



# RENEWABLE ENERGY SOURCES AND ITS USE AS ALTERNATE OF FOSSIL FUELS

## KEYWORDS

renewable energy source, fossil fuels, bio mass, geo thermal

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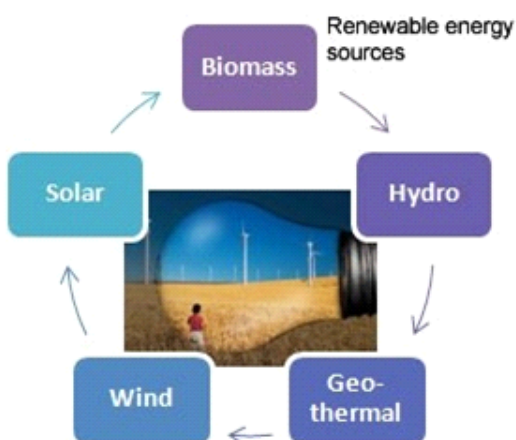
**ABSTRACT** *The electricity requirements of the world including India are increasing at alarming rate and the power demand has been running ahead of supply. It is also now widely recognized that the fossil fuels (i.e., coal, petroleum and natural gas) and other conventional resources, presently being used for generation of electrical energy, may not be either sufficient or suitable to keep pace with ever increasing demand of the electrical energy of the world. Also generation of electrical power by cold based steam power plant or nuclear power plants causes pollution, which is likely to be more acute in future due to large generating capacity on one side and greater awareness of the people in this respect. The recent severe energy crisis has forced the world to develop new and alternative methods of power generation, which could not be adopted so far due to various reasons. The magneto-hydro-dynamic (MHD) power generation is one of the examples of a new unique method of power generation. The other non-conventional methods of power generation may be such as solar cells, fuel cells, thermo-electric generator, thermionic converter, solar power generation, wind power generation, geo-thermal energy generation, tidal power generation etc.*

## INTRODUCTION

Basically the energy sources are two types; they are conventional energy sources like coal, petroleum, natural gas etc. & non-conventional energy sources like solar cells, fuel cells, thermo-electric generator, thermionic converter, solar power generation, wind power generation, geo-thermal energy generation, tidal power generation etc.

Fast depletion of conventional energy sources made us to look after alternate energy sources such as magneto-hydro-dynamic (MHD) power generation and other non-conventional methods of power generation.

### Renewable energy sources:



### 1. Solar Energy:

Solar energy is the most readily available source of energy. It is non polluting and hence helps in lessening the green house effect. India is ideally located for utilization of the radiant energy of the sun. The country receives about 300 clear days in a year. This is equivalent to 5000 trillion KW per year, which is far more than total energy consumption of the country in a year. The solar energy can be easily converted to thermal energy

through solar collector and absorber. This energy is used for cooking/ heating, Drying, Distillation, Electric power generation, Cooling, Refrigeration, Cold storage etc. Some of the solar gadgets and other devices related to thermal energy usage are Solar cooker, Flat plate solar cookers, Concentrating collectors, Solar hot water systems, Solar pond, Solar hot air systems, Solar dryers, Solar timber kins, Solar stills, Solar photovoltaic systems. Solar energy can also be used to meet our electricity requirement. Through Solar Photovoltaic cells, solar radiation gets converted into DC electricity directly. The electricity can either be used as it is or can be stored in the battery.

### 2. Wind energy

Wind energy is the kinetic energy associated with the movement of the atmospheric air. Wind energy is an indirect form of solar energy. About one percent of the total solar radiation that reaches the earth is converted in the atmosphere into the energy of the wind. Wind results from differential heating of the land and its atmosphere by the sun. As the sun heats the different parts of the earth at different rates, air circulates from cold to warm areas producing winds. Though the total quantity of this source is extremely large, it is concentrated in certain regions and can vary a great deal with time at any location. It has been used for hundreds of years for sailing, grinding grain and for immigration. Wind energy systems convert this kinetic energy to more useful form of power. Wind energy systems for irrigation and milling have been in use since ancient times and since the beginning of the 20th centuries it is being used to generate electric power.

