

Role Of Renewable Energy Development In Economic Growth: Indian Perspective

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ABSTRACT

With the rising concern towards climate change, developing countries are moving towards Renewable Energy sources. By promoting the use of renewable energy, we can enhance the sustainable environment for livelihood and assist in economic growth. This paper focuses on the role of renewable energy in the economic growth of India. It focuses on the government policy framework for renewable energy development and its reflections on the increase in the economic growth of the country.

Keywords: Renewable Energy; Economic Growth; Wind Energy; Solar Energy.

1. INTRODUCTION

India is one of the fastest-growing economies in the world. It follows the institutional framework for fulfilling the needs of energy by which it entices new investment in the energy sector. Fig. 1 illustrates the total energy supply in versus years for different sources like Coal, Natural Gas, Biofuels, etc. The government of India targets to have 175 GW of installed capacity by 2022. During the UN's Climate Summit, PM Narendra Modi Ji declared a neoteric aim of RE (Renewable Energy) capacity 450 GW. For consistent success in the development of RE's, it is required that the following activities like a connection of grid, auction procedures, grid interconnection, and operation of DISCOMs should be executed properly. [1]

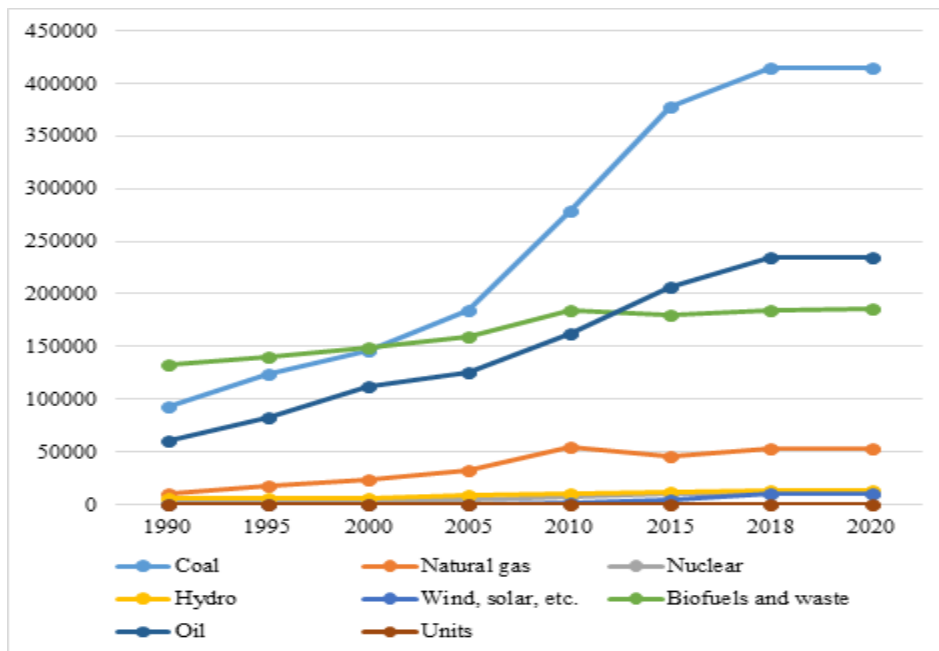


Fig. 1 Total Energy Supply by Source in India [Source: IEA]

2. RENEWABLE ENERGY

Renewable Energy [2] is obtained from natural sources. They can renew again and again. These types of sources are having no time limit. These sources are refilling rapidly as compared to the rate of usage. The classification of Renewable Energy Sources is illustrated in fig.2. [3]

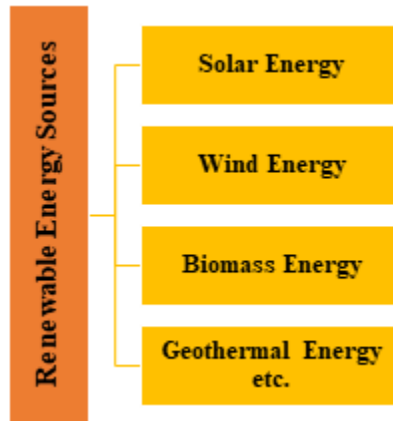


Fig. 2 Classification of Renewable Energy Sources

A. Solar Energy

A kind of energy that we directly seize from the sun or the energy received from the sun in the form of electromagnetic radiation is called Solar Energy.[4] It can be further converting into thermal energy or electric energy. Solar Energy System is shown in Fig.3.The types of solar energy are as follows:

- Active Solar Energy
- Passive Solar Energy
- Photovoltaic Solar Power
- Solar Thermal Energy
- Concentrated Solar Power

