

# OVER VIEW OF NON CONVENTIONAL SOURCE OF ENERGY AND ITS APPLICATION

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**Abstract:** *Nonconventional energy or renewable sources of energy is defined as the sources of energy that are exhaustible and being made continuously in nature. Coal, oil and gas sorts of atomic energy are the standard sources compress the fossil fuels. Uranium is a gas sorts of atomic energy, whereas the nonconventional sources like daylight, wind, rain, tides, and energy heat, that are renewable. The event and progress of grouping have connected with energy sources, quite a lot of countries throughout the globe have engaged themselves in looking and developing non-conventional energy sources that may be terribly essential to sustain the life cycle of a person. Actually consumption of energy is directly proportional to the progress of the grouping. With ever growing population, improvement within the living commonplace of mankind, industrialization of developing countries, the world demand for energy is anticipated to extend considerably within the close to future. The energy crisis that begin in 1973 caused oil supplies to decrease and costs to rise usurious. This crisis forced developing countries to cut back and hold over necessary development programs, so that they may pay for oil to stay their economies operational. It created the urgent necessity to look for and develop energy sources, like different fossil fuels i.e., coal, gas, atomic energy, and renewable energy resources. India has as well taken sure initiatives during this read. In this paper, we mostly study about review of concerning numerous non-conventional energy sources and their current standing and usage.*

**Keywords:** *Non-Conventional Energy, Solar energy, Wind energy, Bio energy, Hydro energy, Geothermal energy, Wave and tidal energy.*

## 1. INTRODUCTION

Energy is the most important and most collective measure of all kinds work by human beings and nature. Everything what happen the world is the term of flow of energy in one of its forms [1]. Energy is the major input to drive the life cycle and recover it. Energy consumption has closely linked with the progress of the mankind. There are necessary for future to improvement in the living standard of the mankind, industrialization of the developing countries and the global demand for energy will increase with every rising population [2]. The development of infrastructure plays a significant role to maintain economic growth. The upward countries would countenance such impact of the energy crisis [3]. The power sector is a example of the major significant constituent of infrastructure. Basically, India is dependent on three types of conventional sources of energy like thermal, hydro and nuclear.

The rank of India is sixth in the world in total energy conservation, whereas more than 70% of its primary energy desires are being met through imports, mainly in the form of crude oil and natural gas. In the matter of power generation in the country, India has increased installed power capacity from 1362 MW to over 112,058 MW since independence and electrified over 500,000 villages [4]. This realization is remarkable but not sufficient. It is a matter of concern that 44% of households do not have access to the electricity (Census 2001) and as many as 80,000 villages are yet to be electrified. The electricity supply is not even adequate for those who have been connected. The country still encounters max out and energy shortage of 7.7% and 12.3% respectively (Up to Aug '05). The annual per capita utilization of 580 Kwh is amongst the lowest in the world. The Ministry of Power has now drawn a road map to make sure 'power on demand' by 2012. The probable stipulate as per 16th Electric Power Survey requires an addition of 1,00,000 MW. In other words, the achievements of more than five decades need to be simulated in the next decade. This requires property of Rs.8, 00,000 corers. The task is discouraging but not impossible. India has a huge hydro potential of 150,000 MW out of which only 17% has been tapped so far. Then there are coal reserves to last for more than 200 years along with other usable energy reserves such as oil and gas etc. Even the probable of renewable is 82,000 MW. Till now, the total installed capability based on these sources is only about 6422 MW consisting of 3595 MW wind, 1705 MW small hydro, 750 MW biomass, 264 KW solar, 66 MW gasifies and 42 MW from built-up/industrial waste energy. This constitutes only 7.8% of total installed

capacity in the country. The MOP (Ministry of Power) has drafted New and Renewable Energy Policy Statement 2005 issuing guidelines to indigenously develop new and renewable energy technologies, products & services, at par with international standards, stipulation, and performance parameters for deployment in a manner so as to arrive at an optimal fuel-mix that most successfully meets the overall concerns of the country. To ensure included development, a Coordination Committee for Power has been constituted for close coordination amongst the concerned Ministries to purposeful on issues pertaining to generation programmed, evacuation schemes, operational issues and grid related problems. India has pioneered in many administrative actions of renewable energy promotion, such as;  $\frac{3}{4}$  Electricity regulatory commission within the liberalized market, 1991  $\frac{3}{4}$  Mandatory environmental audits for power projects, 1992  $\frac{3}{4}$  Energy conservation bill, 2000  $\frac{3}{4}$  Renewable energy promotion bill, 2005.

## 2. NONCONVENTIONAL SOURCES OF ENERGY

Another name of Non-conventional sources of energy is Renewable energy. Renewable sources are continuously replenished by natural processes i.e. solar energy, wind energy, bio-energy- bio-fuels grown sustainably, hydropower etc., are some of the examples of renewable energy sources [5]. A renewable energy system converts the energy found in sunlight, wind, falling-water, sea-waves, geothermal heat, or biomass into a form, we can use such as heat or electricity. Most of the renewable energy comes either directly or indirectly from sun and wind and can never be exhausted, and therefore they are called renewable.

