



Garbage miners mean business

The intractable garbage that doesn't go into kerbside recycling bins – officially known as 'residual waste' – is at the heart of the waste disposal crisis, as it mounts up at landfill sites. Now, an Australian resource company has applied its skills in mining and process engineering to come up with a remarkable combination of tried-and-tested technologies from around the world to recover, with just one large facility, an extra 23 000 tonnes of valuable recyclable material a year from residual waste.

Among other benefits, the process diverts about 70% of garbage that would otherwise go to landfill. It does this by separating out valuable 'resources' including metal, plastic, paper and glass and converting the organic component into compost and fertiliser products.

The company is Global Renewables, a subsidiary of GRD Limited, and its facility at Eastern Creek in Sydney – known as the UR-3R Facility (short for Urban Resource – Reduction, Recovery and Recycling) – has operated as a public-private partnership since late 2004. Global Renewables has invested \$150 million in its development and construction, and the plan is to expand around the world. The company management sees it not only as a shrewd investment, but also as a quantum leap in sustainability practice.

'We see waste as a recoverable resource – the world's largest renewable ore body,'

says Managing Director Dr John White. 'We mine waste, if you like, and the design philosophy of the UR-3R Process® is to recover the highest net value possible from all components of the waste stream, even the difficult organics. We conserve as much of the embodied energy as possible and minimise or avoid emissions of all types, whether solid, liquid or gas.'

'This is the only way we, as a community, will progress towards zero waste,' says White. 'Landfill sites take up space, they

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A rubbish truck unloads raw municipal waste at the UR-3R facility. Global Renewables

Progress

smell bad and they're often leaky – they are pollution time bombs, and many countries are rightly shutting them down. The UR-3R Facility, on the other hand, turns your garbage bin into a recycling bin ... transforming a 100-year tradition.

So what's so special about the UR-3R Process®? There are other effective alternative waste technologies running in Australia, including those offered by companies such as Thies, Collex, Sita and Rethmann, as alternatives to landfill. The Global Renewables technology, however, is different in that it consists of a unique complementary suite of mechanical and biological technologies that make the waste resources cleaner at every stage of the process and maximise resource recovery from each component of the waste stream.

When the waste comes on site, the garbage bags are mechanically opened and the separation process, using Italian separation and composting equipment, then recovers various types of recyclables by reference to their size, shape, magnetism, density, emissivity, colour, rigidity, and so on. To perfect this, the company has undertaken extensive 'characterisation' of Australian waste – it knows our garbage.

The waste is treated gently to enhance recovery of recyclables and shredding and mixing are minimised. The organic component is put through the ISKA® Percolation process (German technology), which cleans and deodorises it, then generates renewable energy from the liquid product and quality compost from the solid product (see diagram).

The company cites many positive environmental outcomes of the UR-3R infrastructure. It reverses the flow of carbon and nutrients from the bush to the city, closing the carbon loop. The carbon and nutrients are returned to agricultural soils and society avoids the impacts of extracting virgin resources for the manufacture of

metals, glass, plastics and paper. Biogas is also produced by the Percolation process and is used on-site to generate renewable electricity to run the facility, with some export into the grid as well.

'Reductions in greenhouse emissions from the Eastern Creek facility are staggering,' says White. 'It is the equivalent of taking 50 000 cars off the road each year. We have forward sold the carbon credits to BP Australia and Mitsui.'

Listing environmental benefits, Global Renewables says the Eastern Creek facility:

- reduces greenhouse gas emissions by 300 000 tonnes a year
- diverts about 70% of waste from landfill
- recovers an extra 23 000 tonnes of recyclables per year
- produces 23 500 tonnes of compost and fertiliser products
- generates 17 000 megawatts of green electricity a year – equivalent to providing 2250 homes with year-round power.

It is an environmentally sustainable alternative to a modern landfill or bioreactor landfill, both of which ultimately bury the waste in a hole in the ground. A 2002 Greenpeace report on mechanical-biological technology says it is preferable to incineration and landfilling in terms of toxic emissions, climate aspects, material conservation and energy conservation.

Asked about inherently recalcitrant waste components, such as nappies and plastic bags, Mr Peter Eggleston, of GRD Limited, is optimistic of progress.



The UR-3R facility receives and processes collected household, commercial and green waste, using a suite of the world's best technologies, to produce a range of recycled products, renewable energy and compost, known as organic growth media. Global Renewables

'Importantly, the UR-3R Process® captures the plastic bags and compacts them which means there is a reliable supply of material that makes possible a viable end-use,' says Eggleston. 'We aren't home yet, but we are talking to people now and there are some interesting market possibilities.'

'Disposable nappies, making up 3% of waste, are also problematic, but following research by Professor Bruce Stanton, at the University of Sydney, we are looking at markets for commercial use of the absorbent material as an additive to improve soil moisture retention,' he says.

The Eastern Creek facility has one last claim to fame that few, if any, landfills, incinerators or even bioreactors can make – it has been warmly welcomed by the local community! Development consent was obtained without a single submission opposing the project and the Horsley Park Community Group requested that it operate at its 'maximum possible level'. The company says this reflects the facility's design, which aims to minimise odour, dust, noises, pests, litter and wastewater ... and hence also community outrage.

More facilities of this type are expected to be rolled out over the next five years. Global Renewables is the preferred tenderer to provide a state-of-the-art recycling facility near Melbourne and it is one of two companies short-listed to supply several recycling plants for the Lancashire County Council in the United Kingdom. Corporate sustainability seems to be paying off.

More information:
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Left: German made ISKA® Percolation machines clean and deodorise the organic garbage components generating renewable energy and quality compost. Right: Valuable quantities of retrieved, recyclable paper and cardboard product get sold on from the UR-3R facility. Global Renewables