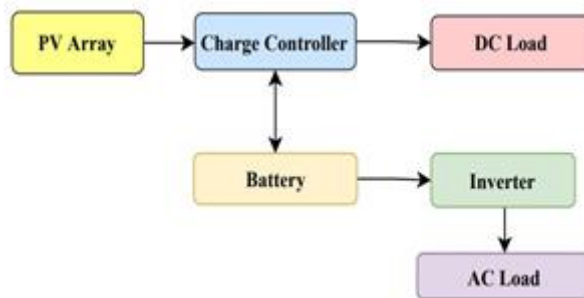


Fig. 3 Solar Energy System [5]

B. Wind Energy

Wind Energy[6] is a renewable energy source. India ranked at 4th position in terms of installed capacity of wind power. In the case of wind power, the wind strikes the turbine blades and the turbine starts rotating which in turn rotates the generator shaft which is coupled with the turbine, and wind energy is converted into electrical energy. Several control circuits are used at the output end to step up the voltage. Fig. 4 illustrates the wind energy system. [7]

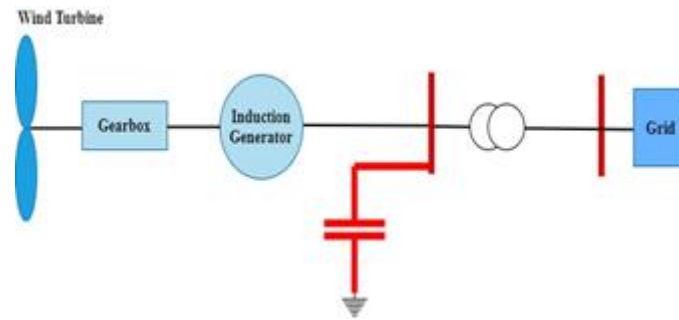


Fig. 4 Wind Energy System

C. Biomass Energy

The energy obtained from renewable organic materials is called Biomass Energy. These organic materials are obtained from plants & animals. The following types of biomass are illustrated in fig.5. As stated by Power Ministry, India is having the potential to generate 18000 MW of energy from biomass. [8]

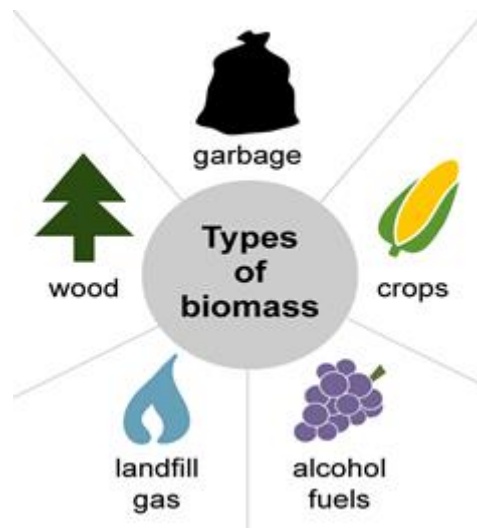


Fig. 5 Types of Biomass

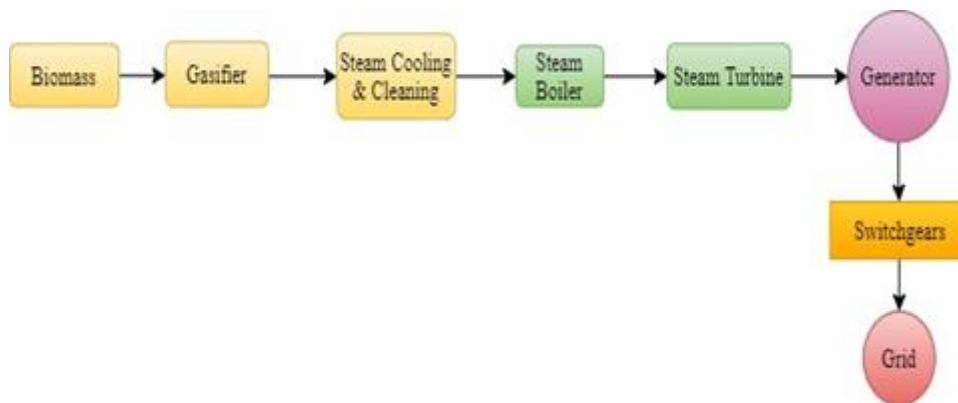


Fig. 6 Block Diagram of Biogas Power Plant

D. Geothermal Energy

In Geothermal Power Plant, the Heat energy available inside the earth's surface is used to produce electrical power. This type of well is dug at the selected area where a hot spring is available. One is Projection Well through which steam is allowed to come above the earth's surface whereas through injection well steam is given back to the earth's surface in form of water through the cooling tower. The basic diagram of the geothermal power plant is shown in fig.7. [9]

