

Role of Renewable Energy in Indian Economy

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Abstract. Renewable energy sources are non-conventional energy sources which are the need of the hour. Renewable energy sources contribute a lot in the reduction of green house gases emission along with having several socio-economic advantages when compared to carbon-based fossil fuels. Renewable energy sources are the answer to India's energy demands which are growing and are expected to grow exponentially in the future. Through the "Make in India" initiative of the Indian Government, Renewable Energy will account for significant job creation in urban areas as well as rural areas along with several other renewable energy policies which cover Solar Energy, Wind Energy among other renewable energy sources. Renewable energy is responsible for sustainable jobs resulting in a boon for the youth of India. This paper highlights the significance of renewable energy, impact of renewable energy on the social and economic landscape of India and the government initiatives for the promotion and expansion of renewable energy sources in the country.

Keywords: renewable energy, fossil fuels, Indian economy, Government effort.

1. INTRODUCTION:

Energy is the basic exigency in any work field. Energy is preponderating of two types that is: Renewable and Non-Renewable Energy. Our main focus and pursuit is on Renewable Energy. Renewable Energy has its rootlet in nature and it can be replenished time to time. Renewable can be used in any field, like power generation, transportation, etc. In today's epoch there are several technologies developed just like Solar panel, Wind Mill, Wind Turbine etc. for generation of renewable energy. Renewable Energy can be proliferating from sunlight, wind, tidal, waves, biomass etc. Today the world is moving towards the renewable energy due to its easy and infinitely presence in nature.



In 19th century, coal was used as an energy evacuation but in last few years renewable energy is superseding the coal, petroleum as well as fossil fuel energy. As this field is accenting diurnally the jobs are also skyrocketing [1].

2. ENERGY DEMAND OF INDIA DUE TO POPULATION:

It is a well-known fact that India has the second largest population in the world and is also the fastest growing population in the world. It is estimated that India's population will overtake China's by the year 2025. India has done well to provide adequate energy for its growing population being the third biggest electricity consumer in the world, however India has the lowest per capita electricity consumption (Unit) among the developed and developing countries in the world. India's median age is 27 years, having a considerable amount of youth population it will need to satisfy their growing energy needs. One must also remember that India is an active participant of the Paris Climate Agreement hence through renewable energy India is looking forward to bringing down its greenhouse gasses emissions ushering socio-economic change.

Thermal energy provides for 61% of total installed capacity, considering the Indian Government's commitment to renewable energy policies such as Jawaharlal Nehru National Solar Mission and Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME), the involvement of Thermal Energy is set to decrease.

Not only will the investment in renewable energy pay off it will also decrease the burden on India's foreign reserves most of which are spent on purchasing fossil fuels, in addition to creating a massive amount of sustainable jobs for the exponentially growing youth population of India.

India's geographical position is a blessing for the utilization of renewable energy as it has almost 300 sunny days which are a boon for the solar energy industry in India and a coastline of 7500KM for the installation of wind energy farms. India's gargantuan rural population will also contribute to its energy needs through Bio-Gas plants. With the even distribution of production of energy in India which has been made possible through renewable energy, India's per capita electricity consumption (Unit) will also increase signalling a positive socio-economic trend.

3. RENEWABLE ENERGY IN INDIA:

Taking lessons from the 1979 energy crisis, several countries began exploring the possibilities of Renewable Energy with an increased zeal. India formally began its journey into the world of Renewable Energy in 1981 when The Commission on Additional Sources of Energy (CASE) was established additionally the Department of Non-conventional Energy Sources (DNES) set up in 1982. Financial aspects of the Indian renewable energy sector were to be the responsibility of IREDA

(Indian Renewable Energy Development Agency) which was founded 1987. The Ministry of Non Conventional Energy Sources (MNES) which later became the Ministry of Non-Conventional Energy Sources were initiated in 1992 as a separate ministry with a Minister of State in charge.

India stands 3rd in the list of countries that produce the most electricity as of 2016; it's the 5th largest wind energy producer having wind energy potential of 102.8 GW. It has Hydro energy potential of 19.7 GW, Bio power potential of 22.5 GW, Solar power potential of 6 GW and it is expected that 22,000 MW of solar power would be generated by 2022 [3]

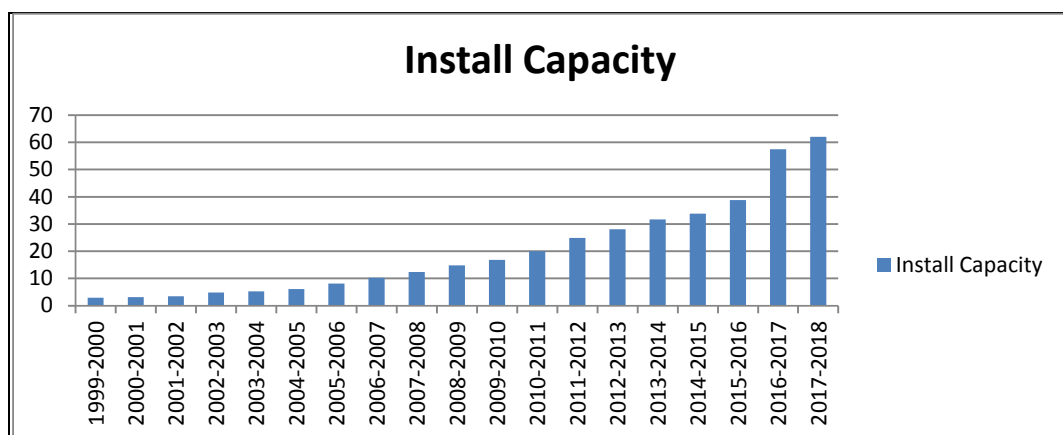


Fig 1: Renewable Energy Installed Capacity Growth for 18 Year to Year (in GW) [4]

