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Market Situation Report – July 2007

Realising the value of recovered paper

Welcome to the recovered paper Market Situation Report, the second in our series of reports that examine current economic conditions in the recovered materials markets.

The report looks at the key factors influencing the UK markets for recovered paper and board (recovered fibre) over the past year or so, including developments in the domestic and overseas paper manufacturing sectors; changes in collection trends; and movements in prices. In addition, the report focuses in detail on the global market for recovered paper.

Key themes to emerge from the paper recycling sector in 2006 are:

- the continued contraction in the UK paper manufacturing industry and, as a consequence, the decline in the volume of recovered fibre used by UK paper mills;
- the growth in net exports of recovered fibre from the UK, particularly to China, with exports of recovered fibre overtaking domestic use in 2007;
- slowing growth in the volume of paper recovered from the UK waste stream, from a yearly average of 10 per cent between 2002 and 2005 to 3 per cent in 2006; and
- increases in the prices of recovered fibre reflecting strong export demand.

Did you know?

55% — **55% of paper and board consumed in the UK is collected for recycling.**

10mt — **10 million tonnes of CO_2 emissions are saved by recycling paper, the equivalent of taking more than 3 million cars off the road.**

£ — **Typical prices of recovered paper (as at June 2007):**
Mixed papers:
£40-£60 per tonne
News and PAMs:
£60-£70 per tonne
Corrugated casing:
£55-£70 per tonne

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Plastic Summer 2007

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Market analysis

Recent developments in the UK paper manufacturing sector

UK paper manufacturers produced 5.6 million tonnes of paper and board in 2006 (Table 1) which together were worth around £3 billion. Newsprint and other printings and writings (P&W) paper together account for almost half of the paper manufactured in the UK whilst packaging paper and board account for another third.

The UK's paper manufacturing sector has been shrinking for over a decade, and this trend continued in 2006. Paper and board production declined by 7.5 per cent, as seven mills were closed. High energy prices accelerated the longer-term reduction in capacity, which in turn reflects the relocation of manufacturing to lower cost economies. Production declined most sharply in the packaging grades, while tissue production rose marginally, a pattern that was mirrored across the rest of Europe. Over the past decade, paper production in the UK has fallen by around 10 per cent, while turnover and employment have fallen by 20 per cent and 45 per cent respectively.

Although at least one further mill closure has been announced during 2007, there is some tentative evidence that the UK paper manufacturing sector is beginning to attract new investment. For example, three manufacturers have recently announced plans to build new newsprint mills or machines.

In 2006, the UK's total consumption of paper and board products was about 13.9 million tonnes, 2% lower than in 2005.

Paper and board consumption in the UK

About 14 million tonnes of paper and board products were consumed in the UK in 2006, 2% less than in 2005 (Table 2). Directly measured consumption of paper and board was about 12½ million tonnes, of which 4½ million tonnes was manufactured in the UK and 8 million tonnes was imported to be converted into final products. A further 2 million tonnes of paper and board was estimated to have entered the country either in the form of converted products (such as book and magazines) or as packaging for other manufactured goods (eg toys).

Paper recovery in the UK

Over 8 million tonnes of paper and board were recovered from the UK's waste stream in 2006, more than half of the total paper and board consumed. Around one-third of the paper recovered was old newspapers, periodicals and magazines (news and PAMs), while another third was packaging material. The collection rate[1] is estimated to have grown by 10 percentage points over the past 3 years (Graph 1). Growth in the volume of paper and board recovered – which averaged over 10 per cent per annum over the previous four years – slowed to only 3 per cent in 2006. However, recent data suggest that the growth rate picked up again in the first quarter of 2007.

The UK's recovery rate is broadly in line with the European average. Across Europe as a whole, some 54 million tonnes of recovered paper were collected in 2005.

The majority of recovered paper and board – about 5.5 million tonnes – is collected from commercial and industrial companies.

[1] *Defined as collection/consumption*

Table 1: UK paper manufacturing industry

million tonnes

Paper grade	Volume
Newsprint	1.1
Printings and writings	1.4
Tissue	0.8
Packaging	2.0
Other paper and board	0.3
Total	**5.6**

Source: CPI, 2006.

