Energy resources

An energy resources is something that can produce heat, power life, move objects,or produce electricity.

Energy resources can be classified into two types:

1) Conventional sources of energy or non- renewable:- the **energy source** which is obtained from fixed reserves in nature like oil, gas and coal. These sources are not present in our environment abundantly.
2) Non- conventional sources or renewable sources of energy:- e**nergy** generated by using wind, tides, solar geothermal heat and biomass including farm and animal waste as well as human excreta is known as **non-conventional energy**. These sources are present in environment in large quantity but not used properly.

Firewood and cattle dung cake: As per estimates, more than 70% of energy need in rural households is met by firewood and cattle dung cake. A decreasing forest area is making it difficult to use firewood. Dung cake can be put to better use in the form of manure and hence its use should also be discouraged.

Coal:

India is highly dependent on coal for meeting its commercial energy requirements. Depending on the degree of compression during its formation, there are varieties of coal.

a. **Lignite:** It is a low grade brown coal. It is soft and has high moisture content. Neyveli in Tamil Nadu has the main reserves of lignite coal. This type of coal is used for electricity generation.
b. **Bituminous coal:** Coal which was formed because of increased temperature and was buried very deep is called bituminous coal. This is the most popular coal for commercial use. High grade bituminous coal is ideal for use in metallurgy(special value in the smelting of iron in blast furnaces.
c. **Anthracite coal:** This is the highest quality hard coal.

In India, coal occurs in rock series of two main geological ages:-

. The Gondwana coal was formed over 200 million years ago.

. The tertiary deposits are about 55 million years old.

. The major sources of Gondwana coal are located in the Damodar valley (West Bengal-Jharkhand). In this belt; Jharia, Raniganj and Bokaro are important coalfields. Coal deposits are also present in the Godavari, Mahanadi, Son and Wardha valleys.

. Tertiary coal is found in the north-eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

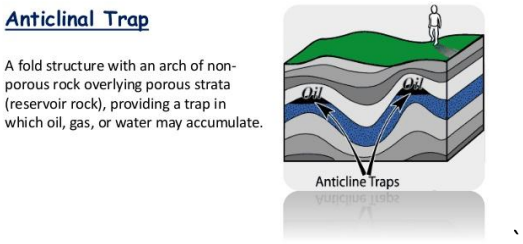
Petroleum

After coal, the next major energy resource in India is petroleum.

Petroleum is a major source of fuel for various uses. Petroleum also provides raw materials for various manufacturing industries; like plastic, textiles, pharmaceuticals, etc.

Petroleum refineries act as a “nodal industries” for synthetic textiles, fertilizers and numerous chemical industries.

Most of the petroleum in India occurs in anticlines and fault traps in the rock formations of the tertiary age. The oil bearing layer is a porous limestone or sandstone through which oil may flow. The intervening non-porous layers prevent the oil from rising or sinking. Petroleum is also found in fault traps between porous and non-porous rocks. Gas usually occurs above the oil because it is lighter than oil.



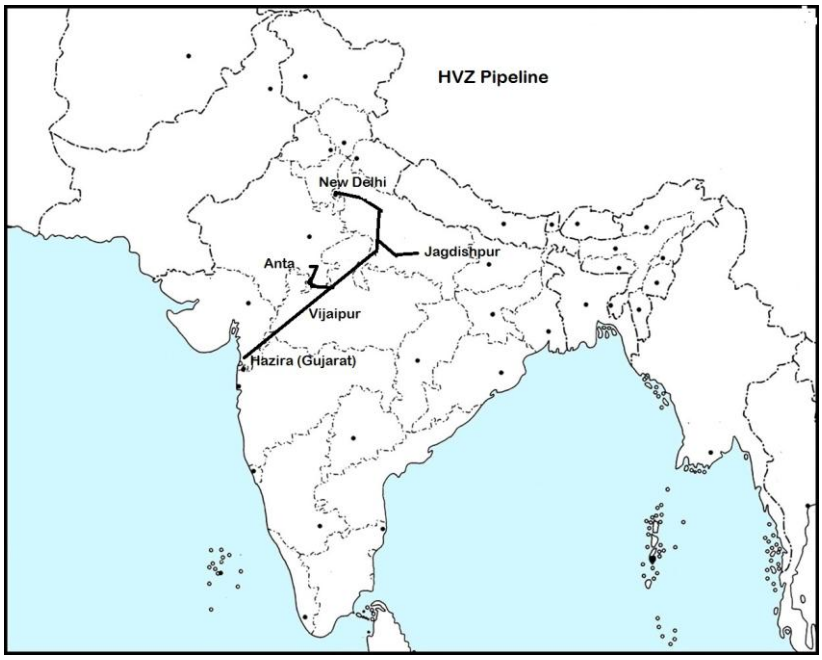
Mumbai High produces about 63% of India’s petroleum, Gujarat produces 18% and Assam 13%. Ankeleshwar is the most important oil field in Gujarat. Assam is the oldest oil producing state of India. Important oil fields of Assam are Digboi, Naharkatiya and Moran-Hugrijan.

