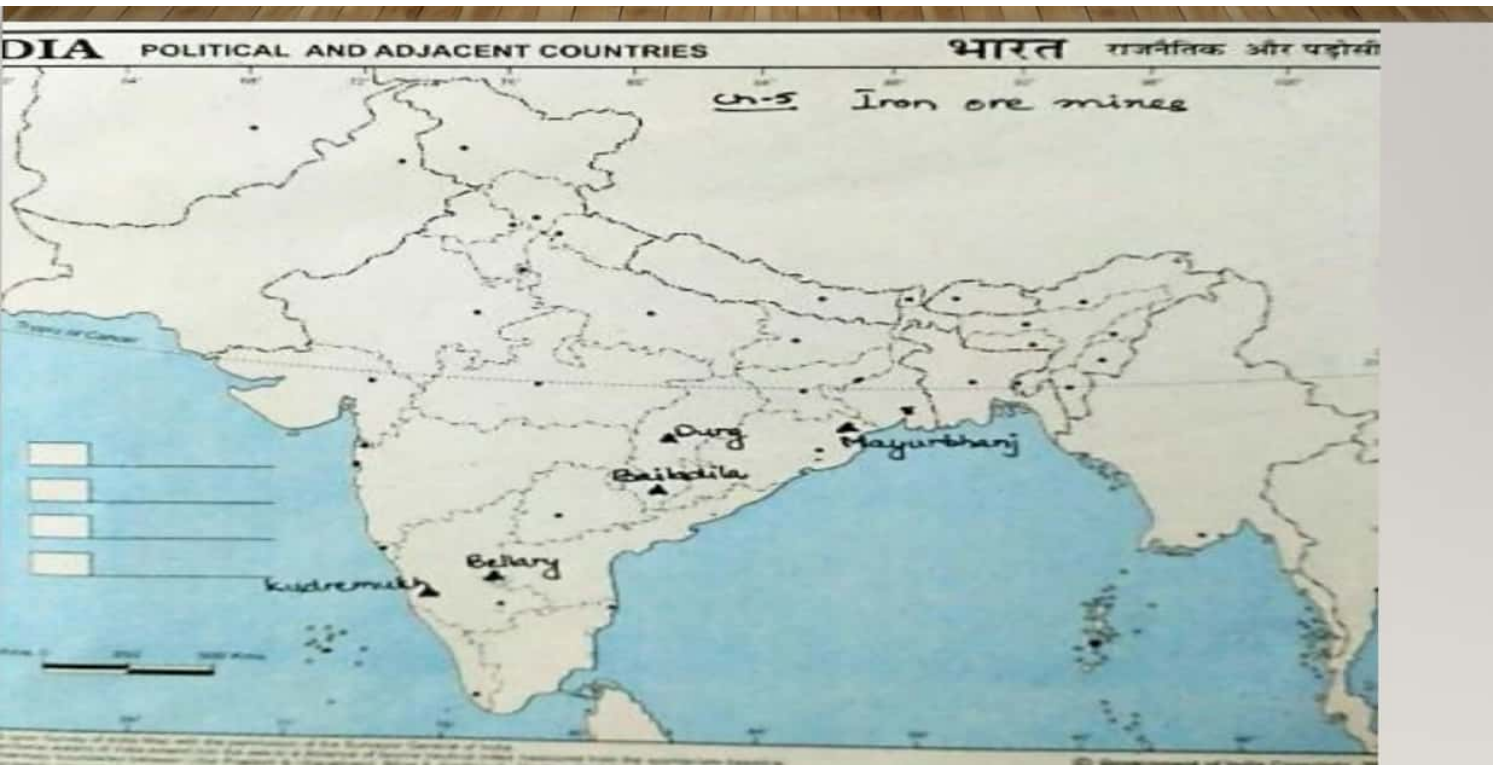
- METALLIC
- NON METTALIC
- ENERGY RESOURCES.

