



ROLLING OUT THE GREEN CARPET

A new carpet recycling strategy breaks down the basics to successful carpet recycling, and outlines the necessary steps to capitalizing on this abundant waste stream.

BY SHIRLI AXELROD, KRIS BEATTY AND JAMES PALMER

Most of the 50,000 tons of used and scrap carpet generated annually in Seattle, and throughout the greater King County area, is unfortunately landfilled. Luckily, that is about to change, as carpet sellers and installers, local processors and national end-users, as well as manufacturers of products that can use recovered carpet fiber, all have come together in support of a new strategy to divert all that scrap carpet from landfill, and boost the recycling of this abundant materials stream.

Known as the Northwest Carpet Recycling Workgroup, the strategy is being led by Seattle Public Utilities (SPU) and King County's LinkUp program, whose goal is to expand markets for selected recyclable and reusable materials by facilitating an interactive community of businesses, public agencies and other organizations. The benefits of this new and growing public-private collaboration include removing materials from the waste stream, supporting existing and new local end-markets for recycled carpet fiber, creating jobs and reducing greenhouse gas (GHG) emissions.

A 2008 report prepared by Olympia, Washington consulting firm Sound Resource Management Group for SPU – entitled *Environmental Impacts From Carpet Discards Management Methods* – found that recycling was, by far, the preferred end-of-life choice for carpet, in terms of reducing GHG emissions. The study analyzed emissions from the full lifecycle of carpet. Findings showed that recycling one ton of used carpet into new carpet reduces GHG emissions by between 8,300-8,600 pounds of carbon dioxide equivalents (CO₂E), as compared to making new carpet from virgin materials.

Handling the material

Designed to withstand years of use, carpet is difficult to dismantle, as it's woven from many different types of materials. Most carpets contain one type of material in the face fiber and one or more different materials in the backing. The majority is made of petroleum-based nylon, a long-lived thermoplastic. The pile or face fiber is woven and/or glued to one or more backings comprised of other plastic resins or latex. Once the face fiber has been re-processed – roughly one-third of the weight of used carpet is in the face fiber – the material can be used to manufacture new carpet or a range of other fiber and

molded plastic products. Approximately 75 percent of new carpet sold is made of Nylon 6 and Nylon 6-6, with smaller percentages made of polyethylene and natural fibers, such as wool.

The first step in the chain of events for recycling carpet involves removing used carpet. And, it is important to assure that the removed carpet is free of unwanted debris and kept dry on its way to being processed.

“Our customers want green building credits for recycling, and we are committed to keeping usable materials out of the landfills,” says Chuck Young, President and CEO of Division 9 Flooring. “We’ve been able to increase the amount of carpet recycled by meeting with our installers regularly, so that our materials meet the acceptance specifications of the recyclers. This is standard practice in almost all of our jobs.”

After removal, used carpet can go to a local pre-processing firm or directly to manufacturer-supported recycling facilities, most of which are located in Georgia. U.S. carpet mills are largely headquartered in the Southeast and, due to proximity issues, processing plants are developed there, too, in order to handle mill wastes. Chart 1 breaks down carpet collection, by region, for the 2009 calendar year.

“Figuring out how to process carpet for recycling here in the Northwest makes great sense economically and environmentally,” says Dick Lilly, waste prevention manager for SPU. “It will save companies the cost of shipping to other parts of the country and cut the greenhouse gases generated by trucking.”

The next step is to sort by fiber, aided by a handheld analyzer that identifies the fiber’s plastic resin type. The various fiber types must be handled differently in order to be usable, so correct fiber type identification is critical.

Several methods have been developed for breaking carpet apart. Face fiber is detached by various chemical or mechanical means, and then usually cleaned, “opened” (un-spun) and, particularly for nylon 6, de-polymerized. The backing can also be broken down into its component parts and used in the manufacture of recycled content products, as well as in new carpet.

At Recovery 1 in Tacoma, Washington, General Manager Terry Gillis experimented with dismantling carpet and developing new end-products, while also providing sorted bales to other processors and manufacturers.

“It’s far more efficient to extract and ship the component parts desired by the

About CARE

Representatives from carpet mills, flooring sellers, recycling firms, government agencies and non-government organizations have begun meeting monthly to develop a national agreement on carpet recycling. In April, the national Carpet America Recovery Effort (CARE) convened for the first time to discuss negotiations for a carpet recycling system, following on an earlier agreement from 2002. The earlier Memorandum of Understanding was signed by a number of states, as well as by most carpet manufacturers and several other stakeholders.

