

## India's Solar Power Dream

### Why in news?

From less than 10 MW in 2010, India has added significant photovoltaics capacity over the past decade, achieving over 50 GW by 2022.

### What is India's status and target on solar energy?

*The Indian renewable energy sector is the fourth most attractive renewable energy market in the world with fifth rank in solar power, as of 2020.*

- **Current status-** India's current solar module manufacturing capacity is limited to **15 GW** per year.
- India only produces 3.5 GW of cells currently.
- India has no manufacturing capacity for solar wafers and polysilicon ingots, and currently imports 100% of silicon wafers and around 80% of cells even at the current deployment levels.
- Also, out of the 15 GW of module manufacturing capacity, only 3-4 GW of modules are technologically competitive and worthy of deployment in grid-based projects.
- India remains dependent on import of solar modules for field deployment.
- **Target-** By 2030, India is targeting about **500 GW** of renewable energy deployment, out of which 280 GW is expected from solar PV.
- This necessitates the deployment of nearly 30 GW of solar capacity every year until 2030.



### What is the current government policy on solar technology?

- The government is rolling out various policy initiatives to push and motivate the industry to work towards self-reliance in solar manufacturing, both for cells and modules.
- Key initiatives include
  - A 40% duty on the import of modules
  - 25% duty on the import of cells
  - PLI scheme to support manufacturing capex
- It is mandatory to procure modules only from an approved list of manufacturers (ALMM) for projects that are connected to state/ central government grids.

### What are the challenges in reaching the target?

*More than 90% of the world's solar wafer manufacturing currently happens in China.*

- **Land-** Land, the most expensive part of solar projects, is scarce in India.
- **Raw material-** There is a huge gap on the raw material supply chain side as well.
- Silicon wafer, metallic pastes of silver and aluminium, etc. is not manufactured in India.
- **Nature of Indian hubs-** India is more of an assembly hub than a manufacturing one.
- **Access to technology-** It is unlikely that companies that have spent millions of dollars on in-house and external R&D would make it easy for India to access the latest technologies easily or at a lower cost.
- India has hardly invested in creating high-quality high-TRL technology centres such as IMEC Belgium or the Holst Centre in the Netherlands.

### **What is the way forward?**

- The path to become a manufacturing hub for the same requires more than just putting some tax barriers and commercial incentives in the form of PLI schemes, etc.
- It needs strong industry-academia collaboration to start home-grown technologies which could work with the industry to provide them with trained human resource, process learnings, root-cause analysis through right testing and to develop India's own technologies.
- High-end technology development requires substantial investment in several clusters which operate in industry-like working and management conditions.
- India needs to create high-quality high-TRL technology centres to work on specific technology domains with clear roadmaps and deliverables, monitored by specialists from industry and academia.

### **References**

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