Various forms of renewable energy

- Solar energy
- Wind energy
- Bio energy
- Hydro energy
- Geothermal energy
- Ocean energy

## 3. SOLAR ENERGY

Solar energy is a form of nonconventional energy which comes from the sun, where The Sun's energy comes from nuclear fusion reaction. All we know that, the life of the earth depends on solar energy. The solar energy that falls on India in one minute is sufficient to supply the energy

needs of our country for one day. Man has made very little use of this massive amount of solar energy that reaches the earth. Utilization of solar energy can be dependent through two different routes, as solar thermal route and solar electric (solar photovoltaic) routes. In solar thermal device solar energy can be converted into thermal energy with the help of solar collectors and receivers in solar thermal route [6].

Solar energy applications are as follows:

- Heating and cooling of residential building.
- Solar water heating.
- Solar drying of agricultural and animal products.
- Salt production by evaporation of seawater.
- Solar cookers.
- Solar engines for water pumping.
- Solar electric power generation

#### **4. WIND ENERGY**

Wind Energy is a example of renewable energy. Actual working principle of wind energy is captures the natural wind in our environment and converts the air's motion into mechanical energy. Wind energy describes as a process by which wind is used to generate electricity. Wind turbines are used to convert the kinetic energy in the wind into mechanical power and this mechanical power can also be utilized directly for specific tasks such as pumping water.

Wind energy applications are as follows:

- Mechanical application: mainly (water pumping) Multi-blade windmill used for water pumping [6].
- Electricity generation: Wind turbine is a one type of turbine which vary in size and type. They are commercially available for electricity generation.

#### **5. BIO ENERGY**

Bio energy is a form of renewable energy, where one of many various resources available to help meet our demand for energy. It is derivative from recently living organic materials known as biomass, which can be used to produce transportation fuels, heat, electricity, and products.

Biomass defined as a Bio energy refers to electricity and gas that is generated from organic matter and which can be anything from plants and timber to agricultural and food waste – and even sewage. Bio energy is being used for cooking, mechanical applications, pumping, power generation etc [6]. Industry and businesses use biomass for several purposes including space heating, hot water heating, and electricity generation. Many industrial facilities, such as lumber mills, naturally produce organic waste.

## 6. HYDRO ENERGY

Hydro energy is the form of renewable energy. Hydropower or hydroelectricity refers to the conversion of energy from flowing water into electricity. It is considered a renewable energy source because the water cycle is constantly renewed by the sun. Historically, hydro power firstly use for mechanical milling, such as grinding grains. Now a day's modern hydro plants produce electricity using turbines and generators and there mechanical energy is created when moving water spins rotors on a turbine. This turbine is connected to an electromagnetic generator, which produce electricity when the turbine spins. Hydro plant facilities can be categorized into three sizes, those are large (>30 MW), small (100 kW – 30 MW), or micro (<100 kW). The Ministry has set target of 2100 MW capacity addition during 12th Plan and about 3000 MW during the 13th Plan period which would take the total installed capacity from SHP Projects to about 8500 MW in the year 2021-22 (about 60% of the existing potential) [8].

## 7. GEOTHERMAL ENERGY

Geothermal energy is the heat that comes from the sub-surface of the earth. It is a renewable energy source because heat is continuously produced inside the earth. The use of geothermal heat is for bathing, to heat buildings, and to generate electricity. Geothermal energy applications are as follows: Geothermal Power Generation, Geothermal Direct-Heating, Geothermal Ground Source Heating and Cooling [7].

## 8. OCEAN ENERGY

Ocean energy is an all forms of renewable energy which comes from the sea. Ocean technology is three main types, which are wave, tidal and ocean thermal. The ocean can produce thermal energy from the sun's heat and mechanical energy from the tides and waves. Actually Wave energy is remains pricier than the other ocean technologies. Ocean thermal energy has

many applications, including electricity generation. Electricity conversion systems are three types: closed-cycle, open-cycle, and hybrid.

## 9. CONCLUSIONS

The sustainable economic development and growth of any country have been closely related to the development and security of its energy sectors. With reference to the finite and limited funds of conventional energy sources and their impact on environment, a great prominence should be given to the enlargement of non-conventional energy sectors and its proper utilization for the advantage and betterment of mankind. Such initiatives are also helpful to create many employment opportunities at all levels, especially in rural areas. Therefore, mainstreaming of non-conventional and renewable energy technologies is becoming very essential for the emergent countries. In our country there is great scope for the development of non-conventional and renewable energy sectors. India is the only country where has an exclusive Ministry for New and Non-Conventional Energy Sources. India possesses the largest decentralized solar energy programme, the second largest biogas and improved stove programmes, and the fifth largest wind power programme in the world.

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