

# RENEWABLE ENERGY RESOURCES AND THEIR STATUS

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## Abstract

Renewable energy is now days considered a more desirable resource of fuel than nuclear power due to the absence of risk and disasters on earth. In this paper, we discuss alternative technologies and methods for enhancing renewable energy deployment and energy use efficiency. A majority of the communities around the world deals with heavily on oil, natural gas and coal for their energy needs. This review article discusses the types and advantages or disadvantages of renewable energies. Therefore based on the benefits of these energy resources, instead of, fossil fuels will be a good solution for the control of the environmental, social and economic problems.

**Keywords:** Renewable Energy, energy resources, renewable, fissile fuel.

## 1. Introduction

Renewable energy resources have considerable potential to contribute to the economic, social and environmental energy of world. Renewable energy is a fundamental and growing Part of the world on going energy transformation technique. Many countries have started to install facilities that use renewable energy sources for power generation and their other needs. The importance of alternative energy sources comes together with climate change challenges associated with the excessive use

of fossil fuels. Renewable energy sources such as biomass, wind, solar, hydropower, and geothermal can provide sustainable energy services, based on the use of routinely available, indigenous resources. Renewable energy replaces conventional fuels in four distinct areas: power generation, hot water, transport fuels and rural energy uses [1]. Renewable energy sources currently supply somewhere between 15 percent and 20 percent of world's total energy demand. The supply is dominated by traditional biomass, mostly fuel wood used for cooking and heating, especially in developing countries. In general renewable energies are not adaptable to every single community because of two main factors, the distribution of the natural resources that has dependency on the geographical locations and energy-use with its dependency on the culture of individual community. The other limitations are growth rate and infrastructure. Reduction of local and global pollution, lower exploitation of the natural resources in the territory and maintenance of the resilience, integrity and stability of the ecosystem [2,3].

## 2. Renewable energy sources

There are several renewable energy sources that are in use today. Listed below are brief descriptions of these resources.

### 2.1 Hydropower

Hydropower represents one of the oldest and largest renewable power resources. Hydro power is currently the largest renewable energy source for power generation around the world. Hydropower plants convert the energy of flowing water into electricity. It was 340 terawatt-hour (TWh) in 1950 and covered about one-third of the global electricity demand. It increased to 1,500 TWh in 1975 and further to 2,994 in 2005. Developing hydropower is of great importance to alleviate the energy crisis and environmental pollution resulting from the rapid economic growth of China and other countries in the 21st century [4]. Hydropower has several advantages over most other sources generating electrical power. These include a high level of reliability, proven technology, high efficiency, very low operating and maintenance costs, and the ability to easily adjust to load changes. There are three kinds of hydropower generation plants: (i) run-of-river, where the power is generated by the flow of a river, (ii) reservoir, where the power is generated by the release of stored water, and (iii) pumped storage, where stored water is backed up into the reservoir in order to be pumped again.

### 2.1.1 Tidal energy

Tidal energy is special type of energy. Transforming the potential energy in the Water due to a height difference, into kinetic energy, this is then used to generate electricity. The Only difference is that the water Reservoir gets replenished with the tides, instead of rainfall. The Rance Tidal Power Station In France, Is one Of the biggest Tidal power Stations in the world, With an installed capacity of 240MW. Although the tides are very predictable, power generation is not continuous. During Two quarters of the day between low and high tide the basin is filled and no power is

generated. However Tidal plants have a very long lifetime.

### 3. Wind Power

Wind power is produced by the energy of the wind turning aerodynamic blades mounted to a hub. The hub is connected to a shaft that turns a generator. The Main principle of a wind turbine is to convert the kinetic energy in the wind, into usable electricity. All the turbines need in order to function is wind, which is just air in natural motion, and air is everywhere. Wind signifies a free, abundant, and sustainable energy that will not depreciate. It reduces greenhouse gas emissions by using turbines, which produce energy and electricity when moved by the wind, and can reduce electricity costs. The intermittent and unpredictable nature of the wind power would limit its contribution to any region.