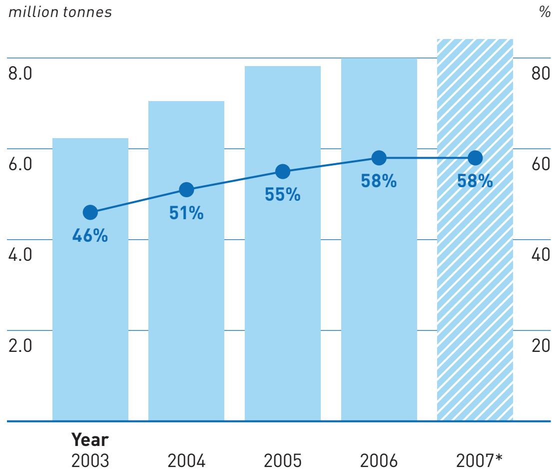
Table 2: UK consumption of paper and board

million tonnes

Paper grade	2005	2006
Newsprint	2.6	2.5
Printings and writings	4.7	4.6
Tissue	1.1	1.1
Packaging	3.8	3.7
Other paper and board	0.3	0.4
Apparent consumption of unconverted paper and board[1]	**12.5**	**12.3**
Net imports of converted products[2]	1.1	0.9
Net imports of packaging around other goods	0.6	0.7
Estimated total consumption	**14.2**	**13.9**

[1] *UK home sales plus imports.* [2] *For example, books and magazines.*
Sources: CPI, HM Revenue and Customs and CERES Logistics.

Graph 1: UK paper recovery



Source: CPI. Collection rates are based on estimates of total consumption that include indirect imports.
**2007 forecast based on Q1 outturn.*

Tonnes recovered
Collection rate (%)

Table 3: Paper and board recovered from the UK municipal waste stream (2005/06)

thousand tonnes

Region	Kerbside	Bring/CA sites	Other	Total
England	1,670	407	46	**2,123**
Wales	63	29	8	**100**
Scotland	159	67	13	**239**
Northern Ireland	48	9	1	**58**
Total	**1,940**	**512**	**68**	**2,520**

Note: 'Other' includes municipal collections of commercial, industrial and other non-household waste. Data include an assumed paper and board fraction from co-mingled collections.
Sources: WasteDataFlow and SEPA Local Authority Waste Arisings Survey.

Table 4: Trends towards kerbside and co-mingled paper collections in England

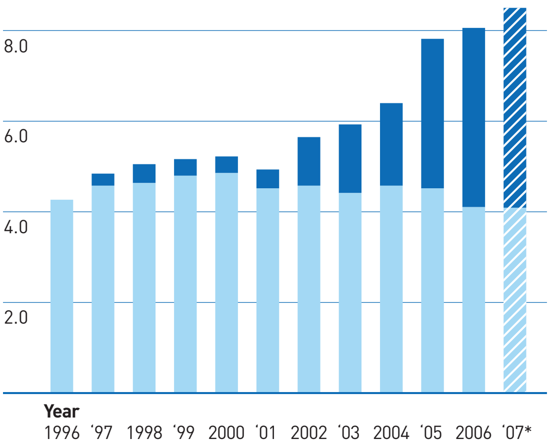
thousand tonnes

Collection	2003/04	2005/06
Kerbside	1,118 (75%)	1,670 (79%)
of which co-mingled	*289 (19%)*	*626 (29%)*
Bring/CA	347 (23%)	407 (19%)
Other	20 (1%)	46 (2%)
Total	**1,485** (100%)	**2,123** (100%)

Sources: DEFRA and WRAP estimates.