The current negotiations center around a sustainable funding mechanism supported by the Carpet and Rug Institute, generally expected to take the form of fees paid by manufacturers per square yard of carpet sold. A new agreement is sought by October of 2011, to take effect in January of 2012. More information is available online at www.carpetrecovery.org.

various end-users rather than sending whole carpet,” says Gillis. “We are working with local, regional, national and international partners to develop sustainable end-markets for the materials we can extract from waste carpet.”

Markets and end-uses

Recovered nylon is used in new carpet and a range of other products, from plastic sunglasses to oil-spill absorbent mats. Since potential end-markets exist all around the country, it’s not necessarily desirable to concentrate processing facilities in the Southeast. Companies with and without connections to carpet mills have pioneered

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technologies and machinery to re-process carpet.

According to Ron Greitzer, of processing company Los Angeles Fiber, “The key to making the whole system work is creating demand for the products made with the recycled materials. As that demand grows, we foresee building several plants around the country that take advantage of the fact that the machinery and the processing are now scalable. Neither the used material generators nor our end-markets are all in

one part of the country, so our industry will become more efficient if we reduce shipping distances on one or both ends.”

Local business opportunities are apparent to economic development agencies as well.

“Recycling means business, and the Northwest has considerable infrastructure and expertise in components of the recycling supply chain,” says Susan St. Germain, senior economic development manager with the Washington State Department of Commerce. “The strength of the green building industry in the Northwest, plus incentives for recycling businesses, makes this region favorable.”

Other parts of the country may not realize the scope of industries in the Northwest that contribute to the recycling supply chain, such as generators of carpet scrap, innovators of recycling technology and end-users of products made from recycled material. For example, the hospitality industry serves as a large source for generating good used carpet to recycle, while local university programs conduct research and testing to support businesses interested in recycling processes and making products with recycled content.

According to St. Germain, “The aerospace suppliers in our area are potentially a substantial end-market for these products. By turning carpet fiber into plastic parts, stuffing for airline seats, or hundreds of other uses, we can help local businesses cut costs, lower their carbon footprint and do good for the Puget Sound environment by eliminating carpet from our landfills.”

Recognizing the local business potential was an early driver for SPU and King County, after hearing from carpet sellers and property owners unable to recycle carpet

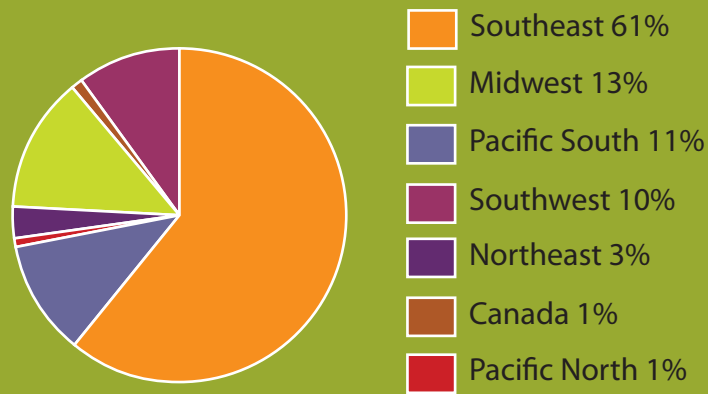
economically. Input from meetings with local businesses led to a regional strategy, with the dual objectives of developing local carpet processing capacity and end-markets for products using recovered carpet.

Jeff Gaisford, manager of the Recycling and Environmental Services section of King County's Solid Waste Division states, "Because of the large volume of carpet being landfilled, we knew a recycling strategy made sense. We also knew that shipping carpet across the country was not a sustainable solution. King County and Seattle charge over \$100 per ton for wastes bound for landfill. When it comes to recycling, we can do a lot here that may not work in other parts of the country."

The Pacific Northwest enjoys a convergence of opportunity, right now, to stop landfilling this valuable resource. With the public and private sectors working together to develop local processing capacity and end-markets, the region is on-path to divert much of the 50,000 tons of used carpet currently going to regional landfills each year, all while creating jobs and reducing impacts on climate change. **PRU**

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Chart 1 | 2009 carpet collection, by region



Source: Carpet America

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