

seen as a milestone in India's journey towards generating 500 GW from renewable energy by 2030, of which 300 GW is expected to come from solar power. India's capacity additions rank the country fifth in solar power deployment, contributing nearly 6.5% to the global cumulative capacity of 709.68 GW.

The major solar installed capacities in India include:

| STATE | SOLAR PARK | CAPACITY |
|----------------|---|--|
| Rajasthan | Bhadla Solar Park, Jodhpur (Largest solar power plant in the world). | 2250 MW |
| Karnataka | Shakti Sthala Pavagada Solar Park, Tumkur (Second largest in the world). | 2050 MW |
| Andhra Pradesh | 1. Kurnool Ultra Mega Solar Park 2. NP Kunta Ultra Mega Solar Park, Ananthapuram | <ul style="list-style-type: none"> 1000 MW 1500 MW |
| Madhya Pradesh | Rewa Solar Power Project (Only one to be funded from Clean Technology Fund and loan from World Bank's IFC) | 750 MW |
| Gujarat | Solar Park I (Chankara Solar Park), Patan | 690 MW |
| Tamil Nadu | Kamuthi solar power plant, Ramanathapuram | 648 MW |

India is also trying to develop a massive 10GW solar power project in Hanle-Khaldo and Pang regions of Ladakh.

Challenges in proper utilisation of solar energy in India are:

- **Intermittency challenge:** Solar energy is unpredictable and location-specific. It cannot provide an on-demand power source 24 hours a week. This poses a challenge in grid integration and creates a requirement for an efficient battery storage system, which is unavailable in India at an affordable cost.
- **High cost and Transmission & Distribution (T&D) losses:** The installation cost is high and T&D losses are approximately at 40%, thereby making solar power less competitive as compared to other energy sources.
- **Manufacturing challenge:** Large-scale utilization of solar energy can only be sustained if it is backed by indigenous research and development, innovation, and manufacturing capability. However, India is still dependent upon imported solar modules and cells.
- **Strain over land resource:** Per capita land availability is already very low in India, while approximately 1 km² of land is required to generate every 20–60 MW of solar energy.

Steps taken by the government to promote solar energy include:

- **National Solar Mission:** It was launched in 2010 with an initial target of 20 GW by 2022, which was later increased to 100 GW. It includes 40 GW through Rooftop and 60 GW through Large and Medium-Scale Grid Connected Solar Power Projects.
- **PM-KUSUM (Kisan Urja Suraksha evam Utthan Mahabhiyan) Scheme:** It was launched in 2019 to provide clean energy to more than 35 lakh farmers by **solarising their agriculture pump** and allowing them to **install distributed grid connected solar projects up to 2 MW** on their barren or agricultural lands.
- **Atal Jyoti Yojana (AJAY):** Scheme for installation of solar street lights with 25% fund contribution from MPLAD Funds.
- **Solar Parks Scheme:** The Ministry of New and Renewable Energy is implementing this scheme for setting up of 50 solar parks of aggregate capacity 40,000 MW in the country. All states and Union Territories are eligible for getting benefits under the scheme. Solar parks are being

