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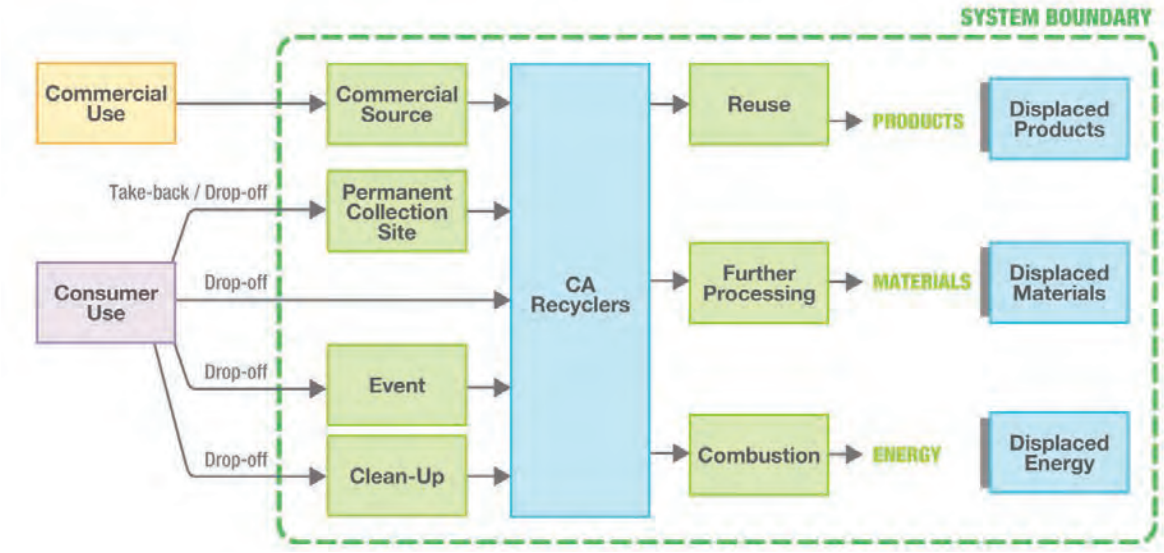
MRC'S CALIFORNIA MATTRESS RECYCLING PROGRAM PROVIDES IMPORTANT ENVIRONMENTAL BENEFITS

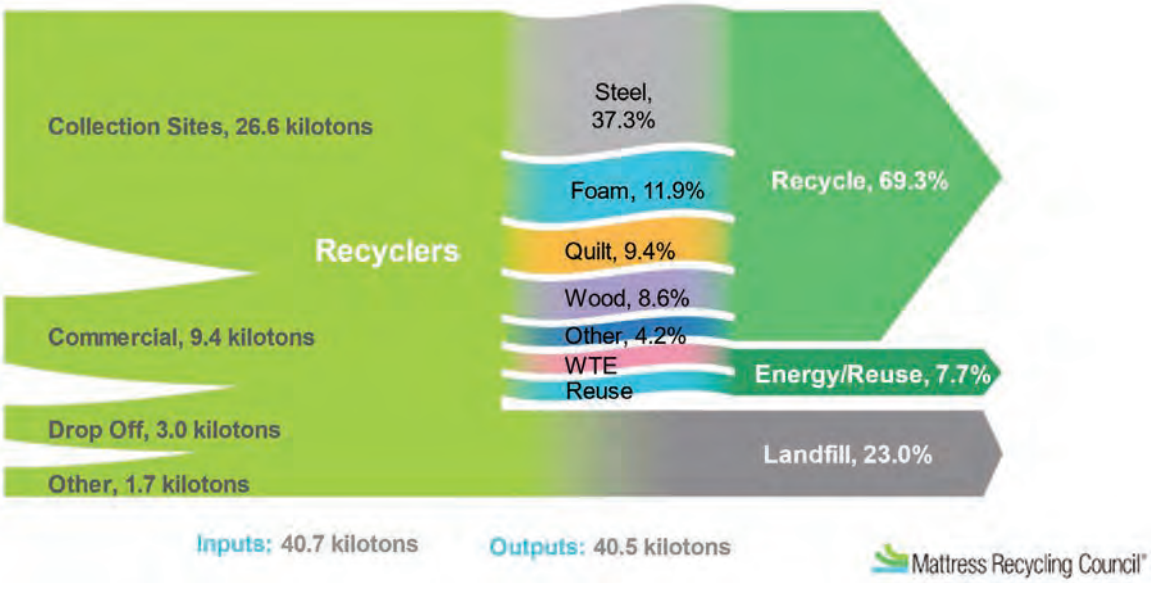
The U.S. mattress industry created the Mattress Recycling Council (MRC) to operate statewide mattress recycling programs in California, Connecticut and Rhode Island. MRC expects to expand its activities to Oregon in 2024.

