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RESOURCE RECYCLING

PUTTING AN OLD PROBLEM TO BED

BY SOPHIA BENNETT

Any landfill operator will tell you that mattresses and box springs are a headache to handle. They're bulky, don't compact well and create flammable air pockets. Broken mattress springs can damage processing equipment such as compactors or bulldozers, creating dangerous conditions for workers.

Keeping beds out of the waste stream is the preferred option, but there are only so many that can be donated to thrift shops or other reuse organizations. Plus the recent bedbug epidemic has made people think twice before accepting an old mattress.

That's the bad news. The good news is that creative entrepreneurs around the world are finding cost-effective ways to recycle mattresses and 80-to-90-percent of the contents of a mattress are recyclable if they can be separated.

The St. Vincent de Paul Society of Lane County (SVDP) in Eugene, Oregon was the first company to establish a commercially-viable mattress recycling business and continues to operate the largest program in the U.S. To date, they've recycled over 1 million mattresses and box springs and the business has been

Often a forgotten aspect of the recycling industry, mattress recovery can nonetheless be an important part of any solid waste diversion program. One nonprofit organization in the Pacific Northwest takes this sleeping black sheep of the recycling world, wakes it up and makes it new again.

so successful that SVDP is working with other nonprofit groups to establish similar programs in their communities.

The early days of mattress recycling

SVDP is part of the international Society of St. Vincent de Paul, a charitable organization founded in Paris in 1833. Today, the Society can be found in nearly every country in the world.

By 1999 SVDP had already had some luck setting up recycling-based businesses as a way to create jobs, raise funds to support its social service programs and practice good environmental stewardship. But Terry McDonald, SVDP's Executive Director, wanted to do more. He started exploring the feasibility of recycling mattresses. "We tend to look at things that no one else is doing and that are challenging for solid waste districts," he says. "Mattresses certainly fit the bill."

StopWaste.org, a waste reduction and management agency serving Alameda County, California,

was the first agency to express interest in the idea. With the help of a small feasibility study grant, McDonald set out to learn all he could about old mattresses.

The Better Sleep Council reports that a mattress should be replaced every five to seven years. If every American household replaces one bed every seven years, that means approximately 15 million mattresses are landfilled annually. If each household also replaces the matching box spring, that doubles the total to 30 million. And that doesn't take into account the beds that come out of hotels, retreat centers, universities and other lodging facilities. SVDP estimates that about 10 percent of mattresses can be reused, leaving 90 percent that need to be recycled, either because of wear, broken springs or frames, or stains or tears in the fabric. At an average of 23 cubic feet per mattress (or box spring), those non-reusable beds, if thrown away, would take up 620 million cubic feet of landfill space.

By the time the feasibility study was complete, McDonald was convinced mattress recycling could work. He forged ahead with the business under the name DR3 (Divert, Reduce, Reuse, Recycle) Mattress Recycling.

The original plan was to run mattresses through a two-shaft vertical shredder, which proved to be disastrous. The springs wrapped themselves around the shafts, meaning the machine was often shut down for repairs. The cost of resurfacing the shredder blades exceeded the value of the recycled steel. Although the steel could be separated from the soft material with a magnet, there was no way to separate the valuable foam from the waste cotton. One year into the business, McDonald abandoned the shredder in search of new ideas.

Mattress recycling today

The best solution turned out to be the simplest – DR3's workers manually split open each mattress. The different commodities are removed by hand and organized for recycling. The metal is returned to the steel processors. The wood is sent to a chipper for use as a fuel. The foam goes into carpet padding. The cotton has been the hardest material to market, but McDonald has been able to sell some for use in insulation. He would like to see the fibrous mats that are sometimes wrapped around the metal springs used for erosion control or weed barriers.

Besides stripping mattresses, workers unload trucks, drive the forklift and bale materials. Many of SVDP's workers come from disadvantaged backgrounds and appreciate the opportunity to learn a wide variety of transferable skills.

SVDP now runs two mattress recycling operations – the DR3 plant in Oakland, California and a facility at its home base in Eugene, Oregon. Mattresses come from as far away as Los Angeles and Seattle. Between the two facilities the agency processes an average of 150,000 pieces per year.

