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(१९६० ते २०२०)”

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SOLAR TECHNOLOGY: AN ALTERNATIVE SOURCE OF ENERGY FOR NATIONAL DEVELOPMENT

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ABSTRACT

This paper presents a diagnostic review on the penetration of the solar energy technology in India. It also includes a survey of the latest government policies and incentives for renewable energies deployment by entrepreneurs, industry and commercial and residential consumers. In addition, the paper analyses how to best meet the requirements for policy support and information technology to boost the deployment of solar technology in India. This study was mostly based on results of a widely distributed survey covering key issues and also environmental benefit of solar energy in India.. The study pointed out some of the main obstacles to effectively promote and improve government policies and actions for investment in solar technology market in India.

HIGHLIGHTS:

- Current status on the solar energy deployment in India .
- Government target for achieving the solar power in India by 2022
- Policy framework required to support solar energy
- Environmental benefit of solar energy.

METHODOLOGY:

The study is based on secondary sources of data. Different books, and relevant website have been consulted in order to make the study an effective one.

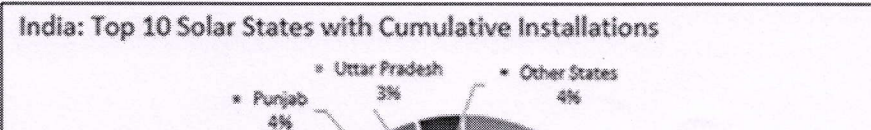
INTRODUCTION:

Being among the most populated country with one of the fastest growing economies in the world, the country is met with ever-increasing fossil fuel consumption. The use of fossil fuels for energy is threatening India with emission pollutants, the import burden of crude oil and natural gas, and coal resource extinction. Clean energies have long been thought to reduce or eliminate a country's dependence on fossil fuels for electricity generation. In the past decade, India has made major additions to its renewable & alternative energy capacity, especially with

Off-grid decentralized and low-temperature applications will be advantageous from a rural electrification perspective and meeting other energy needs for power and heating and cooling in both rural and urban areas. From an energy security perspective, solar is the most secure of all sources, since it is abundantly available. Theoretically, a small fraction of the total incident solar energy (if captured effectively) can meet the entire country's power requirements.

There has been a visible impact of solar energy in the Indian energy scenario during the last few years. Solar energy based decentralized and distributed applications have benefited millions of people in Indian villages by meeting their cooking, lighting and other energy needs in an environment friendly manner. The social and economic benefits include reduction in drudgery among rural women and girls engaged in the collection of fuel wood from long distances and cooking in smoky kitchens, minimization of the risks of contracting lung and eye ailments, employment generation at village level, and ultimately, the improvement in the standard of living and creation of opportunity for economic activities at village level. Further, solar energy sector in India has emerged as a significant player in the grid connected power generation capacity over the years. It supports the government agenda of sustainable growth, while, emerging as an integral part of the solution to meet the nation's energy needs and an essential player for energy security.

National Institute of Solar Energy has assessed the Country's solar potential of about 748 GW assuming 3% of the waste land area to be covered by Solar PV modules. Solar energy has taken a central place in India's National Action Plan on Climate Change with National Solar Mission as one of the key Missions. National Solar Mission (NSM) was launched on 11th January, 2010. NSM is a major initiative of the Government of India with active participation from States to promote ecological sustainable growth while addressing India's energy security challenges. It will also constitute a major contribution by India to the global effort to meet the challenges of climate change. The Mission's objective is to establish India as a global leader in solar energy by creating the policy conditions for solar technology diffusion across the country as quickly as possible. The Mission targets installing 100 GW grid-connected solar power plants by the year 2022. This is line with India's Intended Nationally Determined Contributions (INDCs) target to achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources and to reduce the emission intensity of its GDP by 33 to 35 percent from 2005 level by 2030.



Recently, India achieved 5th global position in solar power deployment by surpassing Italy. Solar power capacity has increased by more than 11 times in the last five years from 2.6 GW in March, 2014 to 30 GW in July, 2019. Presently, solar tariff in India is very competitive and has achieved grid parity.

