



# Solar Energy Hub in Rajasthan

## Why in News?

**Trade and industry organisations** in Rajasthan have **urged the government to establish** the state as a **hub for manufacturing solar panels**.

- Rajasthan is among the top states in India for generating solar energy.

## Key Points

- The **state's electricity demand is rising** by 8 to 10% annually. The government aims to have 43% of total electricity consumption come from solar energy by 2030.
  - In 2023, solar power plants with a combined capacity of 15,195.12 megawatts (Mw) were set up in the state.
- According to the **Federation of Rajasthan Trade and Industry (FORTI)**, considering the scope in the field of solar energy, the **state government should promote solar panel manufacturing** in the state.

## Solar Panels

- Solar Photovoltaic (PV) technology converts sunlight directly into electricity through the **photovoltaic effect**.
  - The term "photovoltaics" is derived from the conversion of **light (photons)** into **electricity (voltage)**, a phenomenon known as the photovoltaic effect.
- PV cells are made of semiconductor materials like **silicon**. When sunlight strikes the cell, electrons are knocked loose from the atoms, generating electricity.
  - **Grid-connected systems** feed surplus electricity back into the grid.
- In many regions, photovoltaic systems are being deployed at large scales to help power the electric grid.
- **Methods:** PV systems come with small rooftop solar installations, solar pumps, off-grid lighting systems, and large utility-scale solar power plants.
- **Cost-effective:** The costs of PV systems have **fallen dramatically**, making solar power cost-competitive.
  - With weatherproof panels and no moving parts, PV systems require **minimal maintenance** and have **long lifespans**.
- **Drawback:** Solar PV generation relies on **sunny weather** and output varies throughout the day.