

## China's Wastepaper Imports and the Environment

April 2007 | Issue 7



FOREST  
TRENDS

Brian Stafford  
& Associates Pty  
Consultants to the Pulp &  
Paper Industry



### Environmental Aspects of China's Wastepaper Imports

*China is the number one importer of the world's wastepaper, taking in large amounts from the United States, Europe and Japan. Secondary fiber, comprised of locally-produced and imported wastepaper, now comprises 62.6% of China's papermaking fiber supply and is growing at an annual average rate of 12.5% per year. Imported wastepaper now makes up 33.1% of the total papermaking fiber supply, having grown at an annual average of 29.8% for the past four years. The majority of this secondary fiber is being used for packaging of China's burgeoning light manufactured exports.*

*The sheer volume of China's demand for wastepaper has been instrumental, not only in bringing stability to the market price-wise of wastepaper, but lifting those prices and thus incentives to invest in collection and processing facilities around the world. China has therefore been instrumental in keeping vast amounts of wastepaper out of land-fill worldwide -- approximately 65 million tons (Mt) of wastepaper over the past decade. This wastepaper would have replaced 27.2 million green metric tones of wood in 2006 alone.*

*Some of China's other fiber sources, however, such as pulp and pulpwood sourced from Russia and Indonesia, which while not constituting a large proportion of China's papermaking fiber supply, should be considered high risk as these sources are likely coming from natural forests with little guarantee of sustainable let alone legal management and production.*

---

### Background: The Dynamics of the Wastepaper Trade

*Secondary fiber:* The use of secondary fiber (local and imported wastepaper) has been expanding at an annual average rate of 12.5% per year since 2002. In 2006 secondary fiber composed the remaining 62.1% of the country's supply, standing at 37.1 Mt. Imported wastepaper is the fastest growing segment, with an average annual 29.8% increase and is now also the largest source (33.1%) of fibre for the Chinese pulp and paper industry. Domestic wastepaper production, although estimated to be growing quite slowly (because it is made for the most part from generally low quality vegetable fiber) is the second largest source of China's total fibre supply.

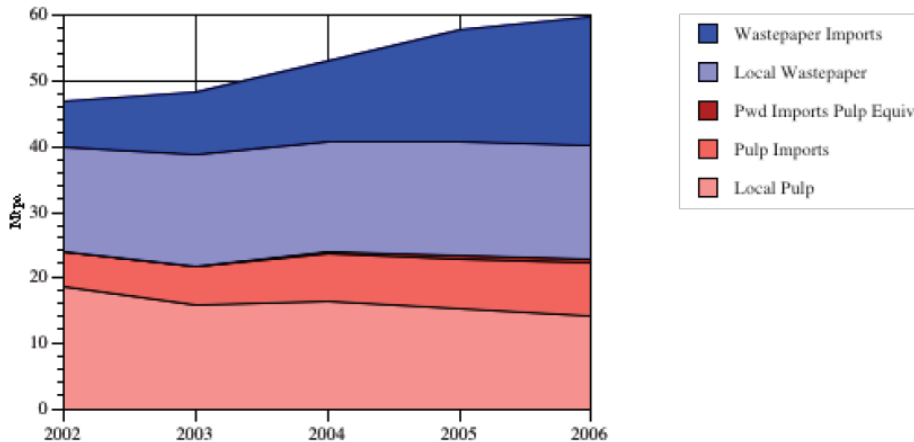
Composed mostly of low-strength vegetable fiber, pulp from China's domestic wastepaper is of poor quality and mainly used to create packaging for domestic shipments. China's primary need in importing wastepaper is to recycle it into export-grade packaging to send the vast volume of light manufactured products that it is exporting to the world. Given the paucity of China's virgin fiber resources, especially the strong, long fibred softwood necessary for packaging production, the quickest, cheapest and most effective means of fulfilling its needs is to import wastepaper (primarily used corrugated cartons from the USA and Europe), slush them up and run them over a paper machine again. The Chinese have built, and are continuing to build, some of the largest paper mills in the world (e.g.: 3 Mt of capacity on one site), running the biggest and most modern packaging paper and paperboard machines ever built.

To feed this very rapid increase in capacity, Chinese buyers have been integrating themselves into wastepaper markets in the USA, Europe and elsewhere. With its enormous softwood resources, the United States makes most of its packaging from virgin fiber and its waste stream is therefore rich in high quality fiber. Originally, the material destined for China was purchased through brokers, but in more recent times there have been instances of, for example, Chinese mills contracting directly with large supermarket chains. The wastepaper trade provides one of the few back-loads for the prodigious number of containers moving back to China from the rest of the world.

The forces driving the use of such a vast amount of wastepaper are likely market-based incentives. The use of wastepaper has enabled China to increase its output of packaging material in a relatively short-term, with relatively small investment involved compared to the financing needed to source virgin fiber from wood, and the lower price of the material itself relative to virgin pulp and pulpwood.

*Virgin fiber:* The use of virgin fiber, both domestically produced and imported, in China’s papermaking furnish has been declining at a rate of 1.2% per year 2002 (see Figure 1), mainly because of reforms to China’s traditional pulp and paper industry which have closed between four and five thousand highly polluting pulpmills which were venting effluent into the nation’s river systems. Virgin pulp and pulpwood now equals 22.6 kilotons (kt), approximately 37.8% of China’s fiber supply.

**Figure 1: Virgin vs. Secondary Fiber in China’s Papermaking Furnish: 2002 – 2006 (ktpa)