Thin-Film Solar Industry Association (PVthin) a.i.s.b.l.

PVthin's response to the Indian Ministry of Environment S.O. 360(E) Notification – Including photovoltaics in Indian E-Waste rules

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The Secretary,
Ministry of Environment, Forest and Climate Change
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Executive summary

- At the moment, the Indian E-Waste rules include both an obligation to collect and treat electronic waste (WEEE) and a requirement that electronic goods not include certain chemical substances (RoHS). They exclude PV panels.
- All countries in the world who have adopted end of life legislation for electronic equipment, have excluded PV from the RoHS chemical requirements because the industry is so strategic, and innovations in PV panel chemical compositions are imminent.
- Were India to include PV in its current E-Waste rules, and apply chemical content requirements to PV, it would have significant consequences on Indian energy security and solar industrial ambitions.
- Other regulatory approaches are better suited to the PV industry: India's recent Extended Producer Responsibility scheme for tyre waste is a model worth investigating.

PVthin, the Thin-Film Solar Industry Association, welcomes the opportunity to provide comments on India's Ministry of Environment, Forest and Climate Change new E-Waste (Management) Rules proposal - S.O. 360(E). Thin-film photovoltaics (PV) provide superior performance, lower costs, smaller environmental footprints, and high resource efficiency and recyclability.

Today, the Indian E-Waste Rules include both an obligation to collect and treat electronic waste (cf. the EU's Waste of Electrical and Electronic Equipment, WEEE) and a requirement that electronic goods do not include certain chemical substances (Restriction of Hazardous Substances, RoHS). The current E-Waste rules do not refer to PV panels. However, if the new E-Waste proposal is adopted and rule 21(1) is applied to PV, the vast majority of PV panels available in India will not meet the RoHS requirements and will not be able to be sold on the market.

Every country that has adopted end-of-life legislation for electronic equipment (EEE) has excluded PV from the RoHS chemical content requirements due to the importance of the industry to meeting climate ambitions; because the technology is professionally installed for use at a defined location and is safe, sustainable, and economically viable; and because the chemical composition of PV technology is changing rapidly.

The PV industry is on the verge of taking innovations, which have been present in research laboratories for years, to the market. This means that PV panels sold in India soon will have a dramatically different, and more complex, chemical composition than what can be seen on the market today.

Including PV in Indian E-Waste rules, thereby imposing RoHS-like requirements on PV technology as proposed in the current draft, would create a negative spiral, exacerbated by growing uncertainty within the sector, which would result in fewer investors contributing to PV panel R&D. Although this would result in a slowdown in the development of all PV panel technologies, this would be felt more acutely by innovative technologies such as tandem solar cells.

This would not only have severe impacts on the speed at which new thin-film and tandem technologies (e.g., perovskites) can be sold on the PV market, but it would also stop the next novel PV panel technology from being sold in India.

Since other jurisdictions do not subject PV panels to RoHS requirements, PV panel producers and developers in India would be at a disadvantage to their peers in other markets who will have access to better performing PV technology. Such a trend would likely undermine foreign investment in the Indian PV market going forward.

Instead of E-Waste, other regulatory approaches are better suited to managing PV at end of life in India. These include Extended Producer Responsibility (EPR), landfill bans, effective collection schemes, information sharing among recyclers and manufacturers, as well as health and safety measures during end-of-life processing.

These regulatory approaches are proven to be effective and the safety of PV modules over their lifecycle has been widely demonstrated, including in extraordinary circumstances such as fires, storms and floods[1]. Once they reach their end of life, thin-film PV modules can be recycled to recover over 90% of their glass and semiconductor metals[2]. Semiconductor metals are then reused in new thin-film PV modules, in closed-loop systems.

[1] IEA PVPS Task 12. Human Health Risk Assessment Methods for PV: Parts 1-3. Available at: https://iea-pvps.org/keytopics/ehs-recycling/

[2] IEA PVPS Task 12. Life Cycle Assessment of Current Photovoltaic Module Recycling. https://iea-pvps.org/key-topics/life-cycle-assesment-of-current-photovoltaic-module-recycling-by-task-12-2/

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Were India to include PV in its E-Waste law, as laid out in the current notification text, it would have disruptive and long-lasting consequences on India's solar ambitions, its future energy security, and impact on current investments in domestic manufacturing.

India has vast solar energy potential. Solar energy has taken a central place in India's National Action Plan on Climate Change and the National Solar Mission aims to establish India as a global leader in solar energy by creating the policy conditions for solar technology diffusion across the country as quickly as possible.

Experts have already warned that India will not achieve its targets of increasing its non-fossil energy capacity to 175 gigawatts by 2022 and 500 GW by 2030. If RoHS requirements were imposed on PV panels, India would not be able to meet its objective to become a global leader in solar energy or fulfill its energy security ambitions.

Hence, in order to avoid far-reaching prohibitions on the sale of most commercial photovoltaic panels while preserving the EPR requirements for PV panels, we recommend the adoption of either of two approaches described below: **(i) In sub-rule (7) of rule 21, PV should be added to the list of equipment excluded from the provisions of sub-rule (1) of rule 21; or ii) regulate PV waste outside the E-Waste rules by using a stand-alone EPR regulatory regime.** Either approach would be consistent with the **strategic importance of PV to India's national energy security and its domestic manufacturing industry, as well as international precedent** (e.g., exclusion of PV from the scope of EU RoHS, but its inclusion in EU WEEE).

Suggested new text [in brackets]:

"(7) Manufacture and supply of electrical and electronic equipment used for defense and other similar strategic applications [; and photovoltaic panels intended to be used in a system that is designed, assembled and installed by professionals for permanent use at a defined location;] shall be excluded from provisions of sub-rule (1) of rule 21."

About PVthin

PVthin - the International Thin-Film Solar Industry Association - is an international, not-for-profit coalition representing global leaders in the Thin-Film Solar Industry and broader value chain based on chalcogenide, perovskite, tandem and/or heterojunction PV technologies, and any other thin-film or emerging PV technology. For further information about our position on RoHS, please contact us at Secretariat@pvthin.org.

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