

EVALUATION OF ENVIRONMENTAL IMPACTS OF SOLAR PV SYSTEMS WITH CONCEPTUAL LIFE CYCLE ASSESSMENT AND RECYCLING OF END-OF-LIFE PV PANELS

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Although numerous dialogues on the recycling processes of PV panels have been in the limelight, their progress has been slow due to the lack of institutional support and the lack of robust legislation within countries. Given the slow progress in PV recycling, this thesis attempts to analyse the evaluation of the environmental impacts of solar PV systems with conceptual life cycle assessment and recycling of end-of-life PV panels. This thesis will be based on the reflective analysis of information mainly gathered through a comparison study of secondary journal articles and an inventory of carbon and energy.

This analysis focuses on the carbon emissions associated with various phases of a solar PV system, including manufacturing, transportation, installation, and operation. By using embodied carbon coefficients, the study quantifies the CO₂ intensity (kgCO₂/kWh) for each phase and reveals valuable insights into their environmental impact. The findings highlight the significance of optimising the installation process and exploring greener transportation alternatives to reduce the system's carbon footprint.

The study also emphasises the importance of implementing effective end-of-life management strategies, promoting material recovery, and reducing demand for new materials to achieve overall embodied carbon emission reductions. To address the growing concern of solar PV panel waste, the establishment of a comprehensive framework for PV end-of-life management in Sri Lanka is essential. Creating accountability through collective responsibility, government support, and producer involvement is crucial to promoting recycling and ensuring sustainable practices. Financial support from the government is vital to encourage recycling initiatives, and establishing provincial collection points can further facilitate the recycling process.

Keywords: End-of-Life, PV, Solar, PV waste, Solar Energy, Environmental impacts, Recycling of PV, Framework, Conceptual Life Cycle Assessment

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Evaluation of Environmental Impacts of Solar PV Systems with Life Cycle Assessment and Recycling of End-of-Life PV Panels

This research will assess the environmental impact of PV panels, using a method called Conceptual Life Cycle Assessment and Recycling of End-of-Life PV panels. It will address the absence of a regulatory framework for the disposal and recycling of solar PV panels on the new solar parks in Sri Lanka by creating a policy framework for the disposal and recycling of solar panels.

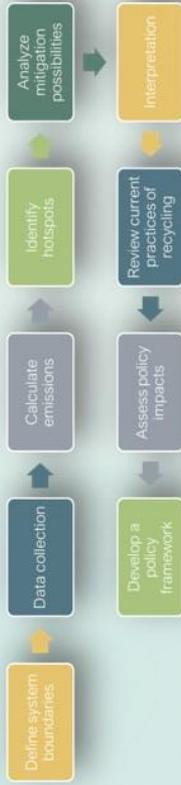
1. Objectives

-  A Conceptual LCA (Embodied Carbon) on PV panels will be provided
-  Development of more efficient and sustainable recycling technologies for end-of-life PV panels
-  Propose a policy framework for recycling PV panels in Sri Lanka

3. Resources



2. Methodology



Conclusion

- A study analyzing the carbon emissions of solar PV systems highlighted the significant impact of installation and transportation phases on overall emissions.
- The research emphasized the efficiency and feasibility of recycling methods that can be applied in the Sri Lankan context when it comes to general practices in the world.
- The study also addresses the importance of effective end-of-life management, particularly in developing countries like Sri Lanka.

4. Analysis