Graph 2: Domestic use and export of recovered paper

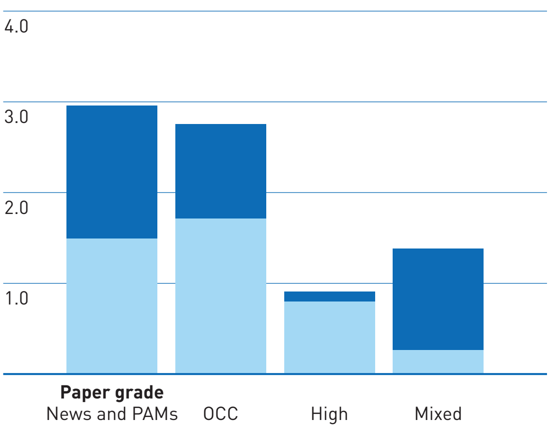
million tonnes



Sources: CPI and HM Revenue and Customs.
**2007 forecast based on Q1 outturn.*

Graph 3: Utilisation of different recovered paper grades

million tonnes



Source: CPI, 2006.

It is estimated that the retail sector accounts for 40 per cent of the total (likely to be predominantly packaging), while the publishing and office-based sectors each account for about 15 per cent (largely unsold news and magazines and printers' waste).

Slightly less than one third of the paper recovered for recycling in 2006 – some 2.5 million tonnes – came from the municipal waste stream (Table 3). Municipal collections of paper in England have risen by over 40 per cent over the past two years, with the growth largely reflecting the increasing ubiquity of kerbside collection schemes (Table 4). In 2005/06, almost nine out of ten local authorities offered kerbside collection schemes collecting paper, and around two thirds of those collected paper (or mixed paper and board) separately from other materials. However, the proportion of paper that is collected co-mingled with other materials is estimated to have grown from around 20 per cent in 2003 to almost 30 per cent. And it is striking that three quarters – and possibly more – of all mixed paper recovered is collected by local authorities.

Recycling the UK's recovered paper

About half of the paper and board recovered in the UK (4.2 million tonnes) was used by the domestic paper manufacturing sector, with most of the rest (3.8 million tonnes) exported for closed loop recycling overseas. Small amounts of recovered fibre are also used to manufacture moulded paper pulp products (such as egg boxes) and insulation, and some is composted. However, at present these markets are believed to consume only around 1 per cent of the paper recovered in the UK.

Consumption of recovered fibre at domestic mills has fallen by around 15 per cent since its peak in 2000, and by 8 per cent in 2006 alone (Graph 2). The fall in consumption in 2006 was broad based across all the recovered paper grades. The decline in recovered fibre usage primarily reflects the fall in paper production in the UK and utilisation rates[2] actually increased slightly over this period.

By contrast, exports of recovered paper have grown rapidly in recent years and it is expected that in 2007 more paper will be exported than is reprocessed in the UK. The proportion of paper that is exported differs markedly across different grades of material: for example, over 80 per cent of mixed papers were exported compared with less than 20 per cent of high grade (eg office) papers (Graph 3). This may be, in part, because the markets for the lower quality paper that is produced from some mixed grade fibres are primarily in developing countries. The global market for recovered paper is analysed in more depth later on in the report.

Typically, recovered fibre is recycled back into a similar grade of paper or board (Graph 4). The predominant use of recovered news and PAMs is in the production of newsprint, while packaging and mixed grades tend to be recycled into packaging materials. Tissue paper – which cannot be recovered – tends to be manufactured from high grade papers in the UK although news and PAMs are also used elsewhere in Europe. The closed loop nature of paper recycling reflects a combination of: the existing collection infrastructure (for example, arrangements for the commercial collection of old corrugated casing (OCC) or newspaper bring sites sponsored by newsprint manufacturers); the differing physical properties of the different paper grades; and a desire to divert material towards the most valuable use. On average, paper can be recycled around six times before the fibres become too short to be reused.

Of the recovered fibre used by the UK paper industry, almost half is used in packaging manufacture while a further third is used in newsprint manufacture. The majority of the remainder is used in tissue manufacture.

In 2006, UK paper mills had an average utilisation rate of around 75 per cent, one of the highest rates in Europe. Newsprint mills had a utilisation rate of around 130 per cent (the apparent surplus reflects process losses) implying a recycled content of 100 per cent. Many packaging papers also have close to 100 per cent recycled content. In contrast, tissue paper and printings and writings paper have utilisation rates of only about 50 per cent and 10 per cent respectively.

