

Forecast Analysis and Availability of Solar Energy in India - A Review

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Abstract

The sun is the most powerful and abundant resource in India. India receives solar radiation of 5000 trillion kWh/year. This radiation can be utilized in photovoltaic and thermal applications. Now, solar power is a major developing industry. The government of India has planned for the implementation of solar cities. This project aims to motivate the local government for adopting new solar technologies and making efficient energy measures. This paper includes the study of solar energy and the consequences faced to install solar power plants in India. It also includes the state wise display of the amount of solar installed. India mainly focuses on developing more number of solar cities by this year. The number of state wise growth is also depicted in this paper. As, the total global solar capacity was 301 gigawatts in 2016 has increased to 320 gigawatts in March 2017. Government has also prepared price distribution in installing more solar power projects in each city.

Keywords: Thermal Application, Solar Cities, Photovoltaic Application

1. INTRODUCTION

India has expanded its solar generation capacity from 2650 MW to 20GW from 26th May 2014 to 31st January 2018. This target was set for the year 2022 but was achieved in 2018 itself which is 4 years ahead of schedule. In the recent years, the solar thermal storage power technology has made cheaper solar power so that it can fulfil the need of people and people no longer have to rely on costly and polluting gas/coal/nuclear based power generation. The usage of solar power in the ways has helped the rural livelihood to a greater extent. The country had a high cost of the solar electricity which in turn has dropped to 18% below the average price which was designed, which has helped many rural livelihoods. The solar target to be set for the year 2018-2019 by the Ministry of Power was of 10.25% of the available power in the year 2020. But the target achieved was just an increase of 6.75% in the year 2018. India has now set a new target of solar power growth to be 15% of the total electricity consumption from the renewable energy sources by March 2022. But in the new report installations of India it is expected to fall by 22% to around 7.5GW in the year 2018 which again causes many problems in the rural livelihoods. The fig1 depicts the growth of solar PV over the years from 2010 - 2018. Over the years from 2010 to 2018 there is massive growth in solar PV which has helped many rural livelihoods. Currently the solar power is 20GW as on 31st January 2018.

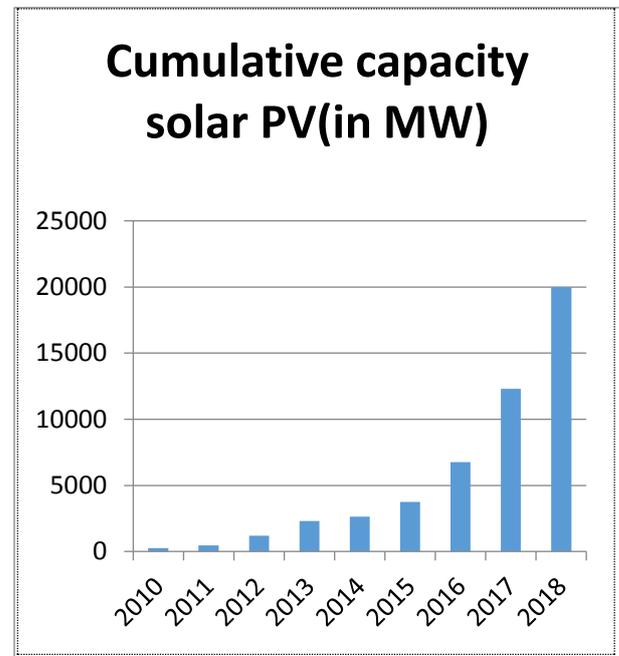


Fig 1:- Solar power over the years from 2010-2018

There are systems whose use has increased the usage of solar power such as solar lanterns, solar home, solar street lights, solar pumps, solar power packs, roof top SPV system etc; which are extremely useful in rural and urban areas which in turn would reduce the burden on conventional fuel usage. The country had a poor rural electrification rate in 2015 where only 55 percent of the rural livelihood had the access to use electricity and 85% depended on solid fuel cooking. In the year 2015, one million solar lanterns were sold which in short reduced the cost of kerosene and 118,700 solar lightning systems were installed in rural households, 46,655 solar street lightning were installed. There were about 1.4million solar cookers distributed in India.

2. SOLAR POWER GROWTH

There is a state wise breakup of the solar power installed over the years.

2.1 Northern region

This fig illustrates that Rajasthan has the most usage of solar power which has being increased over the years. In the northern region Rajasthan is the highest solar consuming state, whereas in Jammu and Kashmir, Chandigarh and Himachal Pradesh are at the least consumption of solar power as of October 2017.