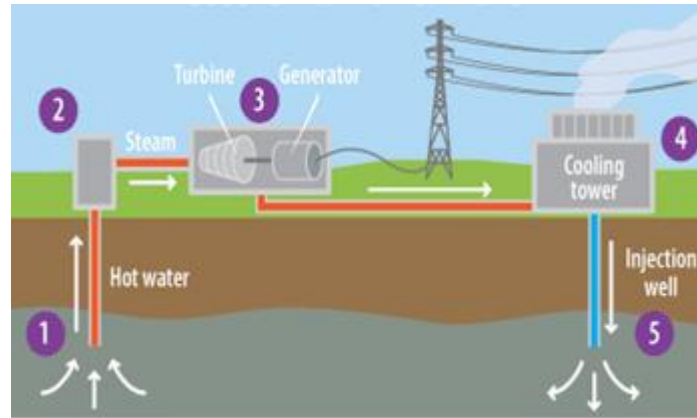


Fig. 7 Block Diagram of Geothermal Power Plant

3. ROLE OF RENEWABLE ENERGY DEVELOPMENT IN ECONOMIC GROWTH

Energy plays a crucial role in the economic enrichment of any country. The government of India has taken several key initiatives to fulfill the energy needs of the country and has a special ministry for Renewable Energy Development called MNRE.[10] Recently the Draft Electricity Bills 2020 have also given new heights in the same sector. Organizations like SECI are working towards solar energy development in the country with very effective schemes like Uday Scheme, JNSM, etc. The government also promotes the use of Electric Vehicles to reduce emissions and protect the environment. Ultimately the objective is set to reduce the dependency on Coal Based Power Station. Also to reduce government expenses on the purchase of coal for power generation. The Ministry of Renewable Energy is committed to having a 175 GW renewable capacity by the year 2022. Government of India targets by 2022:[11]

- Solar Energy with a capacity of 100 GW.
- Wind Energy with a capacity of 60 GW.
- In 20 States 33 Solar Parks are proposed.[12] Several Advantages of Renewable Energy Development in raising Economic Growth of India are as follows:
- Due to the adaptation of Renewable Energy, the expenses on the purchase of coal for the generation of power will drastically reduce, Hence Government Funds can be saved.
- So many opportunities are generated for Engineers, Technicians, and office staff members in the area where the RE plant is going to be established.[14]
- Local Employment Facility will facilitate laborers not to migrate.
- Good Business opportunity for Transporters, Material Suppliers and Ancillary Unit located in the vicinity.
- It increases the investment from foreign countries.[13]

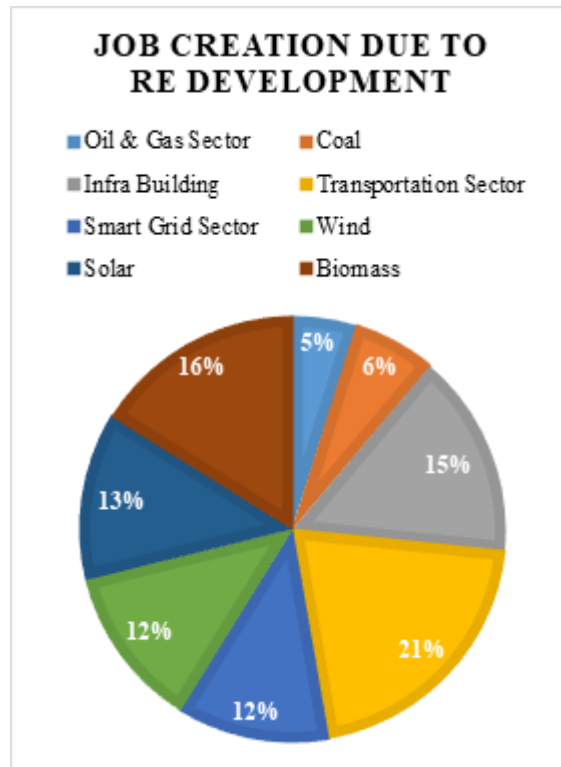


Fig. 8 Job Creation due to RE Development

With the development of renewable energy projects job opportunities in several sectors will open like Coal Sector, Infra Sector, Smart Grid Sector, Wind Sector, Biomass Sector, Transportation Sector, Solar Sector, etc.as illustrated in fig. 8. Literature study shows that for Renewable Energy [RE] there is good societal support. This can categorize into three categories as illustrated in fig.9:

- **Socio-Political Acceptance:** Acceptance of renewable energy as a viable energy source and supported in government policy and by the common public.
- **Community Acceptance:** Acceptance of specific renewable energy project development by countries.
- **Market Acceptance:** Acceptance of renewable energy technology by investors, financial institutions, and consumers of energy.



Fig. 9 Public Support on RE Projects

4. CONCLUSION

For the last few years, energy plays a crucial role in the development of the country. Particularly considering the Indian scenario the energy demand is increasing drastically. India is having a very nice potential for renewable energy. With the rise in RE-based projects, the economy of the country is also boosting. Due to RE projects foreign investments are increased and employment opportunities for persons residing in vicinity

areas. We can conclude that renewable energy projects play a very important role in the economic development of India.

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