Carpet recycling increases much needed landfill space

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According to the most recent annual report from CARE, the organization's members diverted more than more than 488 million pounds of carpet from U.S. landfills in 2016, down nearly 6 percent from 2015. Of the carpet diverted to recycling, 167 million pounds were recycled into carpet and other consumer products, 174 million pounds were sent back to the landfill, and 144 million pounds were sent to waste-to-energy and cement kilns.

As CARE's executive director, Dr. Robert Peoples, explained, "Data shows the carpet recycling industry is under mounting stress. Until oil returns to greater than $70 per barrel, we see conCARE is a voluntary, non-profit organization dedicated to increasing the landfill diversion, reuse and recycling of waste carpet, through market-based solutions that benefit the economy as well as the environment.

According to Peoples, "72 percent of recycled post-consumer carpet is manufactured into plastics. This category has grown over the past few years. The amount of material recycled in carpet fiber dropped 10 percentage points, from 13 percent to 3 percent. Carpet backing remained constant at 8 percent of end products manufactured and 11 percent of recycled post-consumer carpet pounds that were recycled went into new carpet. This is considered a true cradle-to-cradle process."

Challenges in Carpet Recycling

Carpet removed in construction and demolition projects cause a myriad of problems, including the cost and accessibility of carpet recycling programs. The difficulty of recycling carpeting is because a carpet is comprised of an assembly of parts – the face fiber and backing system – each of which plays a role in the performance of the carpet.

The face fibers are considered to be the most valuable part of the carpet for recycling. However, identifying and separating the type of face fibers is a tedious process, considering each face fiber has different properties, so they must be separated. What's more, the backing systems most often include latex and polyvinylchloride (PVC) backing systems, both of which require different procedures in properly recycling these carpet components.

Programs and Processes In Place

In recent months, California's carpet stewardship program has gained national attention. Here's why: California is the first state to establish a private-sector designed and managed statewide carpet stewardship program. This program follows producer responsibility principles to ensure that discarded carpets are recycled and become a resource for new products in a manner that is sustainably funded.

In October, California Governor Jerry Brown signed carpet recycling legislation that will help California reach its target of emitting 40 percent fewer greenhouse emissions by 2030. The bill, AB 1158, builds on and enhances the state's current carpet recycling program mandates that carpet stewards achieve a 24 percent recycling rate and discouraging the use of incineration.

In a statement, Assembly member Kansen Chu said, "I applaud Governor Jerry Brown for signing my bill into law. AB 1158 is the result of great collaboration between diverse stakeholders, including policy and environmental groups, labor, manufacturers, local government and recyclers. Keeping carpet out of landfills and incinerators benefits Californians and our environment. AB 1158 is a reasonable approach to improving the existing program and will protect consumers that are paying to fund carpet recycling."

"I thank Governor Brown for signing this important piece of legislation," said Heidi Sanborn, executive director of the National Stewardship Action Council, in a statement. "It's imperative that we increase the proper recycling of carpet as these materials are now one of the largest greenhouse emitters of any landfilled product. Nationally, approximately 4.7 billion pounds of carpet end up in landfills each year. Most of the materials are plastic made from oil and have a large GHG footprint. By signing AB 1158 into law, we are not only protecting consumers by ensuring the recycling fee is used for recycling, but will be protecting the environment while creating jobs."

Like California, South Carolina is also increasing their pressure of improving carpet recycling in the state. As such, the South Carolina Carpet Recovery Coalition, was established to increase the recovery of post-consumer carpet and carpet padding. A cooperative effort between the South Carolina Department of Commerce, the South Carolina Department of Health and Environmental Control, businesses, local governments, and universities, the organization's goal is to maximize the economic and environmental benefits of carpet recycling.

Carpet manufacturers are also taking a significant role in increasing the recyclability in carpeting.

"While it's common knowledge that diapers are a dilemma for U.S. landfills, most people don't know that a close second is old carpeting," said Bruce Petrovick, account manager at DSM North America. "More than four billion pounds of disposed carpeting ends up in landfills every year. That's about two percent of all municipal solid waste every year, according to EPA estimates."

According to DSM North America, the big problem is that traditional carpeting is extremely difficult to recycle because it is made of several different materials that must be taken apart before processing. The easiest way is to shave carpet fiber of the facing of the carpet – which is where most of the current small amount of recycling comes from – but the bulk of recycling carpet means separate layers of materials bound together by high-temperature cured latex, which is both time consuming and expensive.

"Environmental issues like landfill waste and water contamination are becoming real problems in the U.S. We have a corporate responsibility to work on solutions that will allow all of us to live safely without the fear of poisoning ourselves," Petrovick said. "So we started redesigning a product from the ground up to make it fully recyclable. We were surprised with some additional performance benefits, that later proved to be crucial to make it work in the market place."

DSM, along with tech start-up Niaga reimagined the way carpet is created, and developed a mono-material system in which the polyester carpet fibers are bound together with the polyester padding using a polyester adhesive. This way, the carpet can be recycled in full into new fibers for carpet, using well-known polyester recycling technologies.

Niaga is talking with other carpet makers to license its technology. That's important because the philosophy of the partnership between DSM and Niaga is rooted in both company's sustainability missions. DSM corporate efforts include work on renewable energy, lowering greenhouse gas emissions, increasing energy efficiency and tying executive compensation to sustainability targets. Meanwhile, Niaga was conceived around the idea of redesigning and reengineering everyday products to reduce waste.

"Our strategy is to make sure the technology is available to everyone in the carpet industry," said Lukas Hoex, marketing manager at DSM-Niaga. "We want this to have a big impact on the industry because we believe recyclable carpet has huge benefits for the

consumer, retailer, recyclers, and the environment, as well as municipalities and governments dealing with waste issues."

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