

## National Programme on High Efficiency Solar PV Modules

### Why in News?

- The union cabinet approved the Production Linked Incentive Scheme (PLI) (Tranche II) on 'National programme on High Efficiency Solar PV Modules'.

### About Solar Photovoltaics (PV) manufacturing in India

- Currently, India's annual installed solar PV manufacturing capacity is 3 GW for solar PV cells, **10-15 GW for solar PV modules**, **5 GW for solar inverters** while we have **no manufacturing capacity for "polysilicon/wafer/ingots"**, another critical component in case of solar power systems.
- The government plans to create an additional domestic manufacturing capacity of 25GW each of solar cells and modules, and 10GW of wafers by **April 2023**.
- **China** accounts for over **80% of India's import bill** for solar PV cells and modules.

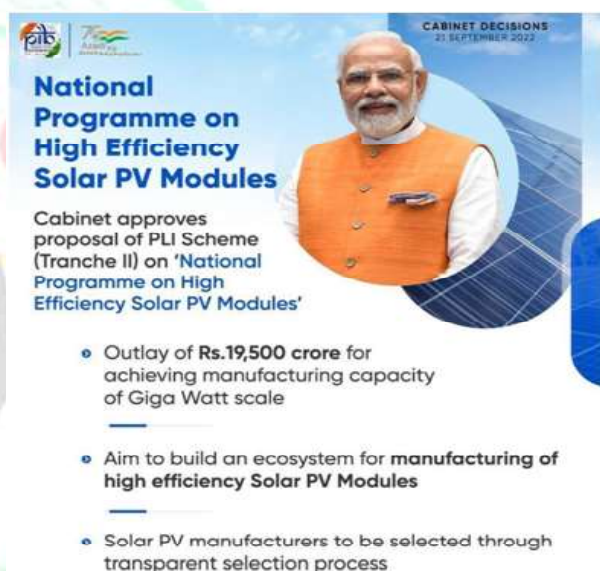
### Highlight of Programme

**Objective:** It aims to build an ecosystem for manufacturing of high efficiency solar PV modules in India.

- **Outlay:** It was approved with an outlay of **Rs.19,500 crore** for achieving manufacturing capacity of **Giga Watt (GW) scale** in High Efficiency Solar PV Modules.
- **Plan of the scheme:**
  - Solar PV manufacturers will be selected through a **transparent selection process**.
  - PLI will be disbursed for **5 years post commissioning** of solar PV manufacturing plants on sales of high efficiency solar PV modules from the domestic market will be incentivized.
- **The outcomes/benefits expected from the scheme:**
  - It is estimated that about **65GW per annum manufacturing capacity** of fully and partially integrated, solar PV modules would be installed.
  - The scheme will bring **direct investment** of around Rs.94,000 crore.
  - Creation of manufacturing capacity for **Balance of Materials** like EVA, Solar glass, Backsheet, etc.
  - It will generate **direct employment** for around 2 lakh persons and **indirect jobs** for around eight lakh persons.
  - **Import substitution** of approximately Rs.1.37 lakh crore.
  - Impetus to **Research and Development** to achieve higher efficiencies in Solar PV Modules.
- **Significance:**
  - **Reduce import dependence** in Renewable Energy.
  - It will strengthen our goal of **Atmanirbhar Bharat** and generate employment.

### Challenges in solar PV manufacturing in India

- **High import dependence:** Over 80% of India's demand for solar PV cells and modules is met through imports.
  - Several raw materials such as **silicon wafers, metallic pastes of silver and aluminium** to form the electrical contacts too, are almost **100% imported**.
- **Low efficiency:** Currently in India, 90% of the current solar photovoltaic (PV) panel installations are based on **crystalline silicon**, which maxes out at about **22% efficiency**.
  - There are other technologies being developed such as '**Perovskite crystal coated panels**' which can bring up this efficiency to about **27%**.
- **Obsolete technology:** The majority of domestic production (60-70%) of solar PV in India employs **multi-Si module technology** – which is nearing obsolescence, leading to low capacity utilization in factories.



- **Competitiveness:** 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**.
- **Poor R&D:** India has hardly invested in creating high-quality **high-TRL technology** centers such as **IMEC Belgium or the Holst Centre in the Netherlands**, which can help the industry to **try and test** the technologies in a cost-effective manner.
- **Lack of coordination between center and states:** Lack of cohesive renewable energy policies among centre and state governments and **frequent fluctuations in policies** have stalled the growth of solar installations mainly in the open access and rooftop solar market in India.

#### **Government initiatives to boost solar PV manufacturing in India**

- **Production Linked Incentive Scheme** on 'National programme on High Efficiency Solar PV Modules'.
- India has implemented a **40% duty on the import of modules** and **25% duty on the import of cells**.
- Government has made it mandatory to procure modules only from an **approved list of manufacturers (ALMM)** (till now only India-based manufacturers have been approved) for projects that are contracted to state/ central government grids

