**Conventional and Non-Conventional Sources of Energy**

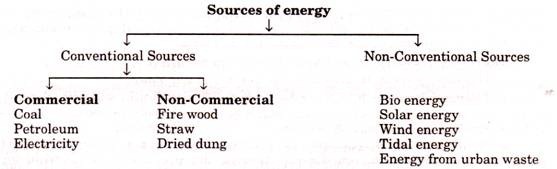
Energy is one of the most important component of economic infrastructure.

It is the basic input required to sustain economic growth. There is direct relation between the level of economic development and per capita energy consumption.

Simply speaking more developed a country, higher is the per capita consumption of energy and vice-versa. India’s per capita consumption of energy is only one eighth of global average. This indicates that our country has low rate of per capita consumption of energy as compared to developed countries.

**Two Main Sources of Energy:**

**The sources of energy are of following types:**

[](https://www.economicsdiscussion.net/wp-content/uploads/2014/12/clip_image0027.jpg)

**1. Conventional Sources of Energy:**

These sources of energy are also called non renewable sources. These sources of energy are in limited quantity except hydro-electric power.

**These are further classified as commercial energy and non-commercial energy:**

**Commercial Energy Sources:**

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These are coal, petroleum and electricity. These are called commercial energy because they have a price and consumer has to pay the price to purchase them.

**(a)** **Coal and Lignite:**

Coal is the major source of energy. Coal deposits in India are 148790 million tonnes. Total lignite reserves found at Neyveli are 3300 million tonnes. In 1950-51, annual production of coal was 32 million tonnes. In 2005-06, annual production of coal was 343 million tonnes.

Lignite production was 20.44 million tonnes in 2005-06. According to an estimate, coal reserves in India would last about 130 years. India is now the fourth largest coal producing country in the world. Coal deposits are mainly found in Orissa, Bihar, Bengal and Madhya Pradesh. It provides employment to 7 lakh workers.

**(b)** **Oil and Natural Gas:**

In these days oil is considered as the most important source of energy in India and the world. It is widely used in automobiles, trains, planes and ships etc. In India it is found in upper Assam, Mumbai High and in Gujarat. The resources of oil are small in India.

In 1950-51, the total production of oil in India was 0.3 million tonnes. It increased to 32.4 million tonnes in 2000-01. Despite tremendous increase in oil production. India still imports 70% of has oil requirements from abroad. In 1951, there was only one oil refinery in Assam.

After independence 13 such refineries were set up in public sector and their refining capacity was 604 lakh tonnes. After implementation of economic reforms, private refineries are also engaged in oil refining. As per current rate of consumption, oil reserves in India may last about 20 to 25 years.

**Natural gas has been the most important source of energy since last two decades. It can be produced in two ways:**

(i) With petroleum products as associated gas.

(ii) Free gas obtained from gas fields in Assam, Gujarat and Andhra Pradesh.

It is used in fertilizer and petro-chemical plants and gas based thermal power plants. Total production of natural gas was 31.96 billion cubic metre in 2003-04.

**(c)** **Electricity:**

Electricity is the common and popular source of energy. It is used in commercial and domestic purposes. It is used for lighting, cooking, air conditioning and working of electrical appliances like T.V., fridge and washing machine.

In 2000-01 agriculture sector consumed 26.8%, industrial sector 34.6% and 24% of electricity was used for domestic purposes and 7% was used for commercial purpose. Railways consumed 2.6% and miscellaneous consumption was 5.6%.

**There are three main sources of power generation:**

1. Thermal Power

2. Hydro-electric power

3. Nuclear Power

**1. Thermal Power:**

It is generated in India at various power stations with the help of coal and oil. It has been a major source of electric power. In 2004-05, its share in total installed capacity was 70 percent.

**2. Hydro electric Power:**

It is produced by constructing dams over overflowing rivers. For example Bhakra Nangal Project, Damodor Valley Project and Hirakund Project etc. In 1950-51, installed capacity of hydro-electricity was 587.4 MW and in 2004-05, it was 19600 MW.

**3. Nuclear Power:**

India has also developed nuclear power. Nuclear Power plants use uranium as fuel. This fuel is cheaper than coal. India has nuclear power plants at Tarapur, Kota (Rajasthan) Kalapakam (Chennai) Naroura (UP). Its supply accounts for only 3 percent of the total installed capacity.

**2. Non-Conventional Sources of Energy:**

Besides conventional sources of energy there are non-conventional sources of energy. These are also called renewable sources of energy. Examples are Bio energy, solar energy, wind energy and tidal energy. Govt. of India has established a separate department under the Ministry of Energy called as the Department of Non-conventional Energy Sources for effective exploitation of non-conventional energy.

These sources include fuel wood, straw and dried dung. These are commonly used in rural India. According to an estimate, the total availability of fuel wood in India was only 50 million tonnes a year. It is less than 50% of the total requirements. In coming years, there would be shortage of fire wood.

Agricultural wastes like straw are used as fuel for cooking purposes. According to one estimate agricultural waste used for fuel might be 65 million tonnes. Animal dung when dried is also used for cooking purposes. Total animal dung production is 324 million tonnes out of which 73 million tonnes are used as fuel for cooking purposes. The straw and dung can be used as valuable organic manure for increasing fertility of soil and in turn productivity.

**The various sources are given below:**

**1. Solar Energy:**

Energy produced through the sunlight is called solar energy. Under this programme, solar photovoltaic cells are exposed to sunlight and in the form of electricity is produced. Photovoltaic cells are those which convert sun light energy into electricity. In year 1999-2000, 975 villages were illuminated through solar energy. Under Solar Thermal Programme, solar energy is directly obtained. Sunlight is converted into thermal power. Solar energy is used for cooking, hot water and distillation of water etc.

**2. Wind Energy:**

This type of energy can be produced by harnessing wind power. It is used for operating water pumps for irrigation purposes. Approximately 2756 wind pumps were set up for this purpose. In seven states, wind power operated power houses were installed and their installed capacity was 1000 MW. India has second position in wind power energy generation.

**3. Tidal Energy:**

Energy produced by exploiting the tidal waves of the sea is called tidal energy. Due to the absence of cost effective technology, this source has not yet been tapped.

**4. Bio Energy:**

This type of energy is obtained from organic matter.

**It is of two kinds:**

**(i)Bio Gas:**

Bio Gas is obtained from Gobar Gas Plant by putting cow dung into the plant. Besides producing gas this plant converts gobar into manure. It can be used for cooking, lighting and generation of electricity. 26.5 lakh bio gas plants had been established by the year 2003-04. They produce more than 225 lakh tonnes of manure. About 1828 large community bio gas plants have been established in the country.

**(ii)Bio Mass:**

It is also of a source of producing energy through plants and trees. The purpose of bio mass programme is to encourage afforestation for energy. So that fuel for the generation of energy based on gas technique and fodder for the cattle could be obtained, 56 MW capacity for the generation of bio mass energy has been installed.

**5. Energy from Urban Waste:**

Urban waste poses a big problem for its disposal. Now it can be used for generation of power. In Timarpur (Delhi) a power Ration of 3.75 capacity has been set up to generate energy from the garbage.