



# RENEWABLE ENERGY USAGE AND SUSTAINABLE GROWTH AN INDIAN PERSPECTIVE

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## Abstract

The usage of energy resources per person actually a significant factor to determine the quality of human life(HDI) as per the latest report of UNDP. As per the global estimate, the per capita energy consumption by an average American in a single day is equivalent to that of a person from Burkina Faso in a year. This contrast can also be attributed to usage of large percentage of conventional fuels in underdeveloped countries to the maximum usage of commercial fuels in developed countries. That is why the consumption of energy in underdeveloped and developing countries in near future will be ever increasing as all those nations will naturally have the aspiration towards growth and most modern lifestyle. More energy requirement means the more carbon foot prints because of excessive rate of use of non-renewable energy resources. The impact of excessive carbon emission to the nature has already started showing some of the adverse effects like, global warming, the rapid melting of ice in Arctic regions, resulting in sea water level rising and many more. Hence the alternate is to go for renewable energy resources, which can actually check the excessive carbon usage. India with more than 1.40 billion people has to act very quickly and smartly to minimise the damage to the environment without compromising her growth story. To make a sustainable development model, the thrust should be put on renewable and new energy resources, minimising the heavy dependence on fossil fuels for her sustainable growth. In my paper, I shall try to highlight India's achievement in renewable energy and her capacity building measures, new innovations to sustain and achieve a growth up to 500GW of renewable energy producer by the year 2030.

Key Words: HDI, renewable energy, sustainability, carbon foot print, new innovation, etc.

## Introduction:

The human development index (HDI) depends on many factors like education, health care, communication, birth rate, life expectancy, etc. Having said so one of the most vital point is usage of per capita energy. There is a correlation with gross domestic product and energy consumption. In recent study it has been found that there is a strong relationship with not only energy usage but with the optimum use of commercial energy as compared to conventional fuels result in a higher HDI values. The top most ten nations having highest HDI values use almost 80 to 90% of commercial energies while the bottom most 10 HDI countries use more than 90% of conventional fuels. The greater usage of conventional fuels are generally non-renewable energy sources,

mainly termed as fossil fuels. These are carbon rich fuels, excessive burning of these fuels in air produces more and more carbon, those in turn becomes environment hazards and create many types of pollution. The question thus arises how by a policy the developed nations will put an obstacle for the energy consumption of such underdeveloped and developing countries?. Is there any amicable solution to this situation? There is no denying the fact that it is almost certain that the excessive use of fossil fuel has already had an adverse effect to the environment. The result of which can be felt from the phenomenon of global warming, the increased rate of melting of glaciers and subsequent water level rise in sea, are the present scenario, which is not an imaginary thing but hard ground reality. The environmentalists are busy in finding out the solution of these global problems. There is another point of view which is also pertinent that to overcome from the poverty and to lead a quality life by an individual human being is quite but natural irrespective of his caste, creed, religion, skin, geographical location. Therefore, as human race is progressing they require more energies for sustainable growth. One of the key indicator of pollution is excessive carbon emission to the environment, the reduction of carbon can be achieved by less use of fossil fuels which actually are in the class of non-renewable energies. The renewable energies which are also coined as alternate sources of energy can minimise the use of conventional fuels. Though the environmental impact is less in usage of renewable energy resources but sometimes those are not preferred because of their less calorific values and cost. But, any growth without the sustainable approach is contrary to the development for long time, hence it is quite obvious the future of human energy consumption will bend towards new and renewable, clean less environmental hazardous energy resources. Our country has realised this sustainable goal and giving more emphasis in recent years to increase her capacity in renewable energy resources by incentivising this new and emerging sector in central, state and private partnership levels. India is currently worlds 5<sup>th</sup> highest solar power harnessing country where as its wind power is in number 4 position globally as per (IRENA). India has cumulative installed capacity of 45% energy from non-fossil fuel sources. (MNRE Data, 2024).

### **Major renewable energy sources in India:**

The major components which contribute in India's renewable energy resources, consists of a) solar power, b) wind power, c) biomass, d) hydroelectric power, e) waste to power. Besides these new source of renewable energy is hydrogen, this is one of the most clean form of energy as its production emits zero carbon emission to the atmosphere. The future is very bright because of National green hydrogen mission, hydrogen and ammonia production as fuel and replacing the tremendous amount of dependence on fossil fuel will be a real game changer not only in reduction of further environment degradation but also for sustainable development as India can export these production technologies to earn foreign investment.

