
Types of Renewable Energy Sources

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Introduction:-

Renewable energy, frequently referred to as clean energy, comes from natural sources or processes that are constantly replenished. Sunshine or wind keep shining and blowing, even if their availability depends on time and weather.

Despite the heavy costs and environmental risks that are involved in the production, storage and distribution of energy, a lot of it is wasted. The non-exhaustible sources of energy like solar energy, hydroelectricity, wave and tidal energy, wind energy and bioenergy from biomass or biogas are known as renewable sources of energy.

What is Renewable Energy?

Renewable energy is energy that is gathered from renewable resources. which are naturally refilled on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy often supplyenergy in four important areas: electricity generation, air and water heating/cooling, transportation, and rural energy services.

Different Types of Renewable Energy Sources

There are the resources that are replenished through rapid natural cycles.Common examples of such resources are:

- a) Oxygen in the air, which is replenished through photosynthesis.
- b) Fresh water, which is replenished through the water cycle.
- c) All biological products (food, fish's timberetc.) which are replenished through natural cycles of growth and reproduction.
- d) Solar energy is also considered as renewable as on a human time scale and it inexhaustible. It is expected that will last at least6.5 billion years.
- e) Some other renewable resources that can be renewed that can be renewed (hours to several decades) through natural processesincludeforests, grassland grasses. Wildanimals,fresh air and fertile soil. However, potentiallyrenewable resources can be depleted whenresources depleted utilization rate exceeds the natural replacement rate.

There are different types of energies that are considered renewable energies namely solar energy, wind energy, tidal energy, hydroelectric energy, geothermal energy, biomass energy, etc.

1) Solar Energy:-

Solar energy has been tapped in various ways. Simple devices that trap the heat and aid in drying and cooking food have been widely used. At a larger scale , solar energy is converted into electrical energy using **what** are called photovoltaic(PV) cells or solar cells. Solar cells contain thin semiconductors that create the electricity. As each solar cells or solar cells. Solar cells contain thin semiconductors that create the electricity. As each solar cell produces only a small quantity of electricity, many are wired together to form solar panels.Depending on the amount of electricity that is required; thesize of the panel wouldvary. Despite lower efficiency during cloudy days and the higher costs of installation, solar cells are gaining popularity throughout the world as they are the least harmful to the environment. Onceestablished, a solar energy unit may last 20-40year.

2) Biomass Energy:-

All type of biological substance like plant products (wood, crop, algae and aquatic plants), their residues (straw, husk, sawdust, cow dung, animal droppings) and also waste material like garbage and night soil are collectively known as biomass.

Biomass is used as a source of energy in many parts of the world. Burning of the biomass produces heat energy known as bioenergy. It is obtained through the oxidation of biomass. The residue left after burning the biomass is used as manure in agriculture fields. Burning of wood causes depletion of forest cover, which in turn leads to the accumulation of carbon dioxide in the atmosphere, Greenhouse Effect and soil erosion.

These problems are being tackled now days by a wide range of social forestry or energy plantation themes. Plants like eucalyptus, acacia and cassia are planted widely to be used as fuel wood.

3) Wind Energy:-

Wind has been used as means to spin turbines and generate electricity. More simply, the use of wind mill has helped in lifting water for various purposes. During the year 2002, around 35 million people on the earth met their residential needs through wind-generated power. Nearly three-fourths of the world's wind power is used in Europe, especially in countries like Germany, Spain and Denmark. Many states in India have also installed large number of windmills to complement the energy supplies to industries. While windmills are not polluting, they take away large spaces. They have destroyed the scenic beauty of vast landscapes such as those in southern India. (Those who have traveled to Kanyakumari from Tirunelveli by train during light hours cannot miss seeing one good example.) Windmills across flyways of migratory birds and birds of prey have interfered with their flight and killed them.

4) Hydroelectric Energy:-

While wastage has to be reduced, viable alternatives to non-renewable energy generation have to be explored more seriously. One form of renewable energy generation that has been widely adopted is hydroelectricity. Water has been used to run turbines and generate electricity. While this method is hailed for its higher efficiency and lower CO₂ emission when in operation, the environmental impacts on land and water have been often severe. Large dams have destroyed habitats of wildlife, displaced people and agriculture. They have also placed undue stress on the earth and evoked fears that a collapse of the dam could destroy life downstream. Streams and rivers that have been converted into reservoirs and lakes by damming have destroyed aquatic life extensively. The decay of organic matter underwater due to the dam has the potential of emitting large volumes of CO₂.

5) Ocean (Tidal) Energy:-

In some countries, tidal energy is also used to rotate turbines and generate electricity. France was the first country to construct a major tidal electricity generation plant.

In India, places like the Gulf of Kutch, Cambay and Sundarbans are exploited for the most prospective tidal energy harnessing sites. Sea shores near Lakshadweep and the Andaman and Nicobar Islands are also found to depth of 1000mm near the shore. In fact, a one MW plant for Lakshadweep Island has already been designed.

6) Geothermal Energy:-

This is the heat of the interior of the earth present at volcanic regions, geysers or hot springs. This is utilized to generate electricity. Exploration, for the identification of prospective sites of geothermal energy is to be undertaken. Presently, nearly 350 geothermal springs have been identified in India.

Advantages and Disadvantages of Renewable Energy Sources

Renewable Energy Advantages:-

- The renewable energies are secure, plentiful, as well as hygienic to employ when contrasted toward fossil fuels
- Renewable energies supply the base for energy freedom
- Multiple types of renewable energy exist
- Renewable energy is a technology as a substitute for a fuel
- These energy resources are stable

Disadvantages:-

- Some type of renewable energy sources is location-based and commercially feasible
- Some types of energy sources require a huge space
- These energy sources cause pollution
- Renewable energies repeatedly need funding for making them reasonable

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