

# Collection of mattresses from households for component re-use and recycling

CAD Recycling is a waste management and recycling company based in Denbigh, North Wales. They collect mattresses at Denbighshire's HWRCs and break them down into their component parts for re-use and recycling.



## **Collection of mattresses for re-use and recycling: Denbigh, Wales**

This is an example of the collection of post-consumer mattresses from households. Bulky waste collections are undertaken by Denbighshire County Council and mattresses (and carpets) are brought by residents into Denbighshire's three HWRCs run by CAD Recycling.

## Key facts

Organisation: CAD Recycling Ltd

Type of business: Private waste management contractor

Location: Denbigh, Denbighshire, Wales

Type of non-textile: Post-consumer mattresses from domestic sources and carpets.

Type of collection: Collection at HWRCs, council bulky waste collection

Tonnes collected per year: Around 11 tonnes of mattresses collected in the first month since opening in December 2012, predicted output is 450 tonnes per annum. Around 190 tonnes of carpet are collected each year.

Re-use/recycling rate (2012): Mattress recycling rate 98%, sites also accept carpets with a recycling rate 98%.

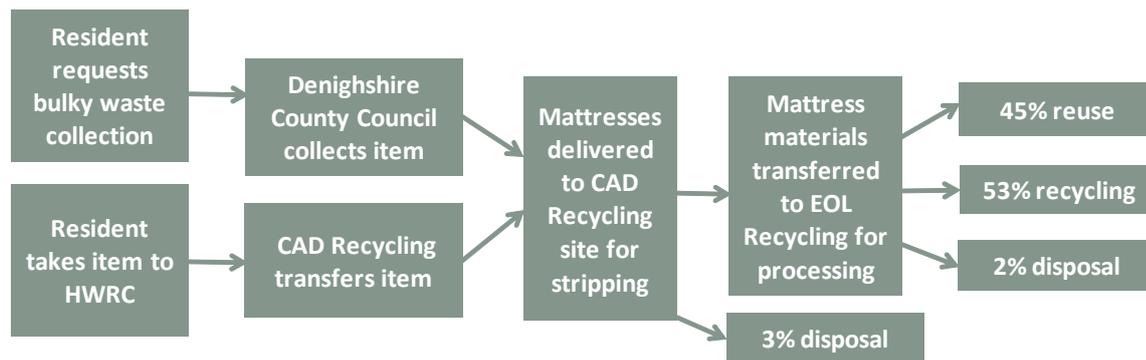
Number of employees: 2 full time working on mattress stripping.

### Introduction and background

In April 2009 staff at Rhyl Recycling Park site started separating bulky items that were unsuitable for re-use and stripping them down by hand into their various components for recycling. The idea came about when site staff were asked how they could increase the recycling rate. The arrangement between the contractor, CAD Recycling and Denbighshire Council is designed to incentivise innovative approaches to increasing recycling rates, and bonus payments are provided for additional material diverted from landfill. Following the success of the deconstruction initiative, CAD Recycling, in conjunction with recycling firm EOL Recycling, created a dedicated facility for mattress recycling at their site in Denbigh which opened in December 2012. This site now processes all the mattresses brought in to Rhyl Recycling Park, Ruthin Recycling Park and Denbigh Civic Amenity Site, as well as some from neighbouring Colwyn Bay.

### Description of the operation

Mattresses are either delivered to one of Denbighshire's three HWRCs directly by residents in their own vehicles which make up 95% of the mattresses processed, or co-collected with other bulky items by the local authority using a 3.5 tonne Luton bulky waste collection vehicle. The bulky waste collection service costs residents £5 per item collected. At the HWRC sites mattresses are stored in 40 yard skips in Ruthin and Denbigh and under a carport structure in Rhyl to protect them from the weather. Mattresses are collected from these sites every second day and brought to the new facility in Denbigh for processing. Mattresses from Colwyn Bay are delivered by a second waste contractor twice a week.



