

## Closing the recycling loop

There are a number of myths about recycling that are frequently mistaken for facts, particularly when it comes to paper. The two most common are that using recycled paper saves trees, and that recycling paper is harmful to the environment because of the bleach used to get the ink off, neither of which are true.

Then too there is the perennial question of whether it's better for the environment if we use recycled paper or

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paper made with pulp from sustainably managed forests. The answer lies in striking the right balance: paper fibres cannot be recycled indefinitely and virgin fibres must be brought into the cycle to keep it going.

A further problem is the misconception that recycled paper is of poor quality for printing. De-inking technology has advanced rapidly over the past few years, as has print technology, and quality has improved accordingly.

And of course, another consideration is that if we don't recycle the paper, what else can we do with it?

### Why recycle?

Using recycled paper does not save trees. Most fibre for paper made in Europe comes from managed forests, in which trees are a crop, planted for the purpose of providing timber. Claims stating that a paper comes from a forest that is sustainable because 'two trees are planted for every one used' are misleading – that is a commercial decision and nothing to do with environmental concerns. It's next season's crop.

Sustainable forest management looks beyond financial considerations and embraces environmental concerns – protecting ecosystems and biodiversity – and also

social concerns, both for workers and local peoples. Paper cannot be safely accepted as coming from a forest managed in such a way without evidence, which is where forest certification comes in, and chain of custody to ensure that the fibre can be traced back right through the production chain from printed product to the forest it came from.

However, recycling paper does maximise the use of fibre from a given forest. There are still areas where virgin forest is cut, and some of it used for papermaking. But these, sadly, would be cut regardless of how much recycled paper we used – commercial loggers will simply find someone else to sell to, and many are clearing the land for another purpose. Other means are needed to address this issue.

Instead, the strongest reasons for recycling paper are that it is a more efficient use of our resources and it reduces waste. Recycling helps us get the best possible use from the wood fibre, and in doing so reduces pressure on forests and other resources. It leads to less use of landfill, reduces greenhouse gas emissions, and avoids wastefulness.

One of the greatest opportunities for the printing industry to become truly sustainable lies in the fact that the main raw material, paper, is both renewable and recyclable. To fully realise this, the paper has to be recycled at the end of its life, and someone has to buy it. If the loop is not closed, the whole scenario falls down. The printing industry has an excellent record for recycling paper – and a great opportunity to support the whole process.

In the UK, the main means of disposal of waste, over 62%, is still to landfill – essentially stuffing our waste into large holes in the ground. But the latest calculations by the Environment Agency, the Government body responsible for regulating environmental issues, show that landfills in England and Wales have an average of seven years' space left. Nor is it easy to find new landfill sites as no one wants a new landfill site opened near them. Nor do people want incinerators operating near their houses, which is the only other option if we don't recycle. The latest figures from the UK's Environment Agency, for 2006, showed that Britain is recycling more, but still less

than 27% of waste. (At the end of 2008 a sharp fall in prices for recovered materials, believed to be linked to the global economic crisis, was causing concern amongst



*Active tipping area of an operating landfill in Perth, Western Australia.*

UK Local Authorities and the recycling industry in general. The UK Environment Agency chairman, Lord Chris Smith, was urging local authorities to "hold their nerve" and continue to invest in recycling services.)

In mainland Europe, the picture overall is better: the European Environment Agency's latest analysis, published in 2007, shows an average of 36% recycled, with variations from country to country, Austria having the highest recycling and composting rate. Incineration with energy recovery is more prevalent, with countries such as Denmark having banned the landfilling of waste suitable for incineration in 1997 – and it now provides 4% of total energy consumed. But still mainland Europe landfills 45% of its waste.

The figures are in a similar range in the US where, according to the Environmental Protection Agency, in 2007 54% of municipal solid waste was landfilled, with 33.4% recovered and 12.6% incinerated with energy recovery.

What does all this boil down to? We throw a lot of stuff away. We will soon have a big problem with finding an 'away' to throw it to – and yet up to 90% of the content of any company's skip is recyclable. What a waste...

If we are to avoid having to open new landfills or build new incinerators, we need to recycle as much as we can. Paper forms a substantial proportion of what gets thrown out. It is also biodegradable, which means it breaks down in landfill and gives off methane – a greenhouse gas 25 times more potent than carbon dioxide – another very good reason to avoid burying it. In 2005, greenhouse gas emissions from waste management represented about 2% of the total emissions in the European Union, according to a European Environmental Agency briefing at the start of 2008. We also have to segregate carefully – to make a good quality recycled product, good quality ingredients are needed.

