India’s Solar Power Dream

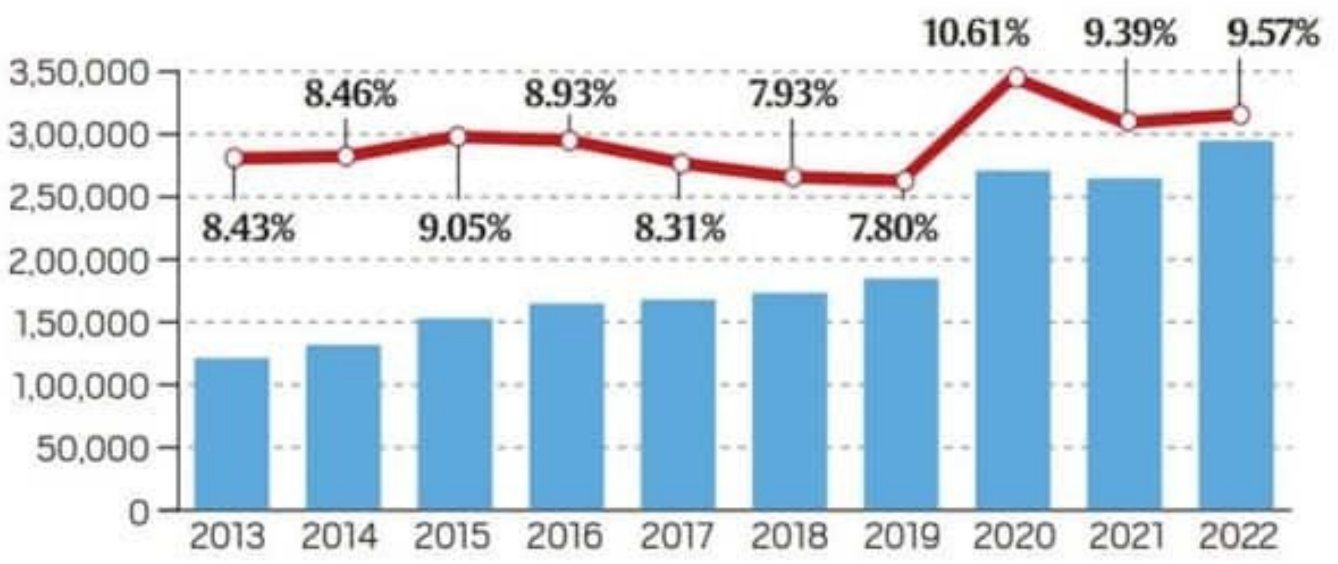
Why in news?

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

1. https://indianexpress.com/article/explained/experts-explain-what-it-will-take-to-fulfill-indias-solar-power-dream-8078876/
2. https://www.ibef.org/industry/renewable-energy