IRON ORE

- TWO TYPES OF IRON ORE
- **Magnetite** is the finest iron ore with a very high content of iron up to 70 per cent. It has excellent magnetic qualities, especially valuable in the electrical industry.
- **Hematite ore** is the most important industrial iron ore in terms of the quantity used, but has a slightly lower iron content than magnetite. (50-60 per cent).
-

DISTRIBURION OF IRON ORE

- **FOUR MOJOR BELTS**
- Orissa-Jharkhand belt
- Durg-Bastar-Chandrapur
- Bellary-Chitradurga-Chikmaglur-Tumkur belt
- Maharashtra-Goa



Distribution of copper

- Balaghat

Singbhum

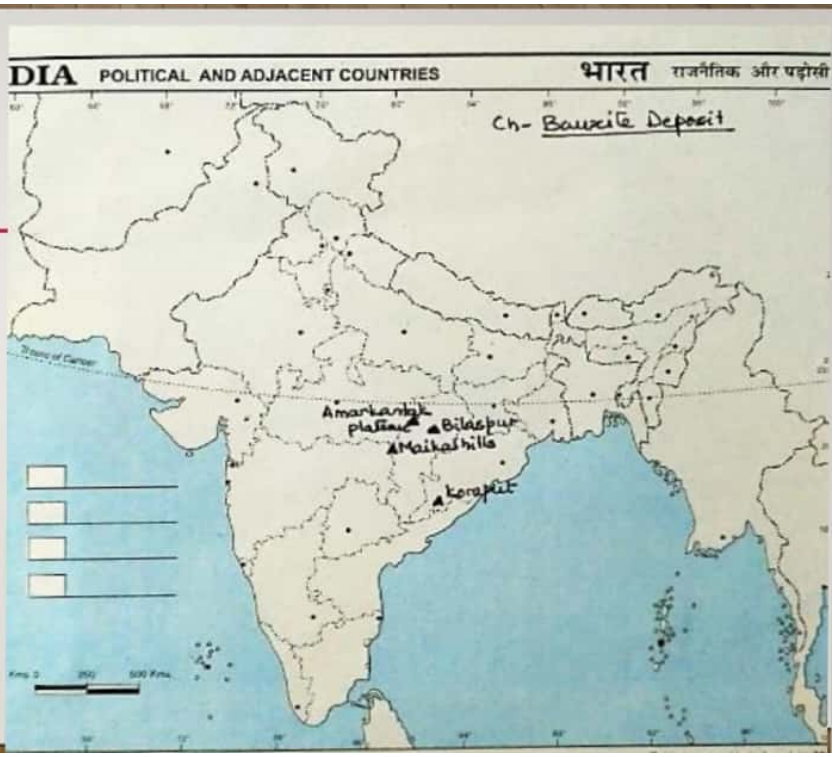
Khetrimine

Distribution of Bauxite

Orissa
Koraput
district

Madhya
Pradesh
Amarkantak
plateau,
Katni,
Maikal hills

Chattisgarh
Bilaspur

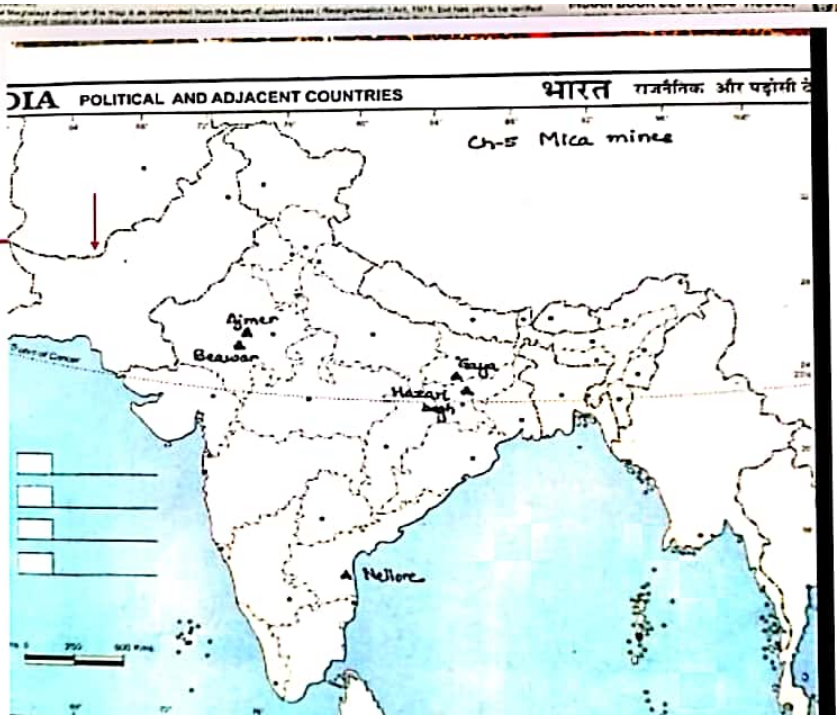


Distribution of Mica :