Prices

Prices for recovered paper vary by grade, being higher for segregated grades of paper – such as OCC or newsprint – than for mixed paper grades. Export prices tend to be higher than prices paid by domestic mills (Graph 5). This partly reflects the currently strong demand for recovered paper in countries such

Did you know?

8mt 8 million tonnes of paper was recycled in 2006, compared with 7 million tonnes in 2004 and 6 million tonnes in 2002.

75% 75%: UK paper manufacturers' recovered fibre utilisation rate.

50% 50% of the paper and board recovered from the UK waste stream is used by domestic mills while the remainder is exported for recycling overseas.

6x On average, paper can be recycled around six times before the fibres become too short to be reused.

as China and India. However, it also reflects the additional risk of exporting material rather than supplying domestic mills. For example, there are few long-term export contracts, so neither the buyers nor the prices are guaranteed. In addition, if a load is rejected owing to poor quality, repatriation will be at the exporter's expense.

Prices for all grades of paper – including mixed paper – have increased in recent months (Graph 6). This supports market anecdote that the increase in prices reflects strong demand from importing countries rather than a generalised scarcity of segregated paper stemming from an increase in mixed paper collections. However, recovered paper prices tend to be correlated with virgin fibre prices which have also increased in recent months.

Notwithstanding the recent price increases, recovered paper prices have been relatively stable in recent years compared with the early 2000s, despite extensive change in the markets for recovered paper. It is possible this price stability reflects the growing maturity in the market. But it may also be that the simultaneous growth in the demand for recovered fibre and in the collection rate has coincided with a period of stability in paper and pulp markets more generally, in which case future imbalances in the demand and supply of recovered fibre could lead to renewed volatility in recovered paper prices. One way to manage such volatility might be for buyers and sellers of recovered fibre to seek to use long-term contracts or to use financial risk management tools – such as derivatives – to hedge prices.[3]

Reprocessors and exporters of recovered packaging paper and board are able to sell packaging recovery notes (PRNs). In 2006, PRNs were issued for around 2.9 million tonnes of packaging paper and board destined for domestic reprocessing or export. Prices for paper and board PRNs fell steadily throughout 2006, from an average of around £10 per tonne to about £2 per tonne. So far in 2007 prices have stayed low.

The challenges ahead

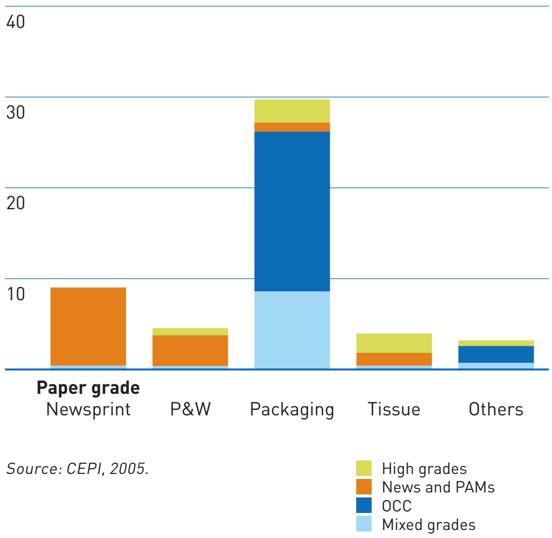
A key challenge facing the paper recycling sector is how to maintain the quality of paper collected in the face of the trend towards single stream (co-mingled) collection. At present, importing countries appear to be willing to accept mixed grade paper, but further deterioration in quality, changes in export or import regulations and competition from other exporting countries all pose risks to the market. WRAP is working with stakeholders to help define a publicly available specification (PAS 105) for recovered paper that may help address some of these issues.