In this section I shall present the current scenario, sector wise which in production stage in our country as per the data available in Ministry of new and renewable energy (MNRE,2024), Government of India official website.

**a) Solar Power:** In solar power sector there are further division as per usage, namely, installed solar PV panels at the ground level, grid connected solar rooftop, hybrid projects, off grid solar. The cumulative production of solar power as per the last data available is 85.47 GW. In this sector there are three major players central government, state government and private partners. The one of the major obstacle in using solar energy in door to door use is its initial installation cost. The other one is sometimes the efficiency of solar cell is little bit less as compared to other sources. The first obstacle has been removed by PM KUSUM scheme, the three components of the scheme are, component i; installation of 10,000MW of solar capacity through small solar power plant of 2MW each. Component ii, to install 20 lakh standalone solar powered agriculture pumps. Component iii, solarisation of 15 lakh grid connected agriculture pumps. The above mentioned schemes are all

subsidised at different levels in different parts of India. Another programme to attain the goal of sustainable energy is PM Surya Ghar Muft Bijli Yojana, under this scheme bank offers subsidised loan to customer for a period of 10 years depending on the requirement of individual customer. For instance up to 2KW solar panel installation a loan up to 2lakh will be sanctioned with a marginal rate of interest from the bank to the customer and so on. This ensures reduction of electricity bills on the customer part and also lessen the carbon foot print to the environment because of use of fossil fuels. The government also offers subsidies under this scheme by considering the financial status of the individual for installation of rooftop solar panels. National Institute of Solar Energy is the apex institute under MNRE, for research and development in the field of solar energy. The projects which are being developed by NISE and other renewable energy projects such as wind power, hybrid, round the clock renewable energy, hydrogen etc., are being implemented by another agency named as Solar energy Corporation of India both India and abroad.

**b) Wind power:** India has shown remarkable progress in the wind power generation sector as it can be easily realised that capacity of production increased rapidly 2.18 times from 21GW to 45.88 GW in the last decade. This is also one of the cleanest form of energy. The windmills are set up in western coast and eastern coast lines offshore and onshore to harness the abundance of wind blowing available along the coast lines in India. This energy also significantly reduces carbon foot prints in air.

**c) Biomass:** The biomass production as also significantly increases in last five years. The data available till June, 2024 shows 9433.56 MW biomass (bagasee) and 921.79 MW in biomass (non bagasee) were recorded.

**d) Small hydropower:** The cumulative production till the data available is 5000.25 MW. It is a game changer in hilly as well as plane areas with 2 MW installation capacity, the clean energy can be transmitted with ease. It also reduce the human suffering related to displacement in big dam hydel projects. The big dam not only has a potential of threat to the people staying in the low level areas during excessive floods as well as it also effects the bio diversity of flowing river. Therefore small hydel project can reduce the burden of environment as compared to big or macro hydel projects.

**e) Waste to power :**The off-grid production data shows 343.62 MW till the latest data available where as the on grid data shows the production of 249.74 MW of renewable energy.

The overall renewable energy production in India up to, June 2024 is 148084.64 MW cumulatively out of which India has augmented by 4440.13 MW of renewable energy in the first quarter of the financial year 2024-2025.

**Result and data analysis:** The above data representation has been shown with a line diagram where it clearly shows the percentage of different renewable energies contribution towards the total renewable energy production in a fare manner. As we also know that there is a little contribution of geothermal energy, tidal energy are also there in renewable energy class. Those data are not available for the present study.