Bringing mattress recycling to other communities

Although DR3 was the first commercially-viable mattress recycling operation, others have since sprung up across the U.S. in recent years. Mattress recycling businesses now exist in over 13 states including, Florida, Massachusetts, Minnesota, Ohio and Washington. Mattress recycling facilities can also be found in Australia, Canada, England, France and Scotland.

Mattress recycling makes sense for nonprofits looking to diversify their income streams. The return-on-investment in mattress recycling probably doesn't meet the standards of a typical business. For a charitable organization, however, the project can fulfill enough aspects of its mission that it's worth the modest monetary return. In 2010, the Robert Wood Johnson Foundation gave SVDP a grant to share its mattress recycling wisdom with nonprofit groups around the country.

The Mustard Seed of Central Florida is one of the partners in the grant. The Orlando-based organization's principal mission is to accept donated furniture for resale to low-income families and people who have lost their belongings in hurricanes or other natural disasters. The Mustard Seed was struggling to make ends meet and wanted to explore some kind of earned-income venture.

Mattress recycling was just the ticket. "We've been able to help more families through the revenues we've earned from mattress recycling," said Michelle Lyles, Executive Director. "We're training individuals who need job skills and helping the planet. It's also gotten us into other forms of recycling. We eventually hope to become *the* recycling center in Orlando."

Local solid waste districts looking to

up their recycling rates and increase the life of local landfills will also see multiple benefits from mattress recycling. Mattresses and box springs are easily identifiable products that can be separated by landfill or transfer stations workers. As noted previously, removing mattresses from landfills can cut down on equipment damage and worker accidents as well as save valuable space.

Lane County, Oregon's Waste Management Division conducted a study on landfilling mattresses in 1999 and 2000. The agency determined that "garbage without mattresses can be compacted to a size four times smaller than compacting only mattresses." Furthermore, the agency noted that if the loss of landfill space, equipment damage and worker injury were all taken into account, the cost to dispose of mattresses was nearly 70-percent more than the cost of landfilling other types of waste.

Don't let the bedbugs bite

One of the biggest challenges facing mattress recyclers today is bedbugs. The invasive little critters have struck fear into the hearts of everyone dealing with second-hand mattresses. It is possible to fumigate mattresses for bedbugs, but there is concern that sprays will not destroy all the eggs. Also, some workers may not be comfortable working around harsh chemicals.

Heat treatment seems to be the most viable solution. A 2009 article in the *Journal of Economic Entomology* reports that exposure to temperatures between 105 and 120 degrees Fahrenheit (41 to 49 degrees Celsius) over an extended period of time will kill bedbugs.

The best thing, of course, is to prevent a bedbug outbreak from reaching your facility in the first place. Handlers will have to make a decision about whether to treat mattresses than may have bedbugs or simply throw them away.

Charley Harvey, SVDP Assistant Executive Director, actually sees bedbugs as an opportunity. "We expect homeowners and hotels will change out their mattresses more frequently," he said. "That means more mattresses for us."

Keys to mattress recycling success

McDonald shares the following pieces of advice with communities interested in setting up mattress recycling programs:

- The first thing to identify is whether there is an adequate supply of mattresses. Landfills or transfer stations; retailers with mattress take-back programs; hotels; universities and other institutions are possible sources. Having a clear plan for cost-effectively gathering those mattresses is crucial.
- The value of materials removed from mattresses will not cover the cost of recycling them. Therefore, it is necessary to charge a recycling fee. Potential businesses should investigate whether potential mattress suppliers are willing to pay a recycling fee. Some solid waste districts may already be charging a per-piece fee for mat-

tresses. In other places, tipping fees may be so low that mattress recycling fees will be a hard sell.

- Tearing apart mattresses is very dirty and very physical. Nonprofit groups thinking about mattress recycling as a job training activity should consider whether this type of work is appropriate for their population.

Even with concern about bedbugs and other unsavories, mattress recycling is worth exploring. Tom Padia with Stop-Waste.org, one of DR3's original partners, still sees multiple benefits from the program. "It solves an end-of-life problem for landfill operators... and creates local,

green jobs in the process," he said. "The fact that DR3 is able to generate revenues to help provide social safety-net services to people in need is another plus. DR3 is an all-around win." **RR**

Sophia Bennett is the special projects manager for St. Vincent de Paul Society of Lane County. She can be contacted at (541) 687-5820 or sbennett@svidp.us.

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