

# Role of Non-Conventional Energy Sources in Make in India - Energy Crisis Problem Solved from Renewable Energy Sources

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## ABSTRACT

In India Every day the population will increase day by day, so demand of electricity is increasing, but from last five years nature has been disturb due to less rainfalls. Most electric power plants are dependent upon the water as the source. To generate electricity through the use of coal power, wind power, water power. so, scarcity of water is also a big problem for developing the production of electricity. so naturally the water source depends upon rainfall, heavy rain has not fallen in Marathwada & Vidarbha also Increase no. of bore every day that most of the water are used Industrial & Agricultural development. so, the review article deals with factor are responsible for energy crisis in our country & from other renewable energy sources we are contribute some energy power to generate electricity, to contribution for make in India. A Renewable energy should be the choice for the solution of energy crisis. We can also fulfill load demand by reducing transmission loss, by use of LED Lamps, Proper load management, by using solar heaters, Solar Lamp by using solar panels. To increase the generation of power we control the misuse & management in power sector. In Incorporating Independent power producers, it's possible to increase the power generation & ensure its proper use in our country. So, initiative should be taken to develop new technology & skilled manpower required for power sector considering renewable energy sources.

**Key words:** Energy crisis; Electric power; Renewable energy; transmission loss; generation power;

## INTRODUCTION

In India Every day the population will increasing day by day & cause of population demand of energy power is increasing which is facing the critical problem of energy crisis [1]. The ultimate source of power for both heating & as well as electricity is fuel [2]. The primary four types of fuel currently used i.e. coal, oil, natural gas, uranium [3]. Thus, the delay of nuclear plants contributes to the power shortage cause of fuel shortage. In power plant center were counting on the increased nuclear capacity & consequently it had done not pay sufficient attention to assure supplies of coal, oil, & gas to the thermal power plants [4]. Total consumption of electricity in India is 697.8 Billion KWh. In march 2013, the per capita total electricity consumption in India counted & that was 917.2KWh & In 2015 it was going above 1000KWh consumption of electricity. Electric energy consumption in agriculture is highest 18% in India so in India 80% villages are covered at least electricity line, just 52.5% of rural households access to electricity. In urban areas the access of electricity is more than 90% & All over India electrification rate is 65% while till the date 35% of the population is rural areas having no electricity provided by Govt. of India. Still in some peoples are lives without access of electricity.

## PRODUCTION OF ELECTRICITY IN INDIA

In India total production of electricity sector is produced the capacity of 255.012GW as end Nov.2014 & generated around 703.1BU for the period April to Nov.2014. so, India becomes third largest producer of electricity with 4.8% global share in electricity generation surpassing Japan & Russia. Renewable power plant constituted 28.43% of total installed capacity & non-Renewable power plant constituted the remaining 7.5%. India generated 967TWh of electricity (including renewable & power plant). The total yearly generation of electricity from all types is 1102.9TWh.[5,6]

A Renewable energy system converts the energy found in sunlight, wind, falling water, sea waves, geothermal heat, Biomass in to arm. We can use such as heat or

electricity. Most of renewable energy comes either from directly & indirectly from sun & wind & it can never be exhausted, therefore it is called as Renewable Energy [7, 8]

However, the most of world energy sources are derived from Conventional Sources, Fossil fuels such as coal, oil & natural gases. These fuels are often termed as non-renewable energy sources. Renewable energy sources are essentially flows of energy. Whereas the fossil & nuclear fuels are in essence, stock of energy.

So, India is one among fastest developing countries which is goes to 21th century finds a huge no. of electric power plants located across country. To generate electricity India has produce technology & expertise by using coal power [9] water power [10], wind power [11] nuclear power [12] Although coal-based plants is main source of fuel per production of electricity in our nation.

