

# **Assessing the Environmental and Health Risks Associated with Solar Panel (PV) Systems Waste Disposal to Landfills in Australia**

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## **Abstract**

Throughout Australia Photovoltaic (PV) systems which include solar panels, inverters and batteries are increasingly being installed in homes and business premises in astonishing numbers. According to Sustainability Victoria, more than 100,000 tons of discarded solar panels, inverters and batteries is anticipated to enter Australia's waste stream by 2035 creating enormous social, environmental and health risks as a result of inappropriate recycling and disposal practices in the communities. Although Australian states and territories have recognized the ongoing issues of solar panel (PV) systems waste and introducing policies and regulations that can help manage this waste stream, large quantities of discarded solar panels still go unaccounted for and are mounting up in landfills mostly in regional areas. Currently, local governments are concerned about discarded solar panel disposal to landfills and are struggling to come up with appropriate disposal strategies and approaches. Adding to the growing issue of waste generated from PV systems is the absence of committed processing facilities in Australia with capability and technological innovation to recover valuable materials contained in PV products. The purpose of this research is to critically examine environmental and health risks associated with solar panel (PV) systems waste disposal to landfills, create awareness and develop innovative approaches to address the ongoing issues on solar panels collection and recycling in Australia. This study is conducted in collaboration with Australian regional councils and an online survey questionnaire is used for collecting the required data. The findings of this study contributes to an emergent body of

research on the environmental and health risks associated with inappropriate disposal of solar (PV) panels in landfills to documents that residents in the communities are exposed to a number of toxic/hazardous substance emanating from inappropriate disposal of solar (PV) panels some at potentially concerning levels.

## **Keywords**

Photovoltaic (PV) systems waste management, Photovoltaic (PV) systems waste disposal, Environmental and health risks, Landfills and Australia

## **Biographies**

**Lynda Andeobu** is currently Lecturer – ICT in the School of Engineering and Technology at CQUniversity. Dr Andeobu is an active researcher and has published several research papers in reputed international research conferences, refereed journals and book chapters. Her research interests include green ICT, electronic waste management, sustainability, artificial intelligence, information systems analysis, blockchain technologies, IoT, network and cybersecurity.

**Santoso Wibowo** is currently an Associate Professor - ICT and a Postgraduate Research Coordinator for the School of Engineering & Technology at CQUniversity. His research interests are in the areas of intelligent information systems, multicriteria decision analysis, image processing, knowledge management and e-learning. He has published in several international refereed journals such as Computers and Industrial Engineering, Computers and Mathematics with Applications, Expert Systems with Applications, International Journal of Fuzzy Systems, Waste Management, Journal of Cleaner Production and Science of the Total Environment as well as book chapters for Lecture Notes in Artificial Intelligence, Lecture Notes in Computer Science and Lecture Notes in Electrical Engineering.

**Srimannarayana Grandhi** is an Associate Professor and the Head of College, in the College of Information and Communications Technology. Dr Grandhi is an active researcher with research interests in educational technology, technology adoption, sustainability and multicriteria decision making. He has published several papers in reputed international conferences, and refereed journals and also participated in collaborative book chapters. He is currently teaching Blockchain technologies and Enterprise systems at Undergraduate and Postgraduate levels and supervising research students. Over the years, Dr Grandhi has published research papers at Excellence in Research for Australia (ERA) listed conferences and journals. He is also a guest editor for the special issue (Environmental Research and Public Health) of the International Journal of Environmental Research and Public Health.