

RENEWABLE ENERGY SOURCES

INTRODUCTION

Any physical activity in this world, whether carried out by human beings or by nature, is caused due to the flow of energy in one form or the other. The word 'energy' itself is derived from the Greek word 'en-ergon', which means 'in-work' or 'work content'. The work output depends on the energy input. Energy is one of the major inputs for the economic development of any country. In the case of the developing countries, the energy sector assumes a critical importance in view of the ever increasing energy needs requiring huge investments to meet them. Energy can be classified into several types based on the following criteria:

- Primary and Secondary energy
- Commercial and Non commercial energy
- Renewable and Non-Renewable energy
- Conventional and Non-conventional energy

Primary and Secondary Energy

Primary energy sources are those that are either found or stored in nature. Common primary energy sources are coal, oil, natural gas, and biomass (such as wood). Other primary energy

sources available include nuclear energy from radioactive substances, thermal energy stored in earth's interior, and potential energy due to earth's gravity. The major primary and secondary energy sources are Primary energy sources are costly converted in industrial utilities into secondary energy sources; for example coal, oil or gas converted into steam and electricity. Primary energy can also be used directly. Some energy sources have non energy uses, for example coal or natural gas can be used as a feedstock in fertilizer plants.

Commercial Energy and Non Commercial Energy

Commercial Energy

The energy sources that are available in the market for a definite price are known as commercial energy. By far the most important forms of commercial energy are electricity, coal and refined petroleum products. Commercial energy forms the basis of industrial, agricultural, transport and commercial development in the modern world. In the industrialized countries, commercialized fuels are predominant source not only for economic production, but also for many household tasks of general population. Examples: Electricity, lignite, coal, oil, natural gas etc.

Non-Commercial Energy

The energy sources that are not available in the commercial market for a price are classified as non-commercial energy.

Non-commercial energy sources include fuels such as firewood, cattle dung and agricultural wastes, which are traditionally gathered, and not bought at a price used especially in rural households. These are also called traditional fuels. Non-commercial energy is often ignored in energy accounting. Example: Firewood, agro waste in rural areas; solar energy for water heating, electricity generation, for drying grain, fish and fruits; animal power for transport, threshing, lifting water for irrigation, crushing sugarcane; wind energy for lifting water and electricity generation.

Conventional and Non Conventional Energy

Conventional energy resources which are being traditionally used for many decades and were in common use around oil crisis of 1973 are called conventional energy resources, e.g., fossil fuel, nuclear and hydro resources. Non-conventional energy Non-conventional energy resources which are considered for large 1973, are called non-conven

Energy Consumption and Standard Of Living:

The energy consumption of a nation can be broadly divided into the following areas or sectors depending on energy-related activities. These can be further s

- Domestic sector (houses and offices including commercial buildings)
- Transportation sector
- Agriculture sector

Energy Pricing in India

Price of energy does not reflect true cost to society. The basic assumption underlying efficiency of market place does not hold in our economy, since energy prices are undervalued and energy wastages are not taken seriously.

Pricing practices in India like many other developing countries are influenced by political, social and economic compulsions at the state and central level.

More often than not, this has been the foundation for energy sector policies in India. The Indian energy sector offers many examples of cross subsidies e.g., diesel, LPG and kerosene being subsidized by petrol, petroleum products for industrial usage and industrial, and commercial consumers of electricity subsidizing the agricultural and domestic consumers.

Coal

Grade wise basic price of coal at the pithead excluding statutory levies for run-of-mine (ROM) coal are fixed by Coal India Ltd from time to time. The pithead price of coal in India compares favorably with price of imported coal. In spite of this, industries still import coal due its higher calorific value and low ash content.

d in serious distortions in prices, as they do not reflect economic costs in many cases

Oil

As part of the energy sector reforms, the government has attempted to bring prices for many of the petroleum products (naphtha, furnace oil, LSHS, LDO and bitumen) in line with international prices. The most important achievement has been the linking of diesel prices to international prices and a reduction in subsidy. However, LPG and kerosene, consumed mainly by domestic sectors, continue to be heavily subsidized. Subsidies and cross-subsidies have resulted

Natural Gas

The government has been the sole authority for fixing the price of natural gas in the country. It has also been taking decisions on the allocation of gas to various competing consumers. The gas prices vary from Rs 5 to Rs.15 per cubic meter.



FACULTY OF ENGINEERING & TECHNOLOGY