## FACTORS OF ENERGY CRISES

### I) Increase of demand

In India population increase since last five decade so India becomes high population country as compare to other country. So surely increase of demand for electricity & provide electricity the demand will high & production will less so scarcity of energy. India being fast developing country the no. of Industries & other sector energy demand is increased. The Companies are multiplying each year & power demand is increased very fast. This is serious issue to provide electricity as per demand & match production of electricity with demand.

### II) Power theft in Rural Areas

In Rural Areas still at the date the peoples are not demanding electricity supply to electricity board & it can directly use single phase line or three phase line by using cable wire. They are used submersible pump for bore as well as motor pump for well to the water supply in farm. So, this has to be stopped today so we can save some energy.

### III) Corruptions in state electricity board

Some Corruption is also a factor of energy crises. In urban area some industry & companies are belongs with political leader, they are also not demand for the electricity supply so scarcity of energy problems are created & they are also managed state electricity board wireman, sub div.Engg.so they can manage with some cost & no one take the action against these peoples. This Corruption has to stop today. So, we can save some energy.

### IV) High transmission loss

In Our country efficiency of electrical equipments used in power station & distribution like transformers & other equipment is very poor as compared to other developed country so there is again chance to some energy by using LED Lamp or Compact fluorescent lamp.

### V) Some delay in commissioning of power project

Sometimes non-availability of funds power project is delayed in India & also by some political problems also faced this delay the project & hence increase the supply verses demand ratio.

### VI) Shortage of Coal

In thermal power plant Coal is very important source as a fuel for production of Electricity. Coal is not available on time & this delay in power generation in thermal power plant.

## HOW TO MINIMIZE ENERGY CRISIS?

### I) by switch off devices

We can use as per our need & we can switch off device carefully when they are not in use. This is our first duty of every Indians. We had present anywhere & seeing those devices when they are switch on & they are not in use we call them electricity wireman or related peoples who had given the charge of electricity that for immediately switch off. So, we can save some energy.

### II) Save Some Energy

We can save our energy by using LED bulbs, that are save power up to 85% & much lighter is provide to us.

Also, in rural areas till at the date some peoples are use simple bulb in home & also in line poles. They may interchange by LED Lamp also.

### III) Use of efficient equipment

Always consider some power saver electric appliances or power saver devices while buying any new electrical equipment.

### IV) We can check power factor

Mostly in Agricultural farm due to motor as well as submersible pump & other similar loads our power factor is not in unity. It increases the current & hence wastage power may be saved by increasing power factor near unit.

## PRODUCTION OF ELECTRICITY BY USING DIFFERENT ENERGY SOURCES

In India has no. of power plants. The production of electricity by different sources is given in below fig. A

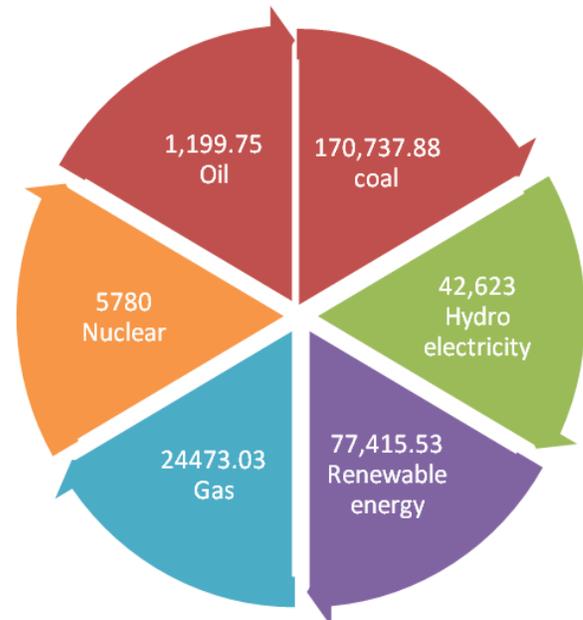


Fig. A-Production of electricity by different sources

These power plants such as Thermal power plant, Nuclear power plant, Hydroelectric power plant & Wind power plants are situated across the country. So whole country is dependent on these power stations. Some important power plants are given below;