➤ **GOVERNMENT TARGET FOR ACHIEVING THE SOLAR POWER IN INDIA BY 2022 :**

According to the Ministry of Power, 581,397 numbers of villages are electrified, out of 597,464 numbers of villages in India at the end of October 2015. Government of India set a target for electrification in all villages within the year 2022. Due to the limitation in power generation from conventional sources, government has moved towards renewable energy sources for full-filling the demand of consumers. In recent times, uses of solar energy resources have increased significantly in all over India. Government of India has set a target to achieve total electric power of 175,000 MW from renewable energy by the year 2022, out of which around 100,000 MW of electricity will be produced from solar energy. Uttar Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu and Gujarat will be the major producer of alternative source solar energy by the year 2022 due to the high solar potential, irradiation etc. Available in these states. The highest amount of solar power will produce by Maharashtra with 11,926 MW capacity. The total solar power produced by the year 2022 will be around 23 times of present scenario. The geographic distribution of state-wise break-up of renewable power target, which has to be achieved by the year 2022. The target for the installation of solar power in India throughout all regions is very high as compared to other renewable sources. An overall target for solar power installation is about 57-58% of total renewable power by the year 2022.

➤ **POLICY FRAMEWORK REQUIRED TO SUPPORT SOLAR ENERGY :**

In order to achieve the above target, Government of India have launched various schemes to encourage generation of solar power in the country like Solar Park Scheme, VGF Schemes, CPSU Scheme, Defense Scheme, Canal bank & Canal top Scheme, Bundling Scheme, Grid Connected Solar Rooftop Scheme etc.

Various policy measures undertaken included declaration of trajectory for Renewable Purchase Obligation (RPO) including Solar, Waiver of Inter State Transmission System (ISTS) charges and losses for inter-state sale of solar and wind power for projects to be commissioned up to March 2022, Must run status, Guidelines for procurement of solar power through tariff based competitive bidding process, Standards for deployment of Solar Photovoltaic systems and devices, Provision of roof top solar and Guidelines for development of smart cities, Amendments in building bye-laws for mandatory provision of roof top solar for new construction or higher Floor Area Ratio, Infrastructure status for solar projects, Raising tax free solar bonds, Providing long term loans from multi-lateral agencies, etc.

energy needs. Solar products have increasingly helped to meet rural needs; by the end of 2015 just under one million solar lanterns were sold in the country, reducing the need for kerosene. That year, 118,700 solar home lighting systems were installed and 46,655 solar street lighting installations were provided under a national program; just over 1.4 million solar cookers were distributed in India. The International Solar Alliance (ISA), proposed by India as a founder member, is headquartered in India.

➤ **ENVIRONMENTAL BENEFIT OF SOLAR ENERGY :**

Solar power systems procure clean and pure energy from the sun. Establishment of solar panels on home helps conflict green-house gas emissions and diminish our dependency on fossil fuel. Solar energy offers many benefits over the conventional and alternate energy sources, including no carbon dioxide production, low impact on the environment and climate, no global warming emission, improved public health, in-exhaustive and vast energy supply, creating more job opportunity, stability in energy prices, more resilient and reliable energy sources etc. As an example, a "Solar City" will offset at an average 178 tons carbon dioxide in 30 years, which are equivalent to: (a) planting of trees in full areas of ten football fields, (b) saving the fuels of approx. 390,300 miles, (c) abolishing the burn of 174,907 pounds of coal. Solar power is called "Green Power" and also considered as a clean power.

CONCLUSION:

During last five to ten years, India is facing a big problem with the shortage of electricity. Government of India predicted that the total power demand will expand to 400,000 MW at the end of 2020. It needs enormous additions in capacity of electrical generation to meet the demand and to maintain the progress in the electricity market economy of the country. Considering the large potential, easily availability and other inherent characteristics of solar power, Government of India has given more emphasis on promotion of solar power in Indian power scenario. Currently India is in the top ten ranked countries in the world for investment, capacities addition and creation of job opportunities in solar power. Solar power can also provide a better economic scenario after successful implementation of solar mission for all states of India, especially for some undeveloped states, where the potential of solar power generation is very good but not utilized till date. From the above discussion, it is concluding that the solar power takes an important role in the future power development in India due to the major initiatives and dedication of Government of India.

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