[2] *Defined as recovered fibre utilisation/production.*

[3] *For more information about financial risk management tools see Pöyry (2007) 'Managing risks in the recovered fibre market', forthcoming publication from WRAP.*

Graph 4: Utilisation of recovered paper in Europe

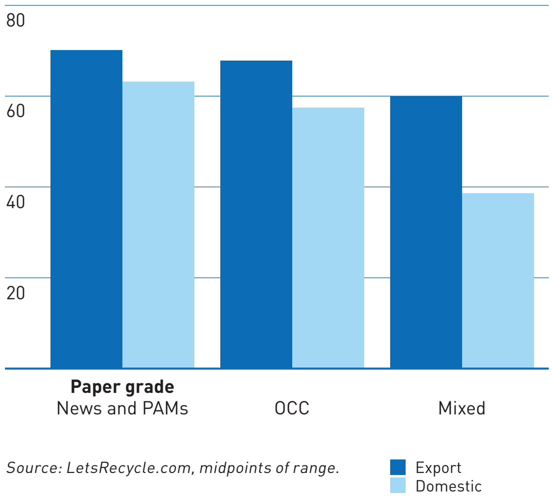
million tonnes



Source: CEPI, 2005.

Graph 5: Recovered paper prices (June 2007)

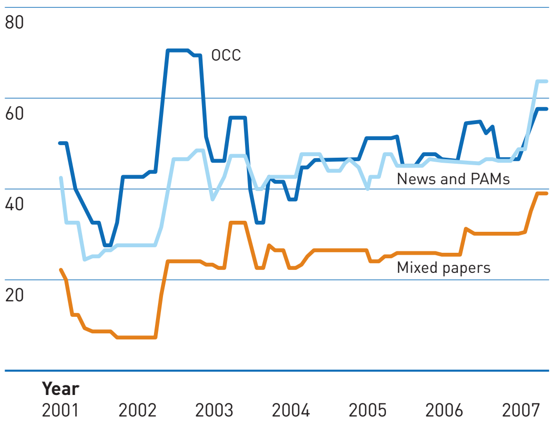
£ per tonne



Source: LetsRecycle.com, midpoints of range.

Graph 6: Recovered paper prices

Prices paid by UK mills, £ per tonne



Source: LetsRecycle.com, midpoints of range.

The environmental benefits of paper recycling

When compared with the environmental impact of producing paper from raw materials and disposing of it post use via incineration or landfill, there are clear environmental benefits to producing paper from recovered fibre.

Pulp and paper production is an energy intensive activity but remanufacturing paper from recovered fibre leads to significant reductions in energy consumption. On average, producing paper from recovered fibre uses about half of the energy required to produce paper from virgin tree fibre, even taking into account the energy that can be recovered if the latter is incinerated post use. The savings arise because most of the energy used in papermaking is consumed during the pulping stage. Moreover, because pulping removes up to 50 per cent of the mass (and hence embodied thermal energy) of the wood, there is less energy to be captured through incineration.[4]

In addition to using less energy, recycling paper uses less water than producing virgin paper, and produces less air and water pollution.

Furthermore, recycling paper is significantly more environmentally beneficial than allowing it to biodegrade in landfill, where it produces methane – a far more potent greenhouse gas than CO_2.

It is estimated that the 8 million tonnes of paper recovered in the UK in 2006 saved around 10 million tonnes of CO_2 equivalent emissions, which equates to taking 3 million cars off the road.

[4] *WRAP (2006), 'Environmental benefits of recycling', http://www.wrap.org.uk/wrap_corporate/about_wrap/environmental.html*

Special report: Global markets in recovered paper[5]

UK exports of recovered fibre have grown rapidly in recent years as collection volumes have increased, whereas domestic recovered fibre use has fallen, in line with the contraction in the domestic paper manufacturing industry. Exports of recovered fibre from the UK increased more than eight-fold between 2000 and 2006, from 0.5 million tonnes to almost 4 million tonnes. The most rapid growth was in exports to China, which grew from almost zero in 2000 to be the destination of about half of the UK's recovered fibre exports and around one quarter of all the paper recovered in the UK (Graph 7).

This trend is expected to persist over coming years. UK collections of recovered paper are forecast to rise to over 10 million tonnes per annum by 2015, but domestic use is expected to remain broadly in line with current levels (Graph 8). As a result, the UK's reliance on exports is expected to continue to grow: by 2015, the UK is forecast to be exporting around 6 million tonnes per annum of recovered fibre. This special report looks in more depth at the drivers of this growth and the potential risks associated with it.

Current drivers of the global market for recovered fibre

The growth in exports of recovered fibre from the UK is part of a global phenomenon. International trade in recovered paper grew from 27 million tonnes to 42 million tonnes between 2000 and 2005 and is forecast to grow to 77 million tonnes by 2015.