### A) Thermal power plants

Thermal power is the largest source of power in India. there are different types of thermal power plants based on fuel used to generate the steam such as coal, gas & diesel. In India 65% of electricity production can be generated by thermal power plant. More than 51% of India's commercial energy demand is met through the country's vast coal reserves. Public sector undertaking national thermal power corporation (NTPC) & several other state level power generating companies are engaged in operating coal based thermal power plants like as Vindhyachal super thermal power NTPC Singrauli Madhya Pradesh, Mundra ultra mega power project Gujarat, Talcher super thermal power station, Odisha, Sipat thermal power station Chhattisgarh, Muthiara thermal power plant Tamilnadu, Hinduja power station Gajuwaka Visakhapatnam etc.

### B) Nuclear Power plants

A nuclear power plant is a thermal power station in which the heat source is a nuclear reactor. As is typical in all conventional thermal power stations heat is used to generate steam which drives a steam turbine connected to an electric generator which produces electricity. India has 4.8GW of installed electricity generation capacity using nuclear fuels. India's nuclear plants generated 32455 million units or 3.75% of total electricity is produced in India including Kaiga Atomic power station, Kakrapur atomic power station, Madras atomic power station & Narora station. Few power stations are under construction Madras, Kakrapur, Rajasthan, Kudankulam.

### C) Hydroelectric Power Plants

India is the seventh largest producer of hydroelectric power. Hydroelectric power potential of 84,000MW at 60% load factor is one of the largest in the world. The present capacity as on 31 March 2016 is 42783MW which is 14.35% of total utility electricity generation capacity of India. These power plants are located at Bhakra dam, Srisaalam, Uri, Madikheda, Bansagar Dam.

### D) Wind Power Plants

India has the fourth largest installed wind power capacity in the world. In 2009-10 India's growth rate was

highest among the other top four countries. As of 31 March 2016 the installed capacity of wind power in India was 26,743MW which is nearly 2.6% of total electricity generation. Most of the electricity can be produced by wind power in Tamilnadu, that wind power capacity is around 35% of India's total. They produced 7455.2MW electricity. Some other wind power stations are Muppandal, Vankusawade, Arasinagundi & Madhyapradesh wind power stations.

## SOLUTION OF ENERGY CRISES BY RENEWABLE ENERGY SOURCES

### Solar Energy

Solar energy is the most important free source of energy since prehistoric times. It is estimated that solar energy equivalent to over 15,000 times the world's annual commercial energy consumption reaches the earth every year. Solar energy can be utilized through two different routes, as solar thermal route & solar electric (solar photovoltaic) route. Solar thermal route uses the sun's heat to produce hot water or air, cook food, drying materials etc. solar photovoltaic uses sun's heat to produce electricity for lighting home & building, running motors, pumps, electric appliances. In solar thermal route, solar energy can be converted into thermal energy with the help of solar collectors & receivers known as solar thermal devices. We can make by using various devices by using solar panels such as solar water heaters, solar cooker, solar water pumps etc.

### Wind energy

The kinetic energy of the wind is converted into electrical energy. Wind energy is basically harnessing of wind power to produce electricity. When the solar radiations enter the earth's atmosphere, different regions of the atmosphere are heated to different degrees because of earth's curvature, this heating is higher at the equator & lower at the poles. So, the air tends to flow from warmer region to cooler, these causes by wind & it is these airflows that are harnessed in windmills & wind turbines to produce power. Now wind power is harnessed to generate electricity in a larger scale with better technology. The basic wind energy conversion

device is the wind turbine. It has two types Vertical axis wind turbine (VAWT) & Horizontal axis wind turbine (HAWT), VAWT in which axis of rotation is vertical with respect to ground & in HAWT in which the axis of rotation is horizontal with respect to ground. From centuries wind power is not a new development as this power, in the form of traditional windmills for grinding corn, pumping water, sailing ships now wind power is harnessed to generate electricity in larger scale with better new technology.

