

# Solar Energy: An Affordable Technology for Sustainable Development

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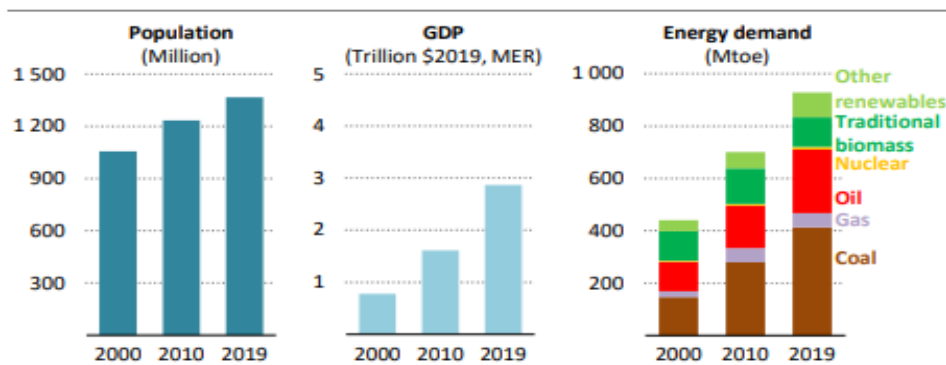
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## Introduction:

Energy is one of the crucial determinants of development. Some economists regard energy as the fourth factor of production in addition to the traditional listing of land, labour and capital. India is a major force in the global energy economy. India stands at fifth position in respect of energy in the world. According to India Energy Outlook 2021 Over 80% of India's energy needs are met by three fuels: coal, oil and solid biomass. Coal has underpinned the expansion of electricity generation and industry, and remains the largest single fuel in the energy mix. Oil consumption and imports have grown rapidly on account of rising vehicle ownership and road transport use. Biomass, primarily fuelwood, makes up a declining share of the energy mix, but is still widely used as a cooking fuel. Despite recent success in expanding coverage of LPG in rural

areas, 660 million Indians have not fully switched to modern, clean cooking fuels or technologies. Increasing industrialization and urbanization in India is increasing demands of its energy sector and its policy makers. Energy use on a per capita basis is well under half the global average, and there are widespread differences in energy use and the quality of service across states and between rural and urban areas. Shailesh explained the close relationship between energy, environment and economic development 1. According to Mohsen no country can enjoy high per capita income without becoming an extensive consumer of energy. Availability of energy is the most important factor in the process of achievement of high economic growth in the country<sup>2</sup>. The following table shows that the Rising population and incomes since 2000 have underpinned a doubling of energy use in India, but per capita energy use is still less than 40% of the world average.

**Selected indicators for India, 2000, 2010 and 2019**



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Source: India Energy Outlook 2021

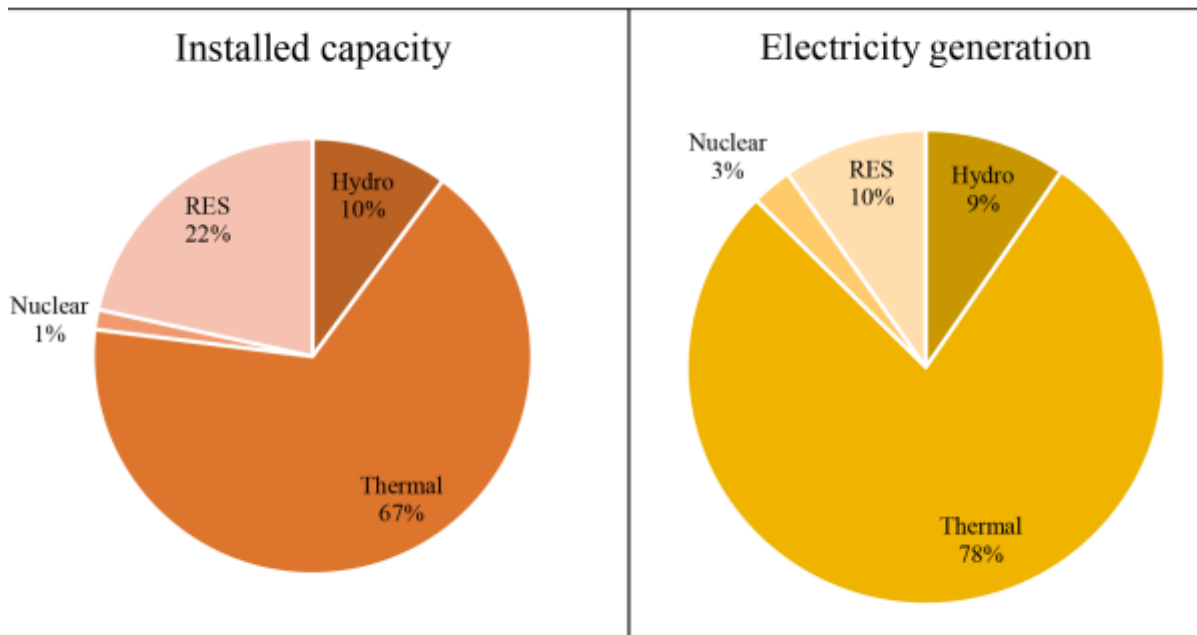
India has the second largest population in the world and having lowest per capita income in the world. India is suffering from energy crisis. Most of need of energy need in India is fulfilled with the Coal and Oil and these are exhaustible sources of energy. To deal with this problem some new strategies have been envisaged. Due to the problem associated with the use of fossil fuel,