Rajasthan
Ajmer
Beawar

Bihar and
Jharkhand
Koderma Gaya –
northern edge of
the Chota Nagpur
plateau
Hazaribagh

Andhra
Pradesh
Nellore



TYPES OF MINING

Open pit mine

2. Quarry : A quarry is the same thing as an open-pit mine from which minerals are extracted. The only difference between the two is that open-pit mines that produce building materials and dimension stone are commonly referred to as quarries

UNDERGROUND MINE WITH SHAFTS

Rat-Hole Mining:

Meghalaya, there are large deposits of coal, iron ore, limestone and dolomite etc. Coal mining in Jowai and Cherapunjee is done by family member in the form of a long narrow tunnel, known as 'Rat hole' mining

IMPACTS OF MINING ON THE HEALTH OF THE MINERS AND THE ENVIRONMENT

- The dust and noxious fumes inhaled by miners make them vulnerable to pulmonary diseases.
- The risk of collapsing mine roofs, inundation and fires in coalmines are a constant threat to miners.
- The water sources in the region get contaminated due to mining.
- Dumping of waste and slurry leads to degradation of land, soil, and increase in stream and river pollution.
- *Stricter safety regulations and implementation of environmental laws are essential to prevent mining from becoming a "killer industry"*

WHY CONSERVATION OF MINERALS IS THE NEED OF THE HOUR?

ENERGY RESOURCES-
ENERGY RESOURCES CAN BE CLASSIFIED AS CONVENTIONAL AND NONCONVENTIONAL SOURCES.

Conventional Sources of Energy	Non-Conventional Sources of Energy
The sources of energy which have been in use for a long time, e.g., coal, petroleum, natural gas and water power.	The resources which are yet in the process of development over the past few years. It includes solar, wind, tidal, biogas, and biomass, geothermal
They are exhaust able except water	They are inexhaustible
They cause pollution when used, as they emit smoke and ash.	They are generally pollution free.
They are very expensive to be maintained, stored and transmitted as they are carried over long distance through transmission grid	. Less expensive due to local use and easy to maintain.

MOST COMMON FUEL IN RURAL INDIA

- Fire wood
- Cattle dung cake

COAL

- Most abundantly available fossil fuel.
- It provides a substantial part of the nation's energy needs.
- It is used for power generation, to supply energy to industry as well as for domestic needs.
- India is highly dependent on coal for meeting its commercial energy requirements.
- Formation : Compression of plant material over millions of years

COAL FOUND IN A VARIETY OF FORMS

Found in a variety of forms

Carbon content

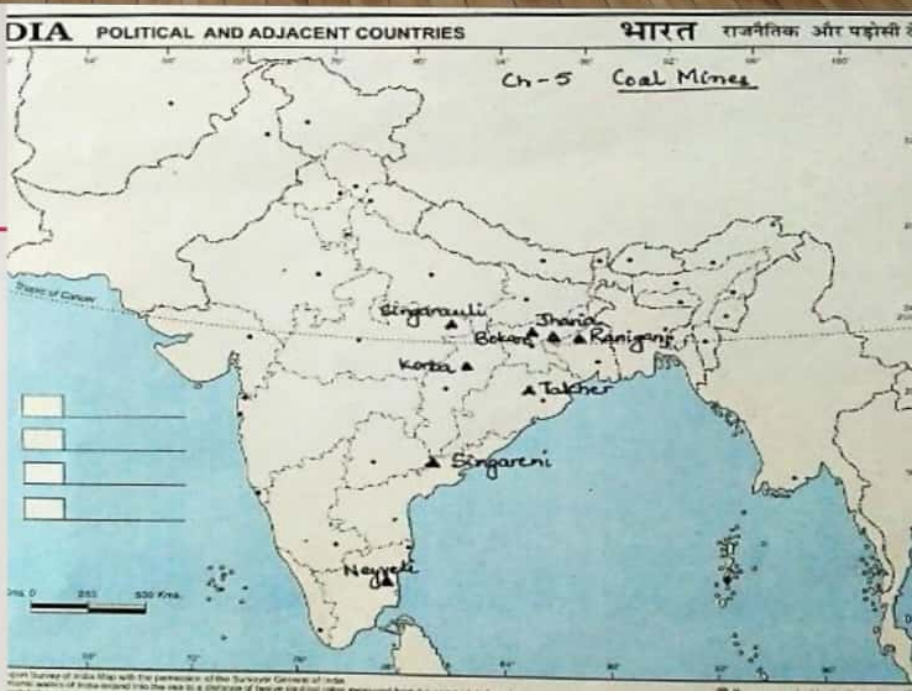
- Peat
- Lignite
- Bituminous
- Anthracite