Natural Gas

Natural gas is found alongwith or without petroleum. It is used as fuel and also as industrial raw material. Large reserves of natural gas have been discovered in the Krishna-Godavari Basin. Gulf of Cambay, Mumbai High and Andaman Nicobar islands are also important areas with large reserves of natural gas.

The 1700 km long Hazira-Vijaipur-Jagdishpur pipeline links Mumbai High and Bassein with the fertiliser, power and industrial complexes in western and northern India. Natural gas is mainly used by

the fertiliser and power industries. Now-a-days, use of CNG (Compressed Natural Gas) is increasing as vehicle fuel in the country.



Electricity

Electricity is generated mainly by two methods;

1) Hydro electricity- it is generated by fast flowing waterwhich is a renewable source. India has number of multi-purpose projects like the bhakra nangal ,damodar valley corporation etc.
2) Thermal electricity- it is generated by using coal,petroleum, nd natural gas. There are over 310 thermal power stations in india.

Non-conventional Sources of Energy

Rising prices of oil and gas and their potential shortages have raised uncertainities about the securities of energy supply in future, which in turn has serious repercussions on the growth of the national economy. Moreover, increasing use of fossil fuels also causes serious environmental problems. Hence, there is a pressing need to use renewable energy sources like solar energy, wind, tide etc.

Nuclear Energy: Nuclear energy is obtained by altering the structure of atom. When the structure of an atom is altered, too much energy is released in the form of heat. This heat is utilised to generate electric power. Uranium and Thorium are used for generating atomic power. These minerals are available in Jharkhand and the Aravalli ranges of Rajasthan. The Monazite sand of Kerala is also rich in Thorium.

Solar Energy: India is a tropical country. It has enormous possibilities of tapping solar energy. Photovoltaic technology is used to convert solar energy into electricity. The largest solar plant of India is located at Madhapur near Bhuj. Solar energy holds great promises for the future. It can help in minimizing the dependence on firewood and animal dung cakes in rural areas. This will also help in conservation of fossil fuels.

Wind Power: India now ranks as a “Wind Super Power” in the world. The wind farm cluster in Tamil Nadu (from Nagarcoil to Madurai) is the largest cluster in India. Andhra Pradesh, Karnataka, Gujarat, Kerala, Maharashtra and Lakshadweep are also important centres of wind power production.

Biogas: Biogas can be produced from shrubs, farm waste, and animal and human waste. Biogas is more efficient than kerosene, dung cake and charcoal. Biogas plants can be set up at municipal, cooperative and individual levels. The gobar gas(produce using cattle dung) plants provide energy and also manure. these provide twin benefits to the farmer in the form of energy and improved quality of manure.

Tidal Energy: Floodgate dams are built across inlets(an arm off to a larger body of water). The water flows into the inlet during high tide and gets trapped when the gate is closed. Once the tide recedes, the gates are opened so that water can flow back to the sea. The flow of water is used to run the turbine to generate electricity. A 900 mw tidal energy power plant is set up by the National Hydropower Corporation in the Gulf of Kuchchh.

Geo Thermal Energy: We know that the inside of the earth is very hot. At some places, this heat is released on the surface through fissures(a long narrow opening). Groundwater in such areas becomes hot and rises up in the form of steam. This steam is used to drive turbines. Two experimental projects have been set up in India to harness geothermal energy. They are; the Parvati valley near Manikarn in Himachal Pradesh and the Puga Valley in Ladakh.

Conservation of energy resources

Energy consumption is increasing and continuous depletion of energy resources. In this background there is immediate need to develop a sustainable path of energy development. promotion of energy conservation and increased use of renewable energy resources are the twin planks of sustainable energy.

India is presently one of the least energy efficient countries in the world. We have to adopt a cautious approach for the judicious use of limited energy resources.

For eg- as concerned citizens we can do our bit by using public transport systems instead of individual vehicles, switching off electricity when not in use, using power- saving devices and using non-conventional sources of energy. After all, energy saved is energy produced.