The growth in the global trade of recovered fibre has two main economic drivers. First, paper manufacturing capacity is moving from Europe and North America – which have well developed and highly productive forest industries – to countries with lower manufacturing costs but more limited forest resources, in particular China and East Asia. This has created demand for raw materials – including recovered fibre – in these countries.

Second, there is a natural inverse relationship between trade flows of manufactured goods (and the material they are packaged in) and the trade flows of recovered fibre. As collection infrastructures have developed to meet legislative and other drivers of increased recycling, collections in developed countries of recovered fibre – and in particular of packaging material – have grown.

Reflecting these drivers, more than half of global trade in recovered paper is from developed countries to less developed countries. The US, which exported more than 14 million tonnes of recovered fibre in 2005, is the largest exporting country (Table 5). The UK, which accounted for 8 per cent of exports in 2005, stood at number three in 2005, but has now probably moved to second place.

China, with 17 million tonnes of imports in 2005, is the largest importing country. Chinese imports of recovered paper more than quadrupled between 2000 and 2005. This was driven by strong growth in domestic demand which in turn has fuelled rapid growth in both paper production and consumption. Elsewhere in Asia (for example, South Korea and Indonesia), by contrast, demand for imported recovered fibre fell or remained stable, because domestic collection rates improved but there was limited investment in new recovered paper utilisation capacity.

The outlook for global recovered paper markets

The outlook for the global market for recovered paper depends on developments in China. Global paper production and consumption are both expected to grow by one third over the next ten years. Half of this growth is expected to be in China, which by 2015 will be the world's largest producer and consumer of paper.

Globally, recovered fibre utilisation is projected to grow by 100 million tonnes – more than 50 per cent – over the next ten years as utilisation rates rise. China is again expected to be the main driver of this demand and its utilisation rates are forecast to rise by 15 percentage points to 78 per cent, amongst the highest in the world. Two thirds of the new recovered fibre utilisation capacity planned for 2005 to 2009 will be in China.[6] Two companies in particular – Dongguan Nine Dragons and Lee Man – have announced ambitious expansion plans, and have already added 6 million tonnes of capacity since 2005.

The combination of low labour costs, rising recovered paper value, strong demand and improving quality is expected to boost domestic paper collections in China. However, although recovery rates are expected to increase from around 30 per cent currently to 40 per cent in 2015, this will still leave China some way short of being self-sufficient in recovered fibre. As a consequence, Chinese demand for imported recovered fibre is forecast to grow to almost 45 million tonnes by 2015, when it will account for 60 per cent of imports of recovered fibre, but almost 80 per cent for some paper grades (Table 6).

The main dynamics in terms of supply are likely to be the continuing improvements in collection infrastructures and recovery rates. Recovery rates in North America and Eastern Europe lag behind those in Western Europe and an increase in the recovery rates in these countries is likely to drive supply.

The forecast 2 million tonnes of additional recovered paper exports from the UK represents only a small proportion of the possible 35 million tonnes of growth in the global trade in recovered fibre over the next ten years. So it is tempting to conclude that the reliance on export markets poses little risk to the UK.

However, the forecasts outlined above are very sensitive to the assumptions made about growth in production, consumption, utilisation rates and domestic collection rates: small changes in those assumptions could dramatically change the outcomes. For example, an increase in the Chinese domestic recovery rate of 2 percentage points by 2015 would lead to the collection of an additional 2.2 million tonnes of paper per annum. It is possible that this paper would primarily displace imports of lower quality recovered paper grades.

Moreover, as the global supply of recovered paper has been determined in large part by legislative drivers, supplies might not change in response to changes in demand. A shortfall in demand relative to supply could lead to sharp falls in price which may, in turn, have negative consequences for commercial paper recovery businesses.

The key consideration for the UK is that it should not be the marginal supplier of paper to China. If demand is lower than forecast, then it will be the marginal exporters – likely to be those with the highest cost and/or lowest quality paper – that will suffer disproportionately.