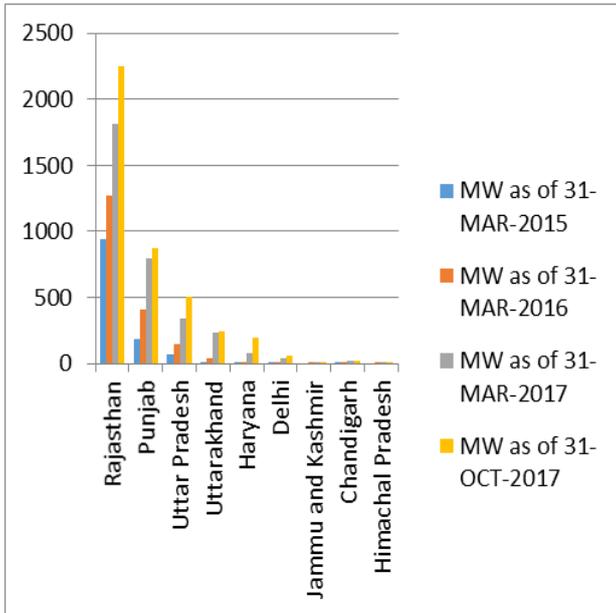


Fig 2:- Solar power in Northern region

2.2 Western region

This fig illustrates that Gujarat has yearly increased its growth in solar power and have being the highest solar consuming state in western region. Secondly, Madhya Pradesh has also increased its growth over the years from 2015 to 2017.

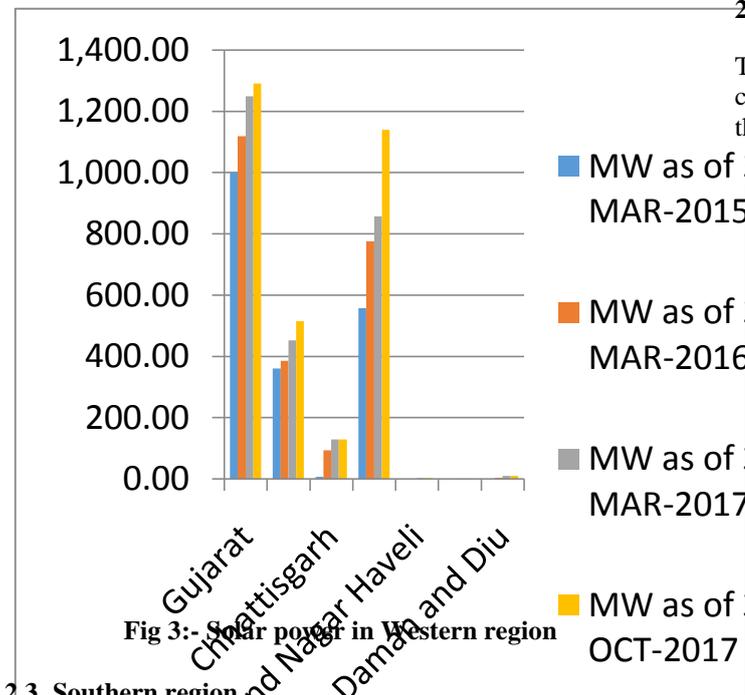


Fig 3:- Solar power in Western region

2.3 Southern region

This fig illustrates the growth of solar power of western region from 2015 to 2017. Telangana being the highest Solar power consuming state. Secondly Andhra Pradesh has most consumption and growth.

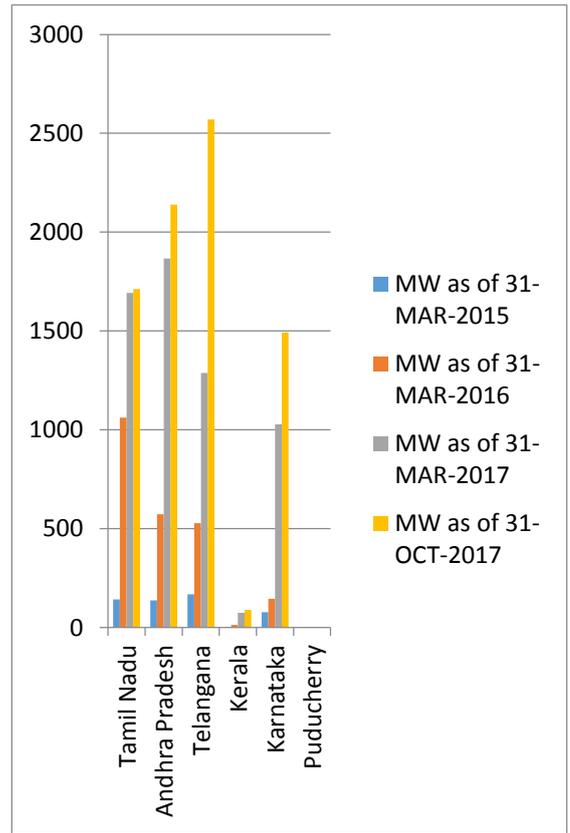


Fig 4:- Solar power in Southern region

2.4 Eastern Region

This fig illustrates that Bihar has the highest solar power consumption over the years 2015-2017. After Bihar, Orissa is the highest solar power consuming state.

