Power Resources: Both the domestic and the industrial sectors need power. Power or energy plays a vital role in our lives. We also need power for industry, agriculture, transport, communication and defense. Power resources may be broadly categorized as conventional and non- conventional resources.

Conventional sources: Conventional sources of energy are those which have been in common use for a long time. Firewood and fossil fuels are the two main conventional energy sources. Mineral fuels are essential for generating power. They are also known as fossil fuels or energy resources.

Firewood: It is widely used for cooking and heating. Remains of plants and animals which were buried under the earth for millions of years got converted by the heat and pressure into fossil fuels. Fossil fuel such as coal, petroleum and natural gas are the main sources of conventional energy.

Coal: This is the most abundantly found fossil fuel. It is used as a domestic fuel, in industries such as iron and steel, steam engines and to generate electricity. Electricity from coal is called thermal power. The leading coal producers of the world are china, USA, Germany, Russia, South Africa and France. The coal producing areas of India are Jharkhand, West Bengal, Orissa, Chhattisgarh, Telangana and Maharashtra. The coal we use today was formed million of years ago. They are transformed remains of giant ferns and swamps that were buried under the layers of earth. The leading coal producers of the world are China, USA, Germany, Russia, South Africa and France.

Petroleum: The petrol that keeps your car running began as thick liquid called petroleum. It is found between the layers of rocks and is drilled from oil fields located in off- shore and coastal areas. Petroleum is found as crude oil trapped in between layers of sedimentary rocks. This is then sent to refineries which process the crude oil and produce a variety of products like diesel, petrol, kerosene, wax, plastic and lubricants. Petroleum and its derivatives are called black gold. As they are very valuable, they are also called black gold and liquid gold. The chief petroleum producing countries are Iran, Iraq, Saudi Arabia and Qatar. The leading producers in India are Digboi in Assam, Bombay high in Mumbai and the deltas of Krishna and Godavari rivers.

Natural Gas: Natural gas is found with petroleum deposits and is released when crude oil is brought to the surface. It can be used as a domestic and industrial fuel. Russia, Norway, UK and the Netherlands are the major producers of natural gas. In India Jaisalmer, Krishna Godavari delta, Tripura and some areas off shore in Mumbai have natural gas resources. Compressed natural gas (CNG) is an eco-friendly automobile fuel. It causes less pollution than petrol and diesel.

Non- Conventional Sources of Energy: Non- conventional sources such as solar energy, wind energy, tidal energy which are continuously renewed by natural processes. These resources are non-polluting.

Solar energy: Solar energy trapped from the sun can be used in solar cells to produce electricity. Many of these cells are joined into solar panels to generate power for heating and lighting purpose. Solar energy is also used in solar heaters, solar cookers, solar dryers besides being used for community lighting and traffic signals. This has resulted in the depletion of fossil fuels at a disturbing rate.

Wind energy: Wind is a pollution free, inexhaustible source of energy. In this, the kinetic energy of wind is converted into electrical energy of wind is converted into

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electrical energy through turbines. Wind mills have been used for grinding grain and lifting water since times immemorial. In modern time wind mills, the high speed winds rotate the wind mill which is connected to a generator to produce electricity. Wind farms are found in Netherlands, Germany, Denmark, UK, USA and Spain are noted for their wind energy production.

Nuclear power: Nuclear power is obtained from energy stored in the nuclei of atoms of naturally occurring radio actives elements like uranium and thorium. These fuels undergo nuclear fission in nuclear reactors and emit power. The greatest producers of nuclear power are USA and Europe. In India Rajasthan and Jharkhand have large deposits of uranium. Thorium is found in large quantities in the monazites sands of Kerala. The nuclear power stations in India are located in kalpak am in Tamil Nadu, Tarapur in Maharashtra, Ranapratap Sagar near Kota in Rajasthan, Narora in Uttar Pradesh and Kaiga in Karnataka.

Geothermal Energy: Heat energy obtained from the earth is called geothermal energy. The temperature in the interior of the earth rises steadily as we go deeper. Sometimes this heat energy may surface itself in the form of hot springs. This heat energy can be used to generate power. The hot water that gushes out through natural geysers or geothermal spring is used to produce thermal energy. Geothermal energy in the form of hot springs has been used for cooking and heating. USA has the world's largest geothermal power plants followed by New Zealand, Iceland, Philippines and Central America. In India, geothermal plants are located in Manikaran in Himachal Pradesh and Puga valley in Ladakh.

Tidal Energy: Energy generated from tides is called tidal energy. Tidal energy can be harnessed by building dams at narrow openings of the sea. During high tide the energy of the tides is used to turn the turbine installed in the dam to produce electricity. Russia, France and the Gulf of Kutch in India have huge tidal mill farms.

Biogas: Organic waste such as dead plant and animal material, animal dung and kitchen waste can be converted into a gaseous fuel called biogas. The organic wastes are decomposed by bacteria in biogas digesters to emit biogas which is essentially a mixture of methane and carbon dioxide. Biogas is an excellent fuel for cooking and lighting and produce huge amount of organic manure.

Hydroelectric power: Rain water or river water stored in dams is made to fall from heights. The falling water flows through pipes inside the dam over turbine blades placed at the bottom of the dam. The moving blades then turn the generator to produce electricity. This is called hydro electricity. The water discharged after the generation of electricity is used for irrigation. One fourth of the world's electricity is produced by Hydro power. The leading producers of hydro power in the world are Paraguay, Norway, brazil, and china, some important hydro power stations in India are Bhakra Nangal, Gandhi Sagar, Nagarjunsagar and Damodar valley projects.

Save Energy: While we should make every effort to conserve untapped energy resources, it is equally important not to waste the energy that is already harnessed. It is our duty to use it safely.

It will make a difference to the world environment.

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