alternative sources of energy have become important in today's world. A sustainable energy supply is needed for promoting both economic development and quality life of the society and also protecting the environment. Solar energy is most common and available source of energy. It is available freely all over the world. And most important it does not create pollution.

And therefore, it helps in lessening the green house effect. Now a day most of the people in India particularly in rural Marathwada are suffering from electrical cut off i.e. load shedding and it affects agriculture, industries and other important sectors in the economy. Though we have abundant source of energy like sun we are dependent on

fossil fuels. The following diagram shows that the installed capacity and electricity generation in India. The diagram shows that 78% electricity is generated from the thermal and only 10% renewable energy sources are used for the electricity generation.

**Source of Installed Capacity and electricity generation 2020-21**



Source: Economic Survey 2021-22.

India has witnessed the fastest rate of growth in renewable energy capacity addition among all large economies, during the last 7.5 years with renewable energy capacity growing by 2.9 times and solar energy expanding by over 18 times. Renewable energy excluding hydro constitutes over 24.71 percent of the country's installed power capacity and around 10.7 percent of the electrical energy generation for year 2020-21. As of 31 October 2021, India's total renewable energy installed capacity (excluding hydro power above 25 MW) has reached over 103.05 GW<sup>3</sup>.

**Research Methodology:**

This study is confined two districts of Marathwada region in Maharashtra state of Indian union (Beed and Osmanabad). This study is based on primary and secondary data. A sizeable sample of solar energy technology users and non users was chosen from the districts. 800 users and 800 nonusers were selected by using stratified random sampling technique from the districts. 800 nonusers were selected to know the factors that prevented them from using solar energy devices in their home and at arm also. A questionnaire was administered for

collection of primary data from the chosen samples.

**Results and Discussion:**

The data collected from the selected solar energy plant owners in the districts are to work out the economic feasibility of a solar plant by using NPV, BCR and PBP.

And it was found from the data that the plant is economically feasible because Net Present Value is positive i.e.4424.561, Benefit Cost Ratio is greater that one i.e 1.09 at 10% discount rate. And Pay Back Period is four years. 23.4% users are using it because it saves money, followed by to solve the problem of load shading. and according to 75 users' solar energy is non polluting source o energy. Highest users are of solar water heater i.e.67%, followed by solar home lighting and solar cooker. 14 users are using solar electric pump for agriculture purpose.

The solar energy users from rural area are facing some problems like technical, economical, social and organizational problems while using this technology. As per these problems solar users made some suggestions like, Specific modification

in solar device so that they could be installed it anywhere and would become less expensive, technical support and services should be available at a near place and also increase in subsidy and the process of subsidy should be more simplified.

In case non users out of 800 only 565 respondents are having information about solar system and the subsidy given by government. The main reason behind non adoption of this technology is high cost. And structure of technology. Only 45.5% are having well constructed home, some are living in government quarters and rented home and according to the remaining samples they wish to use the solar technology but because of house structure they can't use it. And they had given certain social and economic reasons of non adoption of solar energy by them.

**Conclusion:**

It could be concluded that though the solar energy is affordable technology for sustainable development, free source of energy, and the pay back period is only four years but still but still the most of the people are not interested for using it. And there are several issues like, high cost, lack of information, lack of technical support. The study showed that the solar users are also facing different technical, economic, social and organizational problems. Hence the government

efforts are needed to promote adoption of solar energy technology by all people to achieve sustainable development in the country.

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