Since its operations launched in 2015, these programs have recycled more than 12 million mattresses and diverted over 200,000 metric tonnes of valuable commodities away from landfills and incinerators and to companies that use these materials to make new products (or in the case of box spring wood, use the material to generate power).

To better understand the environmental impacts (both the benefits and the costs) of our recycling activity, MRC in 2020 hired Scope 3 Consulting, a Santa Barbara, CA based firm, to conduct a Life Cycle Analysis (LCA) of our California program. Completed in late 2022, the LCA results document the environmental benefits that mattress recycling today provides.

Scope 3 used a so-called "gate-to-gate analysis" to set the boundaries illustrated in the figure for evaluating the impacts of mattress recycling:





MRC aggregates discarded mattresses through a variety of collection channels, including existing solid waste collection networks, retailers who pick-up discards when they deliver new mattresses to customers, drop-offs by residents and businesses at public collection sites, collection events and direct pick-ups from large-volume sources like hotels and universities. To measure the environmental costs of mattress recycling, the LCA began at the point at which MRC collects discarded mattress units through each of these channels, and ended when the post-consumer materials removed from disassembled mattresses are transferred to companies or entities who will use the reclaimed materials for a new purpose.

Between these end points, Scope 3 conducted an input/output analysis, quantifying the environmental impacts of transporting over 15,000 loads of mattresses from collection points throughout California to one of nine recycling/deconstruction facilities.

The LCA also measured how each of those facilities used labor, equipment, energy, water and supplies to deconstruct the 1.6 million mattresses and box springs that they dismantled in 2021 and prepare the reclaimed materials for recycling or reuse.

Scope 3 next weighed (A) the resources that our recyclers consume (and their related impacts, e.g., greenhouse gases, smog, etc.) to generate the post-consumer steel, foam, and other mattress materials that they recycle against (B) the resources (and related impacts) that would have been necessary to make the same materials from virgin inputs. If A is less than B, then recycling provides net environmental benefits.

To illustrate this point, the primary materials that MRC's recycler's extract from mattresses are steel and foam. MRC's recovery and recycling of those two components drives most of the environmental benefit for the program by displacing the production of virgin foam and steel products.

To quantify the net environmental costs and benefits of mattress recycling, the LCA considered a broad range of environmental indicators including greenhouse gases, energy demand, water use, particulate matter and smog emissions. When completed, the LCA found that by recycling 1.6 million mattresses per year, MRC's California program generated the following environmental benefits:

- 75 million fewer pounds of greenhouse gases emitted, equivalent to the emission savings from driving a gas-fueled vehicle nearly 100 million fewer miles.
- 818 million gallons of water saved, equivalent to the annual consumption by a city of 37,500 residents in one year.
- 174,000 kilowatt hours of power saved, equivalent to the amount of power a city of 40,000 residents would use in one year.

Stated differently, the materials reclaimed from every mattress recycled save 500 gallons of water, enough energy to power the average household for three days and reduces greenhouse gas emissions by an amount equivalent to driving 60 fewer miles.

MRC's recyclers currently use mechanical processing methods to reclaim the post-consumer mattress material for reuse and recycling. To illustrate how the environmental benefits of this approach compare to other methods for disposing of discarded mattresses, the LCA also quantified the environmental impacts of several alternatives, including landfilling, incineration, chemical recycling, pyrolysis and gasification.

These calculations are based on the life cycle analysis of MRC 2021 California operations. The full report is available: www.mattressrecyclingcouncil.org/research

In addition to demonstrating that MRC's California mattress recycling program generates impressive benefits across a broad spectrum of environmental indicators, the LCA is a tool that MRC and other recycling organizations can use to improve their performance.

Measured by weight, MRC's California recyclers today recycle 77 percent of the mattresses and box springs they receive. Furthermore, the LCA shows us that most of MRC's energy consumption and carbon emissions are associated with the collection and transport over 15,000 truckloads of discarded mattresses annually.

The LCA will help MRC prioritize capital investments and other actions needed to reduce both the 23 percent of each mattress that is landfilled today and our transport-related emissions.

The LCA will also help guide research and technology decisions, inform policy discussions and allow MRC to evaluate future scenarios more accurately.

MRC has made the full LCA (including the equations used to estimate the benefits) available to recyclers elsewhere as part of our ongoing efforts to learn from each other's experiences.

They can use these tools to measure the environmental costs and benefits of their specific recycling circumstances. MRC also welcomes feedback to help improve the accuracy and value of this LCA.

An independent panel is auditing the LCA that Scope 3 prepared to determine whether it meets relevant standards established by the International Organization for Standardization (ISO).

MRC will disclose the results of the ISO compliance audit once it is completed.

Readers may download the full 104-page LCA report, as well as a recording of a webinar with Scope 3 discussing the results of the LCA, at www.mattressrecyclingcouncil.org/lca-report.