Rock series

1. Gondwana
2. Tertiary

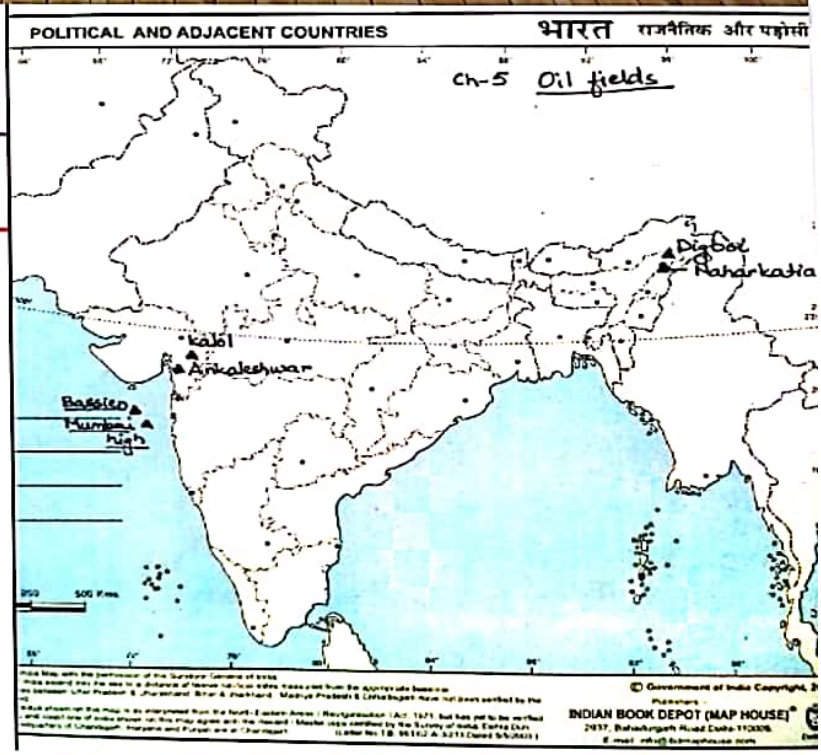
MAP WORK

The major resources of Gondwana coal, which are metallurgical coal, are located in Damodar valley (West Bengal-Jharkhand). Jharia, Raniganj, Bokaro are important coalfields. The Godavari, Mahanadi, Son and Wardha valleys also contain coal deposits. Tertiary coals occur in the north eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

