

India is one of the nations with the highest renewable energy production. Renewable energy accounts for 34.6% of the total installed power capacity in the electricity industry.

As of 31 March 2019, large hydro-installed capacity amounted to 45,399 GW, contributing 13% of the total energy capability

The remaining renewable energy sources represented 22% of the total installed capacity (77,641 GW)

Renewable Energy in India

What is Renewable Energy?

Renewable energy is energy from renewable resources that are naturally replenished on a human scale, such as sunlight, wind, rain, tides, waves and geothermal heat.

Why Renewable Energy?

Climate change and global warming issues, combined with a steady decline in the cost of some renewable energy materials, such as wind turbines and solar panels, drive enhanced use of renewable energy.

Below is the list of renewable energies:

Hydropower Energy:

Hydroelectric power generates electricity using the kinetic energy of moving water.

Electricity generation is called hydroelectricity or hydroelectric power by using the force of falling water. It's cheaper than nuclear or thermal energy.

Dams are constructed to store water at a greater rate; falling to rotate electricity-generating turbines.

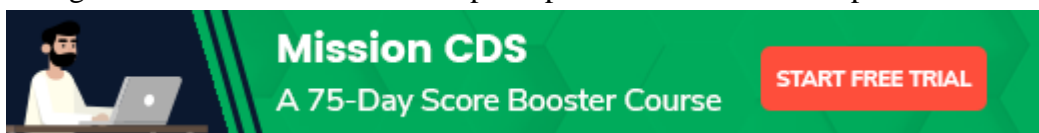
One of the biggest benefits of hydropower is that it is comparatively inexpensive and clean energy source once the dam is constructed and turbines become operational.

Hydropower also has some disadvantages; the building of the dam seriously disturbs and damages the natural habitats and some of them are lost forever.

Solar Energy:

Photovoltaic (PV) cells frequently known as solar cells can convert solar energy directly into electrical power (direct present, DC).

Photovoltaic cells consist of silicon and other materials. It causes electrons to be ejected when sunlight hits the silicon atoms. This principle is referred to as the 'photoelectric effect'.



By using solar cells, direct solar energy can be used as heat, light and electricity.

Direct use of solar energy can be used in three kinds of structures:

- (a) passive
- (b) active
- (c) photovoltaic by means of different devices.

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Passive Solar Energy:

As you understand, some of the oldest uses of solar energy have been passive in nature, such as evaporating sea water for salt production and drying up food and clothing.

In reality, for these purposes, solar energy is still being used. The latest passive uses of solar energy are for cooking, heating, cooling and household and building daylighting.

Active Solar Energy:

Active solar heating and cooling systems are based on solar collectors that are generally installed on towers.

In order to supply the captured heat, such systems also require pumps and engines to move the liquids or blow air by a fan.

There are several distinct active solar heating systems available. These systems are mainly used to provide warm water, mainly for national use.

Tidal Energy:

Tidal power projects try to harness tides ' energy as they flow in and out. A tidal energy generation site's primary requirement is that the mean tidal range must exceed 5 meters.

Building a dam across the entrance to a bay or estuary that creates a reservoir harnesses the tidal power.

Initially, water is prevented from entering the bay as the tide increases. Then when tides are high and water is enough for the turbines to operate, the dam is opened and water flows through it into the reservoir (the bay), turning turbine blades and producing electricity.

Once again, when the reservoir (the bay) is filled, the dam is closed, the flow stops, and when the tide (ebb tide) drops, the water level in the reservoir is greater than in the ocean.

The dam is then opened to operate the turbines (which are reversible), producing electricity as the water is released from the reservoir.

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Wind Energy:

Wind power production in India started in the 1990s and has risen considerably in recent years.

Although a comparative newcomer to the wind industry compared to Denmark or the US, national wind energy assistance has resulted in India to become the fourth biggest wind power installed in the globe.

As of 30 June 2018, the installed wind energy capacity in India was 34,293 MW, primarily spread over Tamil Nadu (7,394 MW), Maharashtra (4,369.40 MW), Gujarat (3,454.30 MW), Rajasthan (2,784.90 MW), Karnataka (2,318.20 MW), Andhra Pradesh (746.20 MW) and Madhya Pradesh (423.40 MW) Wind energy accounts for 10% of India's total installed capacity.

Ministry of New and Renewable Energy

The Ministry was set up in 1992 as the Ministry of Non-Conventional Energy Sources.

The Ministry is mainly responsible for

1. Research & Development,
2. Intellectual Property Protection, and
3. International Cooperation, Promotion, and Coordination in renewable energy sources such as wind power, small hydro, biogas & solar power.

Initiatives by the government

- Jawaharlal Nehru National Solar Mission (JNNSM)
- Solar Lantern Programme
- Remote Village Lighting Programme
- National Offshore Wind Energy Authority
- National Biogas and Manure Management Programme (NBMMP)
- Solar thermal energy Demonstration Programme
- National Biomass Cookstoves Initiative (NBCI)



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