

## Improvements in PV recycling are necessary to meet strong future demand

With rapid PV deployment around the world, comes corresponding PV waste; but are countries prepared and what regulatory and technological approaches should each country integrate? A new report from the IEA PV Power Systems programme investigates PV end-of-life (EOL) practices and has found that further improvements in PV EOL processes are required to meet future demand and to realise high-value, low-cost recycling. Additionally, regulatory, and technological approaches need to be well integrated and adapted to the conditions of each country or region.

Australian co-author of the report, Dr Rong Deng says, “Australia is expected to have more than 10,000 tons of waste solar panels by the mid-2020s mainly coming from replacement of residential PV systems and the volume will surge after 2030. Local waste recycling industries and governments have started taking collaborative and technology-driven approaches to deal with it sustainably.”

Currently, there are no recycling or product stewardship requirements for PV modules, inverters, and batteries in any state or territory in Australia; however, PV systems are a “listed class of products” to consider under the Product Stewardship Act. An activity to evaluate the inclusion of PV systems in the national stewardship program was led by Sustainability Victoria, a statutory authority with a board appointed by the Minister for Energy, Environment and Climate Change. The findings published in 2019 show that either voluntary or co-regulatory approaches for PV modules might be feasible in Australia and are likely to achieve the environmental, health, and safety objectives of the Product Stewardship Act, improving the management of EOL PV modules and opportunities to reuse valuable materials.

More recently, the Product Stewardship Centre of Excellence led 6 meetings with the Industry Working Group from January to March 2022 on the co-design of a product stewardship scheme for PV systems. The outcomes from these meetings, *recognising that stronger government intervention will be beneficial*, have been submitted to the Department.

Elsewhere, all producers with PV modules in the EU market are required to either operate their own take-back and recycling scheme or to join what are known as producer compliance schemes. In South Korea, the Extended Producer Responsibility (EPR) regulations will be enforced in 2023. In the United States, regulations specific to PV waste exist in some states. Even in Japan and China, where there are no compulsory PV-specific regulations at this time, several discussions, and activities for supporting PV EOL have been carried out.

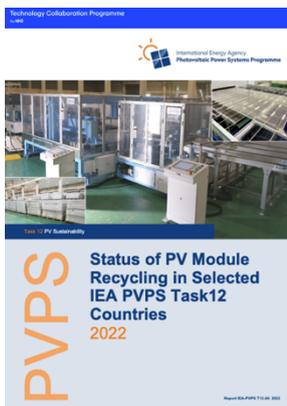
In the coming decades, PV waste will increase faster than anticipated. The total amount of PV module waste internationally is still small, but the current situation is

not suitable to deploy PV module recycling in the long term. To meet and optimise the end-of-life management of PV waste, regulatory and technological approaches should be well integrated, and their potential options should be adapted to the conditions of each country or region.

With this in mind, the 3<sup>rd</sup> Australia PV End-of-Life Management and Sustainability Workshop will be run as a parallel session during Asia Pacific Solar Research Conference (APSRC) in Newcastle from 29<sup>th</sup> Nov - 1<sup>st</sup> December in the Renewable Deployment and Integration stream. The two-hour session will cover the latest updates from local industry, product stewardship, and researchers and includes the following presentations:

1. Solar panel waste projection in Australia, 2022-2035
2. Esha Thapar: Evaluating the Feasibility and Environmental Impacts of End-of-Life Management Strategies for Photovoltaic Modules
3. Sustainability at 5B and the circularity of the 5B MAVERICK
4. End-of-life PV collection and recycling in NSW by PVIndustries
5. Scipher advanced solar panel recycling
6. Updates on national product stewardship scheme design for solar panels, batteries, and inverters.

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### Full Report

### **Status of PV Module Recycling in Selected IEA PVPS Task12 Countries 2022**

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### **About the APSRC**

The APSRC provides a regional forum for communicating research outcomes covering all aspects of solar-related research: PV devices, concentrating solar thermal, deployment & integration, solar heating & cooling as well as solar fuels and chemistry. With the theme of information, communication and integration, the conference provides a great opportunity for young researchers and professionals to share knowledge and network with the region's leading innovators from industry and research institutions. **For more about the APSRC visit the APVI website [HERE](#)**

## **About the IEA PV Power Systems Programme Task 12**

Australian Engineer Dr Jose Bilbao of UNSW is the Deputy Task Manager for the International Energy Agency Photovoltaic Power Systems Programme (IEA-PVPS) Task 12. This program aims to foster international collaboration and knowledge creation in photovoltaic (PV) environmental sustainability and safety. The Australian PV Institute, with support from ARENA, leads Australia's engagement in the IEA PV Power Systems program and works with its members to increase the uptake of PV through quality research, data, and analysis.

## **About the APVI**

The Australian PV Institute is a not-for-profit, member-based organisation which focuses on data analysis, independent and balanced information, and collaborative research. Our objective is to support the increased development and use of PV via research, analysis, and information. The APVI promotes solar through its live solar mapping platform [<http://pv-map.apvi.org.au>], the national solar research conference and Australia's participation in two International Energy Agency (IEA) programs – PVPS (Photovoltaic Power Systems) for solar photovoltaics and SHC (Solar Heating and Cooling), concerned with new solar thermal products and services. [www.apvi.org.au](http://www.apvi.org.au)