### 3. Geothermal Energy

The core of the earth is very hot and it is possible to make use of this geothermal energy. These are areas where there are volcanoes, hot springs and geysers and methane under the water in the oceans and seas. Electric power generation from geothermal energy can be achieved through transferring of heat energy to a working fluid which operates the power cycle. Electric power can also be generated when hot geothermal water or steam is used to operate the turbines directly.

In India, Northwestern Himalayas and the western coast are considered geothermal areas. The Geological Survey of India has already identified more than 350 hot spring sites, which can

be explored as areas to tap geothermal energy. The Puga valley in the Ladakh region has the most promising geothermal field. An experimental 1-KW generator is already in operation in this area.

#### 4. Bio mass energy

Biomass is a renewable energy resource derived from the carbonaceous waste of various human and natural activities. It is derived from numerous sources, including the by products from the timber industry, agriculture crops, raw material from the forest, major parts of household waste and wood. Biomass does not add carbon dioxide to the atmosphere as it absorbs the same amount of carbon in growing as it release when consumed as a fuel. Its advantage is that it can be used to generate electricity with the same equipment or power plants that are now burning fossil fuels. Biomass is an important source of energy and the most important fuel worldwide after coal, oil and natural gas.

Biomass fuels used in India account for about one third of the total fuel used in the country, being the most important fuel used in over 90% of the rural household and about 15% of the urban households.

Instead of burning the loose biomass fuel directly, it is more practical to compress it into briquettes and thereby improve its utility and convenience of use.

#### 5 Hydrogen – The fuel of the future

Early in 2006 Indian government unveiled a National Hydrogen Energy Roadmap with the goal of having one million hydrogen fuelled vehicles on road by 2020 and generating 1000 MW from hydrogen through public private initiatives. To achieve this outputs, the national plan includes two major new programs; the green initiative for future transport (GIFT) and the green initiative for power generation (GIP) that will develop and demonstrate a hydrogen power engine and fuel cell based on cars ranging from small cars and taxis to buses and vans.

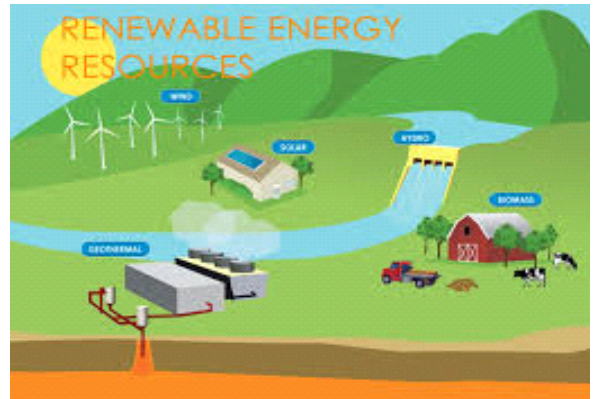
The hydrogen economy promises to eliminate all of the problems that the fossil fuel economy creates. Therefore the advantage of the hydrogen economy include

1. The elimination of pollution caused by fossil fuels: when hydrogen is used in a fuel cell to create power, it is a completely clean technology. The only by product is water, there are also no environment dangers like oil spills to worry about with hydrogen.

2. The elimination of green house gases: if the hydrogen comes from electrolysis of water then hydrogen adds no greenhouse gases to the environment. There is a perfect cycle electrolysis produces hydrogen from water, and the hydrogen recombines with oxygen to create water and power in a fuel cell.

3. The elimination of economic dependence: the elimination of oil means no dependence on the Middle East and its oil reserves

4. Distributed production: hydrogen can be produced anywhere that you have electricity and water. People can even produce it in their homes with relatively simple technology.



#### CONCLUSIONS

By reverting to these renewable resources of energy instead of using the conventional energy sources, we can get energy with minimum possible pollution and it would also be cheap as the energy comes from a renewable source which cannot become scarce.

#### REFERENCE

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