### 4. Solar power

From the three last decades, the economic feasibility of solar power for residential, commercial and industrial consumption has been investigated by researchers. Solar power is energy from the sun. Solar energy is energy from sun that is converted into thermal or electrical energy. Solar energy is a radiant light and heat from Sun harnessed using technologies such as solar heating, photo-voltaic, solar thermal energy, solar architecture and artificial photo synthesis. Solar-electric power can be produced either by power plants using the sun's heat or by photovoltaic (PV) technology, which converts sunlight directly to electricity using solar cells. PV technology is more practical for residential use. Solar photovoltaics (PVs) are arrays of cells containing a material, such as silicon, that converts solar radiation into electricity. Today, solar PVs are used in a wide range of applications, from residential rooftop power generation to medium-scale utility level power generation

[5,6]. Solar energy is non-polluting, does not create greenhouse gases, such as oil based energy does, nor does it create waste that must be stored, such as nuclear energy. Solar panels have no moving parts and require very little maintenance beyond regular cleaning. Without moving parts to break and replace, after the initial costs of installing the panels, maintenance and repair costs are very reasonable.

### **5. Geothermal**

Geothermal power plants use high temperatures deep underground to produce steam, which then powers turbines that produce electricity. Geothermal power plants can draw from underground reservoirs of hot water or can heat water by pumping it into hot, dry rock. Geothermal energy, or energy derived from heat coming from the earth's interior, has many different uses. These uses can be grouped into three categories: for heating systems (and direct use), for generation of electricity, and for use in geothermal heat pumps. A geothermal energy plant does not make use of fuel, thus, it is both sustainable and safe for the environment. Emissions of geothermal energy operations are low. These operations neither pollute the air nor contribute to global warming [7]. Geothermal energy is one of the smallest contributors in sustainable energy with an installed capacity of 12.8 GW in 2015.

### **6. Biomass**

Biomass is second to hydropower as a leader in renewable energy production. Wood is still the largest biomass energy resource today, but other sources of biomass can also be used. These include food crops, grassy and woody plants, residues from agriculture or forestry, oil-rich algae, and the organic component of municipal and industrial wastes. Biomass can be burned directly in specially designed power plants, or used to

replace up to 15% of coal as a fuel in ordinary power plants. Biomass burns cleaner than coal because it has less sulfur. Currently the largest biomass fired power plant in the world is the Drax power station in the United Kingdom. It has a total installed capacity of 3960 MW of which 1320 MW is powered using biomass. The main biomass feed-stocks for power are paper mill residue, lumber mill scrap, and municipal waste. Biomass energy is an insufficient source of energy compared to fossil fuels. It is wrong to support the use of all biomass resources, with any conversion technology and for any application.

### **7. Current status of renewable sources**

Growing maturity of the renewable energy market coupled with technology advancements and policy refinement provide an opportunity to develop an energy system that underpins sustainable development objectives. In 2015 the contribution of all renewable energy sources to the global energy mix grew by the largest increment yet particularly in the electricity sector. Renewable power generation capacity grew by 154 gigawatts (GW) an increase of 9.3% over 2014. Most additions were in wind, solar, photovoltaic (PV) and hydropower. Renewable power technologies are often the first choice for expanding, upgrading and modernizing electricity infrastructure around the world. By the end of 2015 countries had established renewable energy targets at the national, state or provincial level with most countries also adopting related policies. Total global final energy mix would rise only slightly over the next 15 years from 18.3% in 2014 to 21% by 2030. Global renewable energy deployment has increased rapidly in recent years and continues to grow at an unprecedented pace particularly in the power sector.

## 8. Conclusion

The present use of natural gas and fossil fuels added with increasing global population has caused the earth's resources to be abused and depleted. Renewable energy technologies could reduce environmental pollution by replacing fossil fuels in the power generation industry and the transportation sector. The effects on the environment are exhausting and threatening to the sustainability of the earth atmosphere. The implementation directory of renewable energy technologies will reduce many of the present atmospheric problems related with the production and use of fossil fuels. Various combinations of renewable technologies should be developed and consistent with the characteristics of the different geographic regions in the world.

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