

# Adding value through recovery

A British company has developed an innovative mechanical recycling system, which – rather than shredding – preserves the marketability of household waste

**W**ith the pressing need for local authorities to decide how to deliver waste strategies, and higher diversion targets and landfill allowance trading scheme (LATS) penalties looming, it is often difficult for decision-makers to evaluate new waste technologies. Many solutions exist only theoretically or may be too small-scale for practical data to be produced on their everyday use and effectiveness.

Travelling abroad may not answer questions because the composition of household waste, which differs by region in the UK, varies even more widely across countries. Across nations, the variation of targets and standards for the output from waste processes adds to the problems of evaluating it for domestic application.

Wastec is a British company, which, over the past eight years, has developed a mechanical recycling system to separate, recover and recycle much of what the

average household throws away. Driven by the National Waste Strategy and the EU Landfill Directive, Wastec's technology enables LAs to more than fulfil these obligations and facilitate higher diversion rates when used as part of a wider strategy.

**“The system maintains the characteristics of the different elements of household waste to preserve its marketability”**

Initially developed in Stockton-on-Tees, the first commercial operational site was established on a Yorwaste operated landfill site at Seamer Carr, Scarborough, at the end of 2004.

## Recovery is key to the process

Unlike other mechanical separation systems, which initially shred the waste, the Wastec system maintains the characteristics of the different elements of household waste to separate it effectively and preserve its marketability. The key is recovery.

Housing the Wastec system in a building on the Seamer Carr landfill site also means that household waste is delivered directly from the collection vehicles to the plant. The Scarborough facility currently operates on a five-day week, with a daily eight-hour shift employing a twin-stream system. With this system, and on a single shift, there is the capacity to process 25,000 tonnes per annum and, as the system is modular, it can easily be scaled up to deal with much larger waste streams.

Refuse entering the Wastec system initially passes through a patented bag splitter, which liberates materials and automatically removes any oversized **320**



Renewable fuel pellets – in this case, paper

materials. Gordon Morehead, the brains behind the Wastec system, says that in his operational experience he has seen whole engine blocks, bicycles and mattresses featuring in the waste stream.

The liberated waste then enters the heart of the unit, the Kinetic Streamer, which gives the system much of its flexibility and adaptability. It is a hydraulic system that splits the waste into two streams. The first is predominantly the flimsy materials, the organic fraction, paper, plastic film, and textiles. And the second is the steel cans, aluminium cans, glass and plastic bottles.

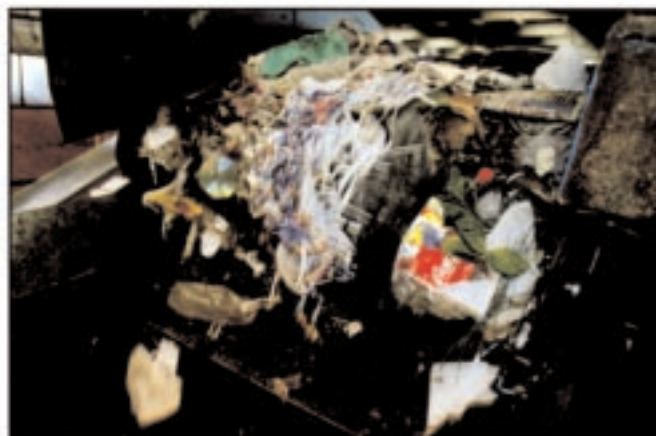
These recyclables are then further divided into the marketable outputs via a series of mechanical processes and a hand-picking line to separate the paper and colour separate the glass. The system can recover 90% of the steel, aluminium, rigid plastics and organics from the waste and a generally smaller amount of glass and paper.

### Renewable fuel benefits

At Scarborough, the paper is further treated to produce a renewable fuel, it is shredded and formed into briquettes which are sold to Slough Heat & Power and receive the renewables obligation certificate. The organic fraction is composted in a vessel accelerated composting system on-site, provided and operated by a New Zealand company, HotRot Composting Systems. This system can be monitored and controlled in compliance with the Animal By-Product Regulations.

Steve Grieve, managing director of Yorwaste, says: "Working with our partners Wastec and HotRot Composting Systems, we have installed two recycling facilities which will play a major part in helping to meet Government targets for the recycling and recovery of waste."

The effectiveness of the mechanical separation also offers opportunities for downstream reprocessing. After the recovery, the residual materials make an ideal feedstock for composting, anaerobic digestion, energy from waste or advanced thermal treatments such as gasification or pyrolysis.



Wastec's patented bag splitter

With the low processing cost for the mechanical separation – the system is modular so the actual cost per tonne varies – it remains economically viable as a pre-sort for subsequent treatments. Knowing the composition of waste going on to these processes will increase their effectiveness as well as reducing the environmental impact of destroying materials that can be properly recycled. After the materials go through the process at Seamer Carr, around 35% of the waste has been recovered. But after the installation of additional downstream equipment, diversion rates in excess of 80% could be achieved.

As all of the waste collected in the traditional weekly collection can pass through the system, there is a 100% participation level from householders – which, as Gordon Morehead explains, means that "every household bin becomes a recycling bin".

### Capturing co-mingled materials

Yet, established kerbside recycling schemes do not make the system any less effective. The system will capture materials that have not been source separated for recycling and recently the company has completed a trial on co-mingled recyclables collected via a kerbside scheme, which claims to have achieved excellent results at a far lower cost than the usually labour-intensive clean MRF systems.

The machinery is housed in a low-profile building, potentially avoiding planning difficulties for sites within a reasonable proximity of the communities that need them, and reducing the environmental impact of moving waste great distances for processing. Wastec is currently working with partners to provide fully integrated waste management solutions for a number of applications.



Trommel extracting organic fines

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