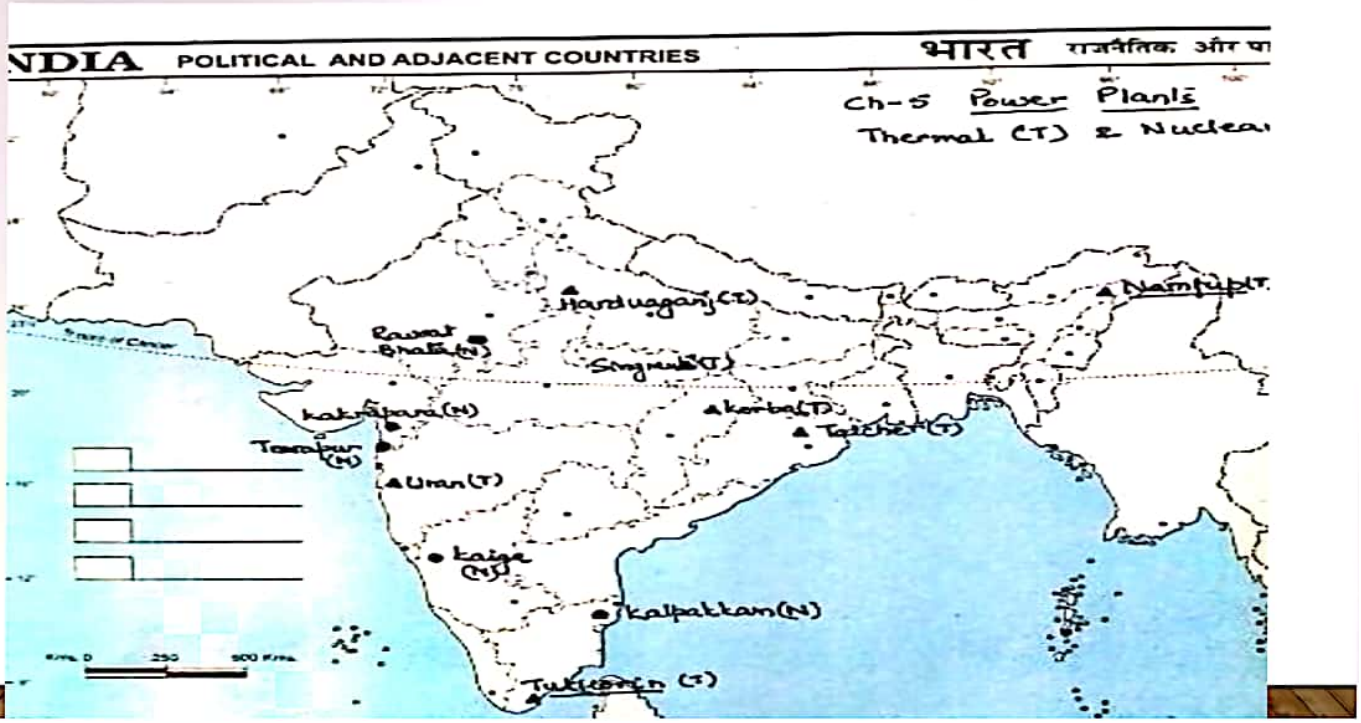


PETROLEUM DEPOSITS –

- Petroleum is also found in fault traps between porous and non-porous rocks.
- Gas, being lighter usually occurs above the oil.
- About 63 per cent of India's petroleum production is from Mumbai High,
- 18 per cent from Gujarat and 16 per cent from Assam.



LOCATION OF THERMAL AND NUCLEAR POWER PLANTS



"INDIA IS FORTUNATE TO HAVE FAIRLY RICH AND VARIED MINERAL RESOURCES BUT THESE ARE UNEVENLY DISTRIBUTED".

- Broadly speaking, peninsular rocks contain most of the reserves of coal, metallic minerals, mica and many other non-metallic minerals.
- Sedimentary rocks on the western and eastern flanks of the peninsula, in Gujarat and Assam have most of the petroleum deposits.
- Rajasthan with the rock systems of the peninsula, has reserves of many non-ferrous minerals.
- The vast alluvial plains of north India are almost devoid of economic minerals.
- These variations exist largely because of the differences in the geological structure, processes and time involved in the formation of minerals.

NON CONVENTIONAL ENERGY RESOURCES-

uclear and Atomic ergy	**Uranium and thorium, which are available in Jharkhand and the Aravallis The Monazite sands of Kerala is also rich in thorium.**	**Nuclear or Atomic Energy is obtained by altering the structure of atoms**
olar Energy	The largest solar plant of India is located at Madhapur, near Bhuj, where solar energy is used to sterlise milk cans	Photovoltaic technology converts sunlight directly into electricity
dal Energy	Oceanic tides can be used to generate electricity. Floodgate dams are built across inlets. During high tide water flows into the inlet and gets trapped when the gate is closed. After the tide falls outside the flood gate, the water retained by the floodgate flows back to the sea via a pipe that carries it through a power-generating turbine.	Gulf of Kuchchh, provides ideal conditions for utilising tidal energy
ind Energy	The largest wind farm cluster is located in Tamil Nadu from Nagarcoil to Madurai. Nagarcoil and Jaisalmer are well known for effective use	Use winds to generate energy.

NON CONVENTIONAL ENERGY RESOURCES-

Bio gas	**Shrubs, farm waste, animal and human waste are used to produce biogas for domestic consumption in rural areas. Decomposition of organic matter yields gas**	**The plants using cattle dung are know as 'Gobar gas plants' in rural India. These provide twin benefits to the farmer in the form of energy and improved quality of manure**
Geo thermal energy	Geothermal energy refers to the heat and electricity produced by using the heat from the interior of the Earth	Two experimental projects have been set up in India to harness geothermal energy. One is located in the Parvati valley near Manikarn in Himachal Pradesh and the other is located in the Puga Valley, Ladakh