One way to mitigate this risk might be for collection agents and exporters to work directly with overseas-based paper mills to ensure that they collect and supply paper to the required specification. This is already happening in the US. US OCC has emerged as a preferred grade of recovered packaging fibre in China because of its high quality and reliable delivery, but its position is also being consolidated by ties between US collectors and merchants, and Chinese paper mills.

Conclusions

UK exports of recovered paper have grown considerably since 2000 as increased collection rates have coincided with the closure of domestic paper mills. Global trade in recovered paper has also grown considerably over the past few years as other developed countries improve their collection rates, while less developed countries increase their demand for recovered paper. These trends look set to continue over the next few years.

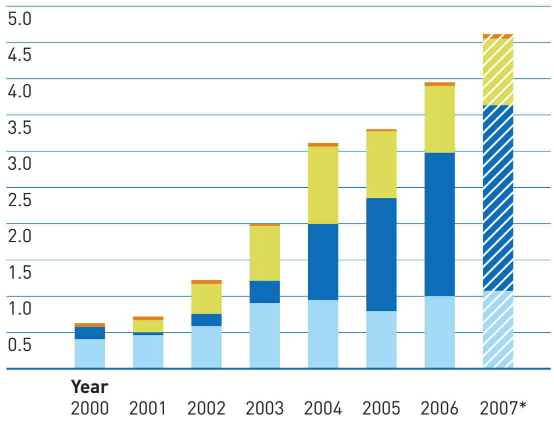
In the event of global demand for recovered paper falling short of supply, the UK can minimise the risk of marginalisation by ensuring it continues to collect paper that meets the required standards of importing countries.

[5] *This article draws extensively on Hawkins Wright & EU Consulting (2007), 'Assessment of the UK export market for recovered paper'; published by WRAP, June 2007.*

[6] *EU Consulting and Moore & Associates (2006), 'Outlook for Global Recovered Paper Markets'.*

Graph 7: UK recovered paper exports by destination

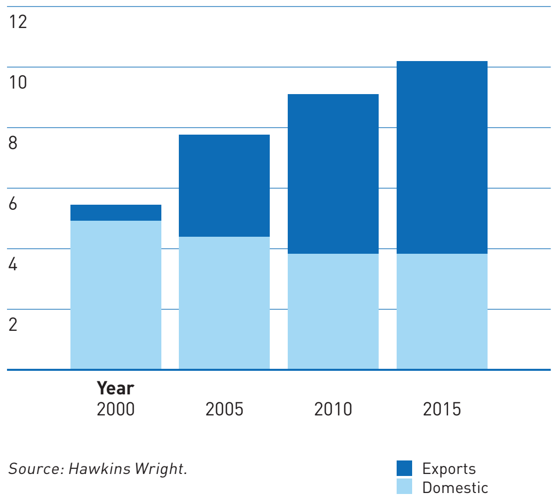
million tonnes



Source: HM Revenue and Customs.
**2007 forecast based on Q1 outturn.*

Graph 8: Outlook for UK domestic and exported recovered paper

million tonnes



Source: Hawkins Wright.

Table 5: International trade in recovered fibre in 2005

million tonnes

Net exporters		Net importers	
1. USA	14.6	1. China	17.0
2. Japan	3.6	2. Indonesia	2.0
3. UK	3.3	3. India	1.8
4. Benelux	1.4	4. Mexico	1.5
5. Germany	0.7	5. South Korea	1.3

Source: EU Consulting and Moore & Associates (2006).

Table 6: International trade in recovered fibre by paper grade

million tonnes

	2005		2015 forecast	
Paper grade	**Total**	**of which to China**	**Total**	**of which to China**
Old news and PAMS	14.0	4.7	23	10
Packaging	15.0	8.9	29	24
High grades	3.5	0.4	8	1
Mixed grades	9.8	3.0	17	10
Total	**42.3**	**17.0**	**77**	**45**

Sources: Hawkins Wright and EU Consulting and Moore & Associates (2006).

WRAP works in partnership to encourage and enable businesses and consumers to be more efficient in their use of materials and recycle more things more often. This helps to minimise landfill, reduce carbon emissions and improve our environment.

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Or to learn more about recycling, visit:
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