MATERIAL FLOWS AND RECYCLING CASE STUDY

An Assessment of Clean Scrap Waste

OVERVIEW

Gypsum wallboard (AKA drywall) is an essential component of residential and non-residential construction projects offering fire protection, sound control, and design flexibility. As an easy, cut-to-size product, Gypsum panels are versatile, but create waste challenges. An estimated 10-15% of panels become waste, or clean scrap, when installed around doors, windows, and more. Addressing the challenge, The Gypsum Association contacted BWE to conduct a study identifying the environmental impacts of recycling and landfilling the clean scrap waste.

APPROACH

Concerns about growing volumes of construction and demolition waste, challenges in maintaining landfill capacity to meet these volumes, and a growing interest in green building have led industries, governments, and NGOs to focus on increasing recycling of construction-related wastes.

It became clear to the Gypsum Association that while aspects of what was at stake with gypsum waste were known or estimated, little else was known about the origin, disposition, and volume of flows of gypsum wallboard and resulting clean scrap.

The Association engaged BWE to conduct a material flow analysis of gypsum wallboard panels, identifying all flows entering California commerce via in-state production, transport from production sites in other states, and imports from foreign producers in 2019 and flows of clean scrap waste generation and disposition.

A key aspect of BWE's study was to determine the geographic origin of the clean scrap flows across the state which would, in turn, be a key aspect for determining the environmental impacts associated with recycling and landfilling of the waste.

BWE developed a novel approach to identifying gypsum panel use and related clean scrap generation at the county level. Using a proprietary data base with county level building permit data, we estimated the square footage of gypsum panel use and generation of clean scrap. Working with Chad Dorgan, PhD, PE, we developed a clearer picture of where clean scrap is generated and the potential for recycling what would otherwise be sent to a landfill.

Our key findings included that 60% of clean scrap is generated in Southern California and that recycling for agricultural uses was a feasible alternative for large volumes of scrap. A limited volume of scrap was potentially recyclable in the production of new wallboard.

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DELIVERABLES

The data that we collected fed into the second part of our project, which was to identify the environmental impacts associated with disposition of the clean scrap waste.

BWE did a modified version of a materiality study, which identified transportation as the key variable in assessing the relative benefits of recycling vs landfilling on carbon emissions. We engaged Carmen Henrikson of Circle Box Ventures to help us do a modified techno-economic analysis of recycling opportunities while BWE calculated the potential GHG emissions for the key factor in waste disposition.

Using the 2019 county level data, we identified a large differential in transportation-related carbon emissions when clean scrap is mechanically recycled (or landfilled) relatively close to the point of clean scrap generation versus the emissions that result when recycling requires significantly longer transportation distances.

CLIENT SUCCESS

The report generated for Gypsum Association provided information that informs agencies, legislators, and NGOs about the potential for recycling clean scrap regionally to minimize carbon emissions and for significant carbon emissions from recycling clean scrap that is transported from one region of the state to another region.

This, in turn, may influence policies regarding manufacturer responsibility for clean scrap given that all but one of the gypsum panel manufacturers in California are in the Bay Area in Central California and that majority of the clean scrap originates in Southern California.

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