Solar Waste

For Prelims: Solar Waste and its examples , Related initiatives

For Mains: Management of Solar Waste in India and other parts of the World, Challenges Posed by Solar Waste, Suggestions, Related Initiatives.

Why in News

According to a report by the **National Solar Energy Federation of India (NSEFI)**, India could generate over 34,600 tonnes of cumulative **solar waste** in India by 2030.

- India does not have a solar waste management policy, but it does have ambitious **solar power installation targets.**
- NSEFI is an umbrella organisation of **all solar energy stakeholders of India.** Which works in the area of **policy advocacy and is a National Platform for addressing all issues connected with solar energy growth** in India.

Key Points

- **About:**
  - Solar wastes are the **electronic waste generated by discarded solar panels.** They are sold as scrap in the country.
  - It can increase **by at least four-five-fold by the next decade**. India should focus its attention on drafting comprehensive rules to deal with solar waste.
- **Report:**
  - It is likely that India will be faced **with solar waste problems by the end of this decade,** and solar waste will end up being the most prevalent form of waste in landfills soon.
    - Solar panels have a **life of 20-25 years, so the problem of waste seems distant.**
  - While **photovoltaics** generate only about **3 % of global electricity, they consume 40 % of the world's tellurium,** 15 % of the world's silver, a substantial chunk of **semiconductor**-grade quartz and lesser but still significant amounts of indium, zinc, tin and gallium.
  - The market value of raw materials recovered from solar panels **could reach USD 450 million by 2030.**
  - The value of **recoverable materials might surpass USD 15 billion by 2050,** which would be enough to power 630 GW with two billion solar panels.
    - Globally, it is expected that **End-of-Life (EoL) of solar panels will drive the solar panel recycling business** in the next 10-20 years.
- **Other Countries Handling Solar Waste:**
  - **European Union:**
    - The **Waste Electrical and Electronic Equipment (WEEE)** Directive of the **EU (European Union)** imposes responsibility for the **disposal of waste on the**

manufacturers or distributors who introduce or install such equipment for the first time.
        - PV (Photovoltaic) **manufacturers are solely responsible for the collection, handling and treatment of modules** at the end of their lifecycle, according to the WEEE Directive.
    - **UK:**
        - The UK also has an **industry-managed "take-back and recycling scheme",** where all PV producers will **need to register and submit data related to products** used for the residential solar market (Business-to-Consumer) and non-residential market.
    - **USA:**
        - While there are no federal statutes or regulations in the US that talk about recycling, **there are some states who have proactively defined policies to address end-of-life PV module** management.
        - Washington and California have come up with **Extended Producer Responsibility (EPR) regulations.** Washington now requires **PV module manufacturers to finance the take-back and reuse or recycling of PV modules** sold within or into the state at no cost to the end-user.
    - **Australia:**
        - The federal government In Australia has acknowledged the concern and announced a USD 2 million grant as **part of the National Product Stewardship Investment Fund** to develop and implement an industry-led product stewardship scheme for PV systems.
    - **Japan and South Korea:**
        - Countries such as Japan and South Korea have already indicated their resolve to come up with **dedicated legislation to address the PV waste problem.**
- **Recommendations:**
    - **Strong e-waste or Renewable Energy Waste Laws:** EPR for the **manufacturer and developers to take responsibility for end-of-life the solar panel.**
        - PV modules were the first to be included in the EU's WEEE regulations. It includes options for financing waste management.
    - **Infrastructure:** To bring down the cost of recycling infrastructure **investment is required, coordination between the energy and waste sector to efficiently handle the renewable energy waste** and build more recycling plants to avoid solar panels ending up in landfills.
    - **Environmental Disposal and Recycling: Environmental disposal and recycling** of solar waste could be part of the power purchase agreement SECI / DISCOMS / government signs with project developers.
    - **Ban on Landfills**: Solar panel waste is harmful to the environment as it contains toxic metals and minerals that may seep in the ground.
    - **Business Incentives: New business models,** incentives or issues of green certificates to be provided to encourage the recycling industry to participate more.
    - **Research and Development:** Innovation in design may have an impact on the type of waste they generate; technology advancements will be significant in reducing the impact of renewable energy waste. New panels, for example, use less silicon and produce less waste during the manufacturing process.
- **Related Indian Initiatives:**
    - **Draft EPR Notification: Plastic Packaging Waste.**
    - **Plastic Waste Management Amendment Rules, 2021.**
    - **E-Waste (Management) Rules, 2016.**
    - **E-waste (Management) Amendment Rules, 2018.**
    - **Central Pollution Control Board.**

Source: DTE