### **Environmental impacts of recycling**

Recycling does not use bleaching to get the ink off. The stage of papermaking that involves the most bleaching is taking chips of wood and removing the lignin – the substance that turns newspapers yellow – to make pulp for what are confusingly called 'wood-free papers'.

Making virgin paper also uses considerable amounts of water, energy and other processing chemicals. Recycling uses less – if you can imagine what's involved in turning wood into paper, and compare it with mashing old paper up to make new paper, it makes sense. The most common printing method is still litho. Oil-based inks are separated from the paper by flotation or washing, with centrifuging to remove contaminants. Papers may also be bleached at a later stage, particularly printing and writing papers, but, in Europe at least, an oxygen-based bleach such as hydrogen peroxide is used and the process is totally chlorine-free. Recycled fibre does not require the amount of bleaching that virgin pulp needs.

A lot of research has taken place to determine which is the best life cycle scenario: virgin paper and disposing to landfill; virgin paper and incineration with energy recovery to use it as a fuel; or recycling. The Waste and Resources Action Programme (WRAP), a UK Government-backed not-for profit organisation, published a study in 2006 of a number of such life cycle analyses from all over the world: 108 were evaluated, and nine studied in detail, comprising 68 scenarios. The overall conclusion was that

the recycling option is the better environmental choice. It even uses less energy. This does not mean that any recycled paper will have a lower carbon footprint than any virgin paper – on an individual basis it depends on the energy source, which will vary according to the type of paper and where it's made.

The other major question that often arises is transport. The UK is reliant on imports for the greater part of its pulp and paper, particularly printing and writing grades – increasingly so as mills close. Britain is also now exporting increasing amounts of waste paper for recycling – up to 4.7 million tonnes in 2007, with more than half of this going to China. So does this change the numbers? WRAP carried out another study to find out, the results of which were published in August 2008.

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The study looked at both paper and plastics, and found that, even including the carbon emissions of transporting the waste to China, recycling is still preferable: the emissions from transport for both were less than a third of the savings from recycling. If you then take into account the fact that such waste is usually return ballast in containers that have come over carrying export goods, and which would otherwise return empty, the numbers look even better.

This movement of recovered paper is not unique to the UK: CEPI, the Confederation of European Paper Industries, reports in its 2007 annual statistics that 2006 saw 13.2 million tonnes of recovered paper headed towards China from North America, 3.9 million from Japan and 8.2 million from Europe. Although China has a far lower consumption of paper per person than any of these areas, overall it is second only to the US in overall consumption, and growing, according to the China Paper Industry's Paper Report of 2006-7. Yet China has sparse forest cover, unlike North America, Europe and Japan.

Within Europe there is also a great deal of movement, related to fibre source. Again, this is because some countries have more forest and fewer people, while others,

often with less forest, have denser populations allowing better access to used paper to recover – especially where there are large cities, often termed 'urban forests'.

Virgin paper and pulp, too, are regularly exported across the globe by the major paper producing countries: paper is a truly global commodity.

A final point sometimes raised is whether or not to de-ink recycled paper. Why not downcycle all waste paper into lower grades, such as cardboard or something that does not require so much processing? The answer is that a very high proportion of that is already made from recycled fibre. That market is saturated, whereas the overall percentage of recycled content in graphics papers is still low – so this type of paper is seen as the best opportunity for expansion.

## Recycled qualities

Recycled paper is quite a loose term. There is no definitive requirement for a certain percentage of recycled fibre before a paper can be called recycled, although there are numerous guidelines and recommendations. For some types and weights of paper the challenges of introducing recycled fibre is greater than for others. Paper can, however, be selected according to requirements – with some excellent qualities available using varying percentages of recycled content, including some which are a mixture of recycled fibre and virgin with FSC or PEFC chain of custody certification. Many are visually indistinguishable from virgin papers, while others are lower white and have more of a 'recycled' look. Printability is not the issue it used to be, and not just for general commercial printing: demanding documents such as corporate brochures and financial reports that have been printed on recycled papers have won awards for quality in recent years,

So there are many strong arguments for recycling – extending the life of the fibre, maximising use of valuable resources, saving energy and carbon emissions. There is also the need to use recycled content paper to close the recycling loop, and no reason not to do so with the qualities available today. And as for choosing between using recycled or virgin paper from certified forests: why not use both, choosing according to end use? You can

even use papers that are a mixture of both, as more of these become available.

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