The mattress deconstruction operation takes place in a large warehouse at the CAD Denbigh site. CAD Recycling was able to use existing warehouse space and equipment for its operation. Each mattress is placed on a table with a height adjustable swivelling base, allowing staff members to easily cut all the way around the mattress. The tick (cover) is removed first, then the flock or padding. Materials are sorted and placed in one of the three balers in the room. Once there is sufficient material it is baled and taken away by a small forklift for storage in the holding area in another warehouse. The springs are inspected and sent for re-use (where suitable) or recycled as scrap otherwise. All sorted and baled materials are then sent on to EOL Recycling in Preston for reprocessing using an articulated lorry.

All materials are sanitised using a disinfectant spray by EOL recycling before resale. These materials are then used in the production of low cost refurbished and recycled mattresses and other uses. For example:

- textile components are reprocessed into a variety of products including geotextiles, automotive insulation and new mattress textiles
- springs are tested to ensure their integrity, fixed where necessary and re-used in new mattresses, or sold for recycling if not re-usable.

With outlets for over 40 different types of materials, EOL Recycling achieves a recycling rate of 96-98% for each mattress. EOL's new facility in Nottingham also recycles soft furnishings, cushions, duvets and pillows as well as mattresses.

Carpets are also segregated at the HWRCs. Between 14 and 18 tonnes of carpets are collected each month within Denbighshire. These are then bulked up by CAD recycling and sent on for reprocessing to recycler Eco2 in Burnley. The carpets are then recycled into surfaces to be used in equestrian arenas.

### **Performance/outcomes**

- Number of collections/deliveries: Around 1,350 mattress collections from HWRCs by CAD Recycling each year and around 100 mattress deliveries by Crest each year.
- Non clothing textiles collected: Predicted to be ~450 tonnes of mattresses and ~190 tonnes of carpets per annum.
- Recycling rate: Mattress recycling rate 98%, carpet recycling rate 98%.

**Figure 1** Mattresses being taken apart in Denbigh



### **Innovation/good practice**

By deconstructing mattresses, sanitising and re-using or recycling all the different materials EOL Recycling's process makes good use of all components. Materials can be reconstructed into new refurbished mattresses, creating a closed loop recycling system. This process allows for the large scale re-use of components such as springs in a financially viable way that is acceptable to the public.

## **Description of costs and revenues**

This box provides a summary of the main annual costs and revenues (detail given where provided).

### **Costs:**

Licensing/set up costs: None as using existing facilities.

Collection vehicles: Two 3.5 tonne vehicles (operating within approximate 25 mile radius of site) estimated cost of each vehicle £25,000.

Buildings: Existing warehouse space for stripping and holding materials (around 350 m<sup>2</sup>).

Equipment: Three 40 yard skips (~£9,000) and three vertical balers (second hand, (~£18,000).

Dedicated staff: Two FTE working on mattress stripping.

Transfer costs: Around £30/tonne to Burnley or Preston using articulated lorries

### **Revenues:**

Gate fees paid to CAD Recycling for mattresses from outside council area (£4.50 to £5.50 per mattress)

Sale of materials for re-use or recycling

Landfill tax and gate fee savings

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**Figure 2** Bales of materials in the holding area after deconstruction.



### **Conclusions/key learning points**

This case study demonstrates that diverting mattresses from landfill does not necessarily require large amounts of investment. In this case a good relationship with employees, a strong commitment to recycling and finding the right partnership has allowed CAD Recycling to operate an effective service for Denbighshire County Council.

CAD Recycling's new mattress operation recycled around 600 mattresses in its first month of operation, diverting nearly 5 tonnes of steel springs to re-use and over 5 tonnes of textiles to recycling. They plan to start accepting mattresses from other surrounding counties and with the addition of a new staff member they expect to be processing over 500 mattresses per week by the end of 2013. They are also planning to start processing other bulky waste items such as soft furnishings to remove textile and wood components for recycling in the near future.

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