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India's Solar Energy: Bottlenecks and 2030 Target

India's solar capacity has boomed, but faces challenges like US tariffs, cell shortages, and grid imbalances.

A discussion on the challenges and bottlenecks in India's rapidly expanding solar energy sector, crucial for achieving its 2030 non-fossil capacity target.

KEY EXAM POINTS

- India's solar capacity expanded rapidly in the **past decade**, growing from under **3 GW** in **2014** to **168 GW** by **August 2026**.
- In **FY26**, the country installed **44.6 GW** of solar capacity, nearly **double** the previous year's installation.
- Steep **US tariffs** on **solar cells and panels** from **India**, **Indonesia**, and **Laos** threaten the rapidly growing industry.
- India's factories produce more **solar modules** than needed but too few of the critical **cells** that go into them.
- The **national grid** faces challenges absorbing **surplus solar power** at noon, and the cost of **battery storage** is increasing.
- India aims to achieve **500 GW** of **non-fossil energy capacity** by **2030**, which depends on resolving these imbalances.

DID YOU KNOW..!?

The **International Solar Alliance (ISA)** was launched jointly by **India** and **France** in **2015** at the **COP21** summit in **Paris**.

The **National Solar Mission**, launched in **2010**, is one of the eight missions under India's **National Action Plan on Climate Change (NAPCC)**.

India's initial target was to achieve **175 GW** of **renewable energy capacity** by **2022**, including **100 GW** from **solar power**.

Solar cells convert sunlight directly into electricity using the **photovoltaic effect**, typically made from **silicon**.

The **Ministry of New and Renewable Energy (MNRE)** is the **nodal agency** for all new and renewable energy-related matters in India.

Grid integration of **intermittent renewable sources** like solar power requires advanced grid management and **energy storage solutions**.

Tamil Nadu is a leading state in **renewable energy**, with significant contributions from **solar and wind power**.

The **state government** promotes **solar energy** through various policies and incentives, including **rooftop solar schemes**.

REVISION FLASHCARD

India aims for 500 GW non-fossil energy capacity by 2030, facing solar sector bottlenecks like US tariffs and cell shortages.

Syllabus Relevance: High

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