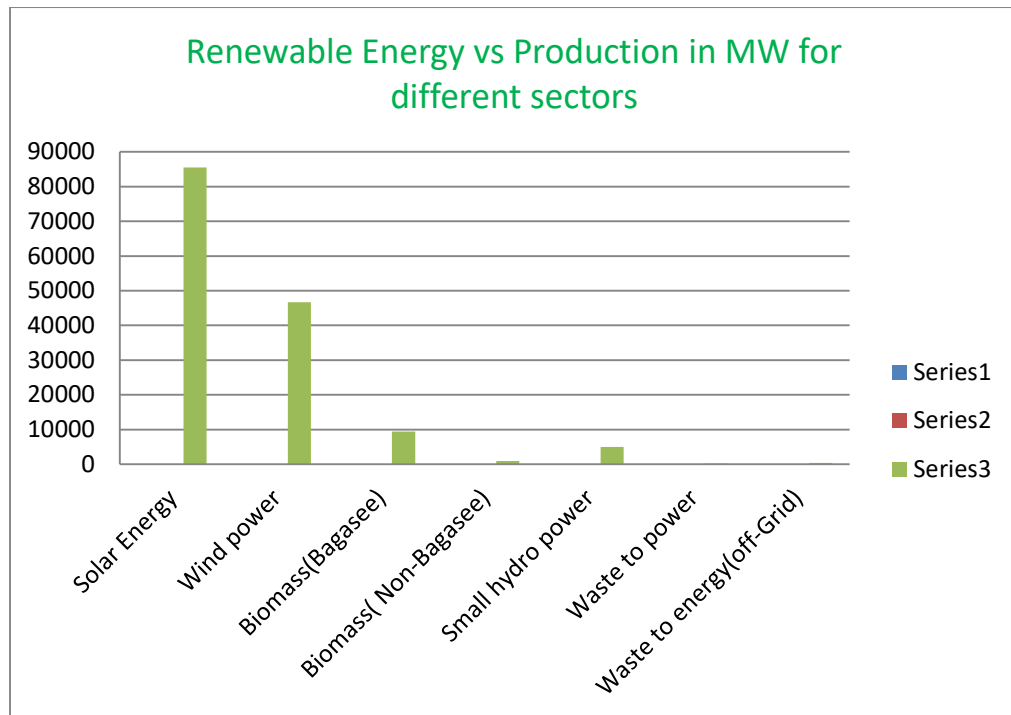


Figure:1 The latest data of Renewable energy production in India, its share in different sectors.

India's total power installed capacity as per data available is 446000.20 MW out of which 14840.64 MW is from renewable energy production sectors. It is almost 30%. But to reduce the carbon foot prints it is highly essential that India should use less thermal projects which essentially means more burning of coals and production of more carbonaceous elements for the environment. This fact can be understood easily as coal accounts for 48.77% of total energy production where as the most abundant of renewable energy solar energy accounts for only 19.16% of total energy. If we compare the data from countries like China as per 2021 report 31% of global renewable electricity were produced by her. Germany uses 52.3% of its total energy in the form of renewable energy. India is way behind in that regard we produced 3.1% of global renewable electricity. As our energy policy vision document thrives for clean, affordable, energy security, energy availability energy efficiency, energy equity for all. It is high time that there must be acceleration in renewable energy production. It has many benefits such as to overcome the phenomenon of global warming it means if the reversal of it can be achieved by the consorted efforts by all stake holders will have a lasting impact on carbon foot prints. India has ambition of achieving 500GW of renewable energy production by the year ending 2030. In my opinion it is quite achievable target if all government agencies both in centre and state levels in partnership with industries and individuals will definitely achieve those. India has also a zero emission policy by the year ending 2070. To achieve it new renewable energy that is clean hydrogen fuel will be a key. The production of clean hydrogen energy and ammonia will reduce the carbon emission to bare minimum as in their production chances of carbon emission is very little.

**Conclusion:** This is the right time when every citizen of the country should be aware of the bad effects of excessive use of fossil fuels. In a 1.4 billion people nation the need for more and more amount of energy is quite but natural. Having said so, it is also imperative that Indian government has to follow Paris protocol which says reduction of carbon usage, which is also essential to further damage our environment. The people are now aware of the terms like depletion of ozone layers by the excessive use of CFC gases in AC's and refrigerators and also global warming, glacier melting rates become faster causing sea water level to rise. Eventually inundating many port cities of the world. Kolkata and Mumbai are vulnerable cities to list a few in our own country. So is there

any alternative? Yes we have by choice or compulsion we have to lessen our energy dependence on fossil fuel and steadily with faster rate move towards renewable energies to fulfil our energy needs. The rate of decrease of fossil fuel also proportionally improves the quality of air we shall breathe and water contamination to a large extent.

### References:

- [1]. <https://mnre.gov.in> Ministry of New and Renewable Energy, Govt. of India data ( 2024)
- [2]. <https://iced.niti.gov.in>
- [3]. www. wikipedia.org
- [4]. IRNEASTAT Online Data Query Tool, (2023)

