

## Let's Get Wasted

Carbon strategies can come in many shapes and sizes, reflecting different approaches to the challenge of better protecting the environment. For instance, a Ricoh factory located at the heart of the industrial revolution in the UK is a leader in the charge to develop green practices. The Ironbridge Gorge near Telford, in England, is known as the birthplace of industry and it was here that the technique for making top quality iron using coke in place of coal was perfected.

The Ironbridge Gorge is also home to one of Ricoh's biggest European factories. The Ricoh plant has been a zero waste site since September 2002 so we foolishly braved the British railways to go to Telford and learn more. Despite the toe curling cuisine and mysterious beverages that are the hallmark of rail travel in the UK, we left Telford impressed. Ricoh is not alone in its recycling efforts, but in its factories it's been at it for a long time.

Ricoh UK Products Limited (RPL) was established in 1984 and employs 900 people, of whom around 10% are temps working at sites in Telford and nearby Wellingborough. The division generated €200 million in sales in 2007 and expects this figure to have reached €335 million for 2008. The Telford factory manufactures multifunctional office equipment, OPC drums and toner. Machines made here are manufactured on a Just-In-Time (JIT) basis in response to sales in RPL's regions.

This factory is also responsible for the assembly of the Pro C900 colour digital press, Ricoh's flagship product for the commercial printing business. The Pro C900 is Ricoh's first machine to be built to order and delivered direct, a production model that will be used for other press manufacturing in the future.

The Telford factory achieved zero waste to landfill in 1991 and has been ISO 14001 accredited since 1996. Since 1994 it has also been responsible for reconditioning and recycling machines, with recycling of toner cartridges since March 2007. All Ricoh factories around the world are rated as sending zero waste to landfill sites and, in

common with the company's competitors, comply in Europe with the WEEE directive (more about this later).

RPL's aim is to turn raw and recycled materials into products for distribution and sales in the European marketplace and some parts of Africa. Around 1200 Ricoh products including 200 copiers and MFPs are returned to the Telford factory every year. Over 80% of printers coming out of this factory are made up of recycled parts, from electronics to paper feeder trays and even packaging.

The JIT manufacturing model is common to all Ricoh factories, as are product recycling and efforts to reduce energy consumption. Over 200,000 Ricoh products get recycled every year, and over 99.5% of these are subsequently fully recovered or reused in a new machine, with strict quality controls in place to make sure that all parts reach quality assurance standards.

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Reusing materials from old machines to create new ones saves Ricoh an estimated 40% of the raw materials costs on new products. In some Ricoh photocopiers an average of 88% of the machine is recycled material. This is great from an environmental perspective, and it increases the profitability of each machine sold, so it's also good business.

The Telford site recycles 93.5% of factory-generated waste. The balance is incinerated, generating heat for the factory and the plant has reduced energy consumption by 35% over the last five years. Plans are in place for a 3% reduction every six months over the next three years and the company has various projects underway to help achieve this goal, all of which are expected to pay for themselves.

These projects range from employee-driven local environmental initiatives, to Ricoh Corporate's cell

production system for manufacturing the right product quantities in numerous variations, doing away with conveyor belts and reducing power consumption. Recycling contributes around €3.5-4.5 million to RPL's €200 million turnover, and the company is developing further recycling initiatives to increase this contribution.



*Colin Weaver, engineering general manager, is the man in charge of the plant and as such is responsible for much of the work that's been done there.*

### **The WEEE directive**

Ricoh is not unique in its efforts. The WEEE directive requires all European manufacturers of electrical and electronic goods to manage disposal of electronic goods, so like Ricoh, companies such as Xerox, HP and Canon have reuse and remanufacture policies in place. Xerox has set up what it calls the Shamrock process for machines that come back from customers. As with Ricoh, returned Xerox machines get cleaned and prepared for recycling and remanufacture. This involves stripping each one down to the nuts and bolts and reusing anything and everything possible in a new build. At Xerox's Dundore plant in Ireland, which serves the European market, 90% of the equipment coming back gets reused, including the circuit boards.

Xerox and Ricoh use a facility in Holland where materials are assessed and categorised according to their condition, prior to getting shipped off for remanufacture and recycling. For both Ricoh and Xerox the machines that can't be remanufactured are stripped for parts or turned back into raw materials. Plastics are either ground down for reuse or sold on as a commodity to third parties.

Indeed, the likes of Ricoh, Xerox, HP and Océ deliberately design their products so that components can be reused. The design teams are also responsible for defining the remanufacturing processes involved, so product designers develop product concepts, taking into account the life of a machine, its components and the reusability of the raw materials involved. Xerox, for example, applies the same principal at all of its development sites, even though the manufacture of some low-end products is subcontracted. Xerox is also licensed to remanufacture and reuse Fiery and Creo front ends, which extends its reuse principles to computer hardware as well.

Ricoh's environmental efforts go back a long way and are part of the company's corporate culture. But like Ricoh and Xerox, Canon and HP also have recycling and refurbishment programmes in place. HP provides free recycling of all electronic equipment, including computers, as long as customers are buying a replacement product. HP customers can return unwanted equipment to HP-designated collection points. Around 75 - 80% of materials in HP printing engines is recycled, and if the customer is not buying a replacement product, the customer can pay HP for recycling services. Costs for this, including logistics and special services (disassembly and/or controlled destruction of data), are calculated individually. More details are available from HP's dedicated recycling site: [www.hp.com/recycle](http://www.hp.com/recycle).

Canon has a stated commitment to the elimination of hazardous substances, resource and energy conservation and, like its competitors, is involved in various environmental activities. It was the first company to create in 1982 all-in-one toner cartridges for personal copiers, and then for laser printers. These cartridges include all essential components, and can extend the life of the printer. Canon started its toner cartridge recycling programme in 1990 and began remanufacturing and reconditioning copiers in 1992 at factories in China, Japan, America and Europe.

Canon is developing reconditioning bases elsewhere and expanding its scope to include printed circuit boards, fixing rollers and other parts. The company is also undergoing structural changes to incorporate product

development, production and sales, distribution and service, into its reconditioning and remanufacturing policy. All Canon factories and sales organisations are ISO14001 accredited.

As can be seen from these examples planning and implementing a sound carbon strategy is no mean feat. It demands systemic commitment and organisation, and although Ricoh appears to be leading the way with its zero-waste-to-landfill factories, other manufacturers are doing their bit. Commitment is manifest in different ways so there really is no clear leader.



*Gardens at the Telford plant are watered with recycled water and screen the windmills and solar panels that provide the energy to keep water flowing from ponds to the irrigation system.*

For example, none of HP's factories are zero rated for waste at the moment; carbon offsetting and carbon neutrality are not something that the company is investing in yet. Yet HP is substantially reducing its environmental footprint by reducing waste generated by its operations at the source. HP's largest sites separate waste materials for reuse and recycling with only 12% of its waste going to landfill. HP's non-hazardous waste program saved the company \$7.5 million in 2007, 60 percent of which came from reuse and savings in landfill costs and some 40 percent was revenue from selling materials to recyclers.

These are all promising initiatives but they are just the start. Remanufacture, reuse and recycling make shrewd financial sense. There is a sound economic reason to design machines to be easily recycled and their components compatible across models. It helps save in raw materials

and landfill costs, and in production efficiency, and it helps reduce a company's carbon footprint while improving margins on new machines. Whatever the motivation, manufacturers are helping to take the industry towards a greener manufacturing ethic, and this has to be a good thing.

– **Laurel Brunner** 