



Hawai'i Natural Energy Institute Research Highlights

Energy Policy & Analysis

Disposal and Recycling of Clean Energy Products in Hawai'i

OBJECTIVE AND SIGNIFICANCE: The objective of this study is to conduct a comprehensive study to determine best practices for disposal, recycling, or secondary use of clean energy products in the State. In recent years, Hawai'i has seen significant growth in the use of solar photovoltaic (PV) panels. This is expected to continue with new systems, both rooftop and utility scale, combined with battery energy storage systems.

This situation will produce significant waste over the next 20-30 years. The objective of this work is to quantify this waste stream to identify potential hazardous materials, as well as those that may offer opportunity for cost-effective recycle. Hawai'i, faces the dual concern of possessing limited disposal options while hosting a significant amount of installed PV and storage materials.

BACKGROUND: The 2021 Hawai'i State Legislature, passed House Bill 1333, which requires that the Hawai'i Natural Energy Institute (HNEI), in consultation with the Hawai'i State Department of Health, conduct a comprehensive study to determine the best practices for disposal and recycling of discarded clean energy products in Hawai'i. Specific outcomes are to address: 1) the amount of PV and solar water heater panels in the State that will need to be disposed of or recycled, 2) other types of clean energy materials expected to be discarded in the State including glass, frames, wiring, inverters, and batteries, 3) the type and chemical composition of those clean energy materials, 4) best practices for collection, disposal, and recycling of those clean energy materials, 5) whether a fee should be charged for disposal or recycling of those clean energy materials, and 6) any other issues the Hawai'i State Energy Office and Department of Health consider appropriate.

PROJECT STATUS/RESULTS: This project commenced in September of 2021 and remains ongoing. Findings to date includes identifying material composition of PV panels, inverters, cabling, and mounting equipment as a function of installed power (kg/kW), cumulative installed PV by island for residential, commercial, and utility

scale since 2005 the project loading rate of aging PV materials as far out as 2045, preliminary estimates of installed battery capacity as residential, commercial, and utility scale, and estimates of material composition of PV battery as a function of installed power (kg/kW).

Preliminary results have been summarized in a separate report to the legislature.

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