

SOLAR ENERGY: VIABILITY IN INDIAN CONTEXT

Abstract

Solar energy is one of the emerging and promising renewable energy source which helps in addressing the problems related to environmental challenges and issues leading to sustainable environment possible in the country. India is a developing country and therefore the rapid growth and urbanization calls for an increasing demand for energy and it is where the solar energy can mark its presence as a dominant player in this field. The chapter is focused on a comprehensive analysis of viability of solar energy particularly in a country like ours. The presented chapter focuses on the current status and growth prospects of solar energy in India along with various pros and cons to be considered to accept and adopt as another dimension in the field of renewable energy.

Key words: Solar energy, viability, solar panels, renewable energy, India

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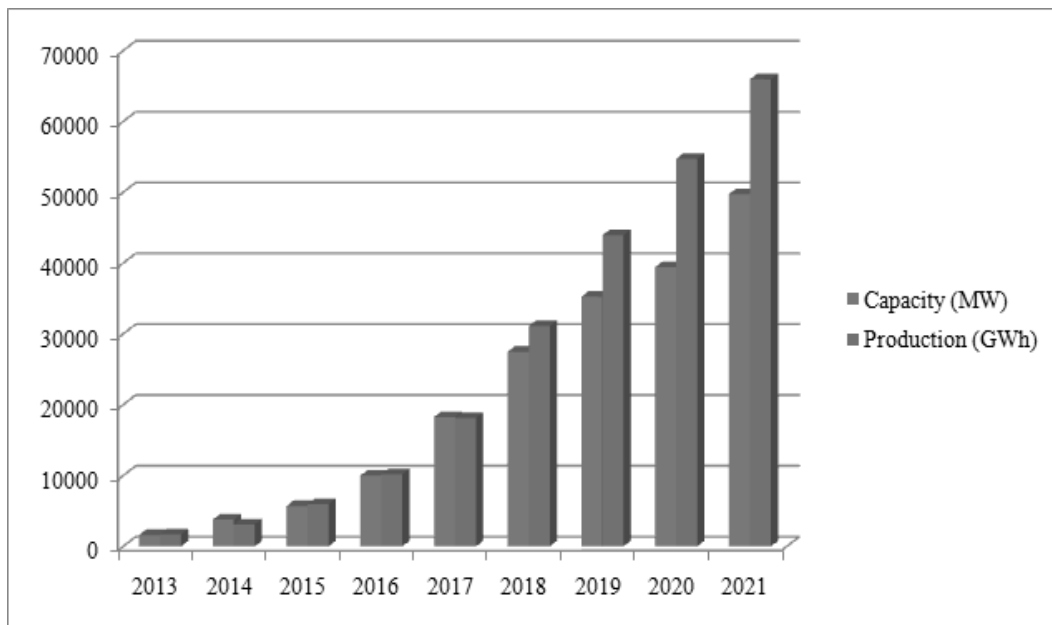
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I. INTRODUCTION

Solar energy is one of the forms of renewable energy with generates and transforms energy present in the sun. The growing need for green energy is the need of the current hour and due to which solar energy has gained popularity [1]. In a country like ours much of the dependence is there on the raw power which is directly increasing the pressure on the supply side of raw power. Therefore the need for an alternative arrangement is on the cards and thus solar energy can be one of the much thoughtful and debatable alternative among the available alternatives. Though the solar energy business appears to be a large upfront expense, but with increasing demand of solar products will undoubtedly a handsome profitable business opportunity in India. Solar segment is expected to be a dominant market in India due to the decreasing cost of solar modules and systems [1,2].

II. GROWTH STATISTICS ON SOLAR ENERGY IN INDIA

| Parameter | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------------------|------|------|------|-------|-------|-------|-------|-------|-------|
| Capacity (MW) | 1603 | 3776 | 5697 | 9982 | 18257 | 27485 | 35250 | 39432 | 49731 |
| Production (GWh) | 1689 | 3104 | 5984 | 10186 | 18135 | 31106 | 43933 | 54729 | 65942 |



Source: <https://www.irena.org/Publications/2023/Jul/Renewable-energy-statistics-2023>

As it is clearly evident from the statistics that there is a continuous growth on both the parameters of solar energy in India which shows the growth potential in this area.

III.SCOPE OF SOLAR ENERGY BUSINESS IN INDIA

According to the National Institute of Solar Energy, India has the potential to generate up to 750 GW of solar energy, which is more than enough to meet the country's energy needs [3]. It is gaining importance in the recent years as a reliable and sustainable source of energy. One of the important points that favors the use of solar energy is the concern towards environment. While other sources may be questioned on the part of sustainable development, solar energy gains points over this concern.

Another important factor that favors the solar energy is the climate of India. Mostly throughout the year India has sunny days which are the major requirement for solar energy generation and use [4].

1. Benefits of Solar Energy

- **Environment Friendly:** One of the biggest arguments in favor of solar energy is that it is environment friendly and thus making the sustainable development reality in practice.
- **Economical:** The costing aspects have shown a significant drop in the recent years with makes solar energy more cost effective compared to traditional fuels.
- **Operating cost:** Another important aspect is the operating cost. Once the solar panel is installed the maintenance cost is minimal and thus reduces the operating cost and making it more affordable.
- **Local generation:** One of the biggest advantages of solar energy is that, it can be generated at local level and thus reduces the transmission losses and dependence on centralized power generation.
- **Reduced dependence on foreign sources:** Due to the possibility of local generation, it reduces the dependence of foreign sources of energy.
- **Job creation:** The continuous growth prospects are an open source of employment generation in India which directly helps in boosting the economic growth of the country.
- **Reach to remote areas:** Solar energy can be used to provide power to the remote areas also with minimal efforts and thus making it accessible to millions of people.
- **More than one use:** Solar energy can be used for variety of uses like, generation of electricity, heating and lighting etc.
- **Reducing dependence on fossil fuels:** By promoting the solar energy government is able to reduce the pressure of dependence on fossil fuels which are much more costly than the solar energy. This will again reduce the overall energy needs and electricity cost for the country.
- **Reducing cost for households and business:** By using solar energy the government is also able to reduce the cost of electricity for both household consumption and business houses. This directly leads to saving of money to these beneficiaries.

2. Demerits of Solar Energy

- **High Installation Cost:** Despite the decrease in cost still the installation of solar panels requires a significant huge amount.

- **Sunlight Dependence:** It is difficult to use the solar panels in the areas where less than ideal levels of sunlight is not present.
- **Installation Difficulties:** The solar panels are generally supposed to be installed on the roofs or on some high altitude places where sun exposure is constantly available. The installation process of panels is tedious and time taking. Again after installation of the panels the wiring process also requires much hard work and time as well.
- **Solar Energy Storage is also Expensive:** The solar energy is stored in solar batteries which are again much more costly which increases the cost of installation.
- **Environmental Impact:** Though the use of solar panels is in favor of environmental issues however the production of solar panels is against the environment. The manufacturing of solar panels creates a considerable amount of greenhouse gases not good for environment.
- **Difficulty with Relocation:** Uninstallation and moving solar panels from one place to another is again a tedious and expensive affair. Many of the components cannot be shifted from one property to another.

- Leading Players in Solar Energy in India
 - Waaree Energies Ltd
 - Tata Power Solar Systems
 - Vikram Solar
 - Adani Solar
 - Microtek Solar Solutions
 - Loom Solar Pvt. Ltd.
 - Moser Baer Solar Ltd
 - EMMVEE
 - RenewSys Solar
 - Icomm Tele Ltd

IV. SOLAR ENERGY CORPORATION OF INDIA (SECI)

SECI is a public sector enterprise and functions under the guidelines of Ministry of New and Renewable energy (MNRE). It was established in 2011 with a primary objective developing and promoting the solar projects in India to support the use of renewable energy in the country.

It is mainly focusing on the implementation of all the solar energy related projects and policies of the government and serves as nodal agency for the procurement of solar power by the government.

V. CONCLUSION

Use of solar energy in India have its own advantages and limitations. However, the increasing trend and growth prospects are forcing to undertake the Solar energy Option and numerous work is undergoing to minimize its disadvantages and make more viable and practical in Indian context. The constant efforts of government and advancements in research and technology will certainly pave the path for adopting solar energy as one of the best options in the field of renewable energy in India.

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