4. GOVERNMENT EFFORTS TO REDUCE POLLUTION AND TO PROMOTE THE CONCEPT OF RENEWABLE ENERGY:

In last few years, India is working on making environment pollution free through use of renewable energy. Government of India has taken umpteen steps towards it; they have started with automobile sector which is a major part responsible for pollution. Battery Operated Vehicle is one of the government initiatives to slacken the defile environment.

Jawaharlal Nehru Solar Mission [5], Faster Adoption and Manufacturing of Electric Vehicles (FAME) etc. are the epochal prelude in renewable energy field. Whereof increasing focus on renewable resources in order to reduce reliance on conventional fuels, coal in particular, for the long-term [6].

Presently, there are huge investments opportunities in the Indian RE sector. Infrastructure growth has been made a national priority by our new Union Government, which is led by Prime Minister Narendra Modi. This sector is expected, including the manufacturing, to drive the economy in the next five years. Keeping up with this vision, MNRE has scaled up renewable targets manifold to about 175 GW by 2022 which accounts to 90 per cent of this volume dedicated to solar and wind-based power.

5. JOB CREATION:

Due to the neoteric underlay of Renewable energy field, there are agglomeration jobs in this sector which not only lead to power evulsions but also a good realm for deputation of Indian youth in energy sector. Energy is the initial thing which all industries requires, no any machine or doohickey can run without energy (except manual machines). So, for the generation of energy companies and government have to employ the roustabout. Government has taken umpteen initiatives for development of renewable energy in India through “MAKE IN INDIA” project. Tata Power Solar Systems, Waaree Solar etc. are the major companies who are outbidding the solar energy sector in India. Vestas India, Inox Wind etc. are the major companies who are superinducing the wind energy sector in India. Institutional & Domestic Biogas Plant, FRD Biotech etc. are the major companies who are developing the biogas energy sector in India.

6. CONCLUSION:

Indian government is interested to generate the employment in the power sector which is unstrapped till now. Still India depends upon foreign oil export to run automobiles and industries, which ate a large portion of foreign currency earn by the India through exports. Since sun is shining all 12 months in major portion of India, Solar energy is a good alternative of generation of energy. India has a coast line of 7500 KM, which is a good place to generate the wind energy. According to census 2011 around 69% of Indian citizens lives in rural area and involved in husbandry and agriculture.

Above three renewable energies are new to Indian market and can generate a lot of employment in manufacturing, installation and maintenance of renewable products at the dedicated site. Indian Government is pushing this sector because energy generation through this does not create green house gases, creates clean environment and are infinitely available.

References

- [1] Narula, K., Reddy, B. S., Pachauri, S., & Dev, S. M. (2017). Sustainable energy security for India: An assessment of the energy supply sub-system. *Energy Policy*, 103, 127-144.
- [2] PLANNING COMMISSION of India, 2002, Indian Government Report.
- [3] Ramachandra, T. V., Jain, R., & Krishnadas, G. (2011). Hotspots of solar potential in India. *Renewable and Sustainable Energy Reviews*, 15(6), 3178-3186.
- [4] Ministry of New and Renewable Energy Report on Renewable Energy Installed Capacity Growth (2015), http://mnre.gov.in/file-manager/annual-report/2014-2015/EN/Chapter%201/chapter_1.htm.
- [5] Tripathi, L., Mishra, A. K., Dubey, A. K., Tripathi, C. B., & Baredar, P. (2016). Renewable energy: an overview on its contribution in current energy scenario of India. *Renewable and Sustainable Energy Reviews*, 60, 226-233.
- [6] Bajpai, S., & Kidwai, N. R. (2017). Renewable Energy Education in India. *Comparative Professional Pedagogy*, 7(4), 103-113.
- [7] Krishnamurthy, S., Joseph, S., Pradhan, V., & Rao, P. (2017). Empowering Women of Rural India for Renewable Energy Adoption—An Exploratory Factor Analysis. *Indian Journal of Science and Technology*, 10(37).
- [8] Rehman, S., & Hussain, Z. (2017). Renewable energy governance in India: challenges and prospects for achieving the 2022 energy goals.
- [9] Sindhu, S., Nehra, V., & Luthra, S. (2017). Solar energy deployment for sustainable future of India: Hybrid SWOC-AHP analysis. *Renewable and Sustainable Energy Reviews*, 72, 1138-1151.
- [10] Sawle, Y., Gupta, S. C., & Bohre, A. K. (2018). Socio-techno-economic design of hybrid

renewable energy system using optimization techniques. Renewable Energy, 119, 459-472.