### **Bio Energy**

Bio Energy is also called as Biomass. Biomass is renewable energy resource derived from the carbonaceous waste of various human & natural activities. It is also derived from the numerous sources, including the by product from wood industry, agricultural crops i.e. raw material 7 also from the forest, households waste, industrial waste. Biomass does not add carbon dioxide to the atmospheres it absorbs the same amount of carbon in growing as it releases when consumed as a fuel. Biomass an important source of energy after shortage of coal, oil, natural gases. Bio energy in the form of biogas, which is derived from biomass, is expected to become one key energy resources for global sustainable development. Bio energy is used for cooking, mechanical application, pumping, power generation & some other devices are bio gas plant, Gasifier, Gasifier engine pump set, sterling engine pump set, producer gas etc. Another important is resource is Biofuels.i.e. Biomass can be converted directly in to liquid fuels for our transportation needs.

Ethanol is an alcohol, similar to that used in Beer & Wine. It is made by fermenting any biomass high in carbohydrates (starches, sugars, or celluloses) through a process similar brewing beer. Ethanol is mostly used as a fuel additive to cut down a vehicle's carbon monoxide & other smog causing emissions.

Biodiesel produced by plants such rapeseed (canola), sunflowers & soybeans, can be extracted & refined in to fuel, refined in to fuel, which can be burned in diesel engines & buses. Biodiesel can also make by combining

alcohol with vegetable oil, or recycled cooking greases. It can be used as an additive to reduce vehicle emission (20%) or in its pure form as a renewable alternative fuel for diesel engines. So, Bioenergy is the main important renewable energy source for energy crises.

### **Tidal Energy**

Tidal energy is also called as lunar energy or ocean energy Tidal electricity with the help of turbine generation involves the construction of a barrage across an estuary to block the incoming & outgoing tide. The head of water is then used to drive turbines to generate electricity from the elevated water in the basin as in hydroelectric dams. Some barrages can be designed to generate electricity on the ebb side, or flood side, or both. Tidal range may vary over a range (4.8 to 12.4m) from site to site. A tidal range of at least 7 m required for economical operation & for sufficient head of water for the turbines. Ocean is cover more than 70% of earth's surface making them the world's largest solar collectors. Ocean energy draws energy of ocean wave, tides or the thermal energy stored in the ocean. The sun warms the surface water a lot than the deep ocean water, & these temp differences stores thermal energy. Ocean thermal energy is used for many applications, including electricity generation. There are three types of electricity conversion systems, closed cycle, open cycle & hybrid. Closed cycle systems use the ocean's warm surface water to vaporize a working fluid, which has low boiling point, such as ammonia. The Vapour expands & turns a turbine. The turbine then active as a generator to produce electricity. Open cycle systems act as boil the sea water by operating at low pressures; this produces steam that passes through a turbine. The Hybrid systems act as both open & closed cycle systems.

## **CONCLUSION**

Day by day Population is increased the energy Demand is increased so we move towards renewable resources, the best possible solutions is to reduce the worlds dependence on non-renewable resources & to improve overall conservation efforts. Most of the industrial age was created using fossil fuels, but there is also

technology that uses other types of renewable energies such as solar energy, wind energy, steam or thermal energy. The major concern is not so much that we will run out of gas or oil, but that the use of coal is going to continue to pollute the atmosphere & destroy other natural resources in the process of mining the coal that it has to be as an energy source. In present day in Raipur & Bilaspur District (C.G.) the most of the power industries are Manufactured power itself by coal but they got license of power production from coal & rice husk but not actually there, therefore Environment of Chhattisgarh is fully destroyed temperature is increases. so, we need Environmental atmosphere be safety & also our demand of electricity is fulfilling so all the responsible factors of energy crises are discussed in the paper & we are going to next future with the use of maximum renewable sources of energy.

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