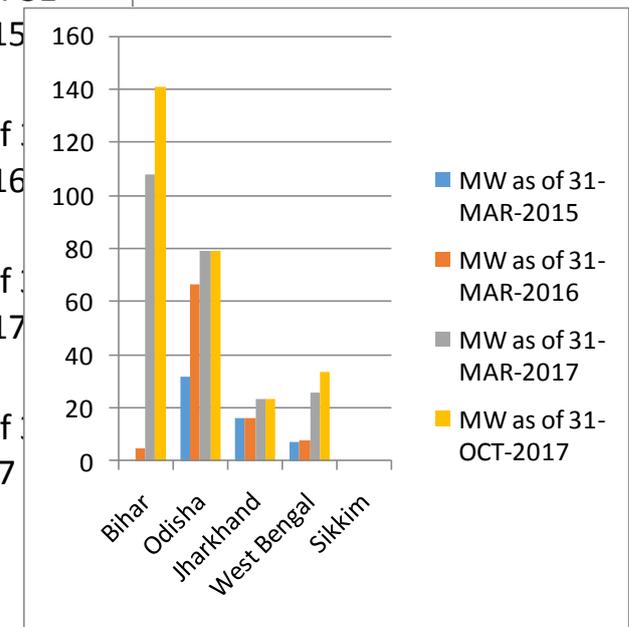


Fig 5:- Solar power in Eastern region

2.5 Indian Islands Region

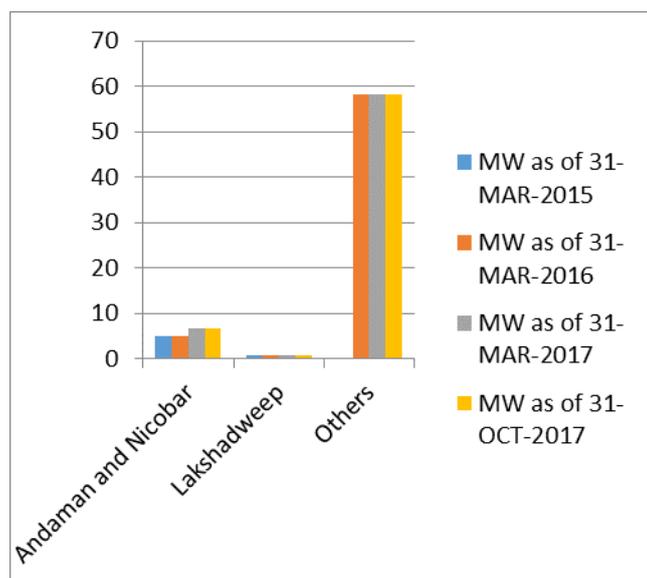


Fig 6:- Solar power in Indian Island region

This fig illustrates the growth of solar power in the Indian islands over the years 2015-2017. Andaman and Nicobar being the highest island in Solar power consumption and Lakshadweep being the second highest Island.

3. FORECAST ANALYSIS OF SOLAR POWER

According to the peen of ministry of India the announced target is to have 40% power generation based on the new technologies by 2030. The future scope of solar has being aimed for 250GW by the end of 2030. There has being reports generated which would enhance the commitment to reduce any emission intensity. Government initiatives has being taken in lowering the solar costs in combination with rising price in grid power where there will be convenient usage of solar energy with a affordable price. The generation based government incentives are available from MNRE which would spend around \$19 billion until 2022.

4. CONCLUSION

The increased growth of solar energy in India has shown the effective growth of India in saving fossil fuels. There are 60 cities government has identified for development of solar cities among which 38 cities are already being sanctioned and the process has started. As seen the growth more projects should be in Rajasthan, Jammu & Kashmir and Uttar Pradesh. Solar roof top energy can be installed which would cut the need up to 50% of every household. As the solar energy requires supportive and productive policies for its continuous growth, there are few challenges which would occur such as land scarcity, latent potential and government support.

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