

# SOLAR POTENTIAL IN RAJASTHAN

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## ABSTRACT

India's energy consumption has been increasing rapidly. Conventional energy resources (coal, gas, petroleum, etc.) are exhaustive in nature. Renewable energy introduces to energy resources that include solar, wind, and geothermal energy that renovate it. Solar energy is the fastest growing energy resources in India. Rajasthan has a massive potential of energy which comes from sun. The atmospheric condition of Rajasthan makes it absolute for efficient solar energy generation. Rajasthan has semi-arid climate. Thar desert covers the 66.67% of complete area of Rajasthan. The climatic condition of Rajasthan causes it suitable to undergo approximately 298-330 bright days per year and 6.1 to 6.5 kwh/m<sup>2</sup>/sun radiations per day. The average atmospheric temperature of Rajasthan is between 35 to 41 degrees and in summer days, it crosses above 45 degrees. Rajasthan has a potential of producing 100,000 MW of electricity yearly. Till January, 2016, the solar energy generation capacity is of 1264.35 MW which makes Rajasthan first position in India. In this paper, the authors summarize the availability, current status, target, and problems in solar energy in Rajasthan.

Keywords: Solar Energy, Solar Potential, Solar Photo-Voltaic Array System.

## INTRODUCTION

Current population of India is 1,336,286,256 (1.3 billion) people (May 2016) which makes India second most populous country in the global [1]. India has an annual population growth rate of 1.2% [3]. Energy resources based on fossil fuels are depleting quickly, where India will suffer a large energy scarcity significantly because of the increase in energy prices and insecurity of energy within the upcoming few decades. Large consumption of conventional resources also effect the environmental cause of pollution. A conventional energy resources (coal, oil and petroleum) satisfied the huge demand for energy, which is non-renewable and hence a non-persistent solution to the energy disaster that damages the environment. Therefore, it is crucial that India acquires energy security without disturbing the economy, which would denote that India must utilize non-conventional energy resources rather than conventional energy resources which comes from sun in order to reducing conventional fuel demand and hence protect environment against global warming. Solar energy is

accepted by earth surface of about 1,20,000 (TW). Solar energy is a sufficient energy resource which satisfy current annual local and global energy consumption demand and also in future energy demand [4]. Most absorbable non-conventional energy sources are the energy of solar as that energy used by humans in a whole year, which is more energy from sunlight received by earth in 1 hour. Energy based on fossil fuel reserve are exhaustive in nature and emits carbon, which cause air pollution and global warming, therefore it is limited by increasing the use of renewable energy resources.

### 1. Rajasthan Potential of Solar Energy

Largest state in India is Rajasthan which covers around 10.6% area (geo-graphical). Nevertheless, the newly found hydro-carbon retained in Rajasthan are limited in nature. There are also restricted accessible non-renewable sources of energy as fossil fuels (coal, oil, etc.) [14]. Rajasthan has two continual stream, Mahi and Chambal, potential (hydroelectric) of which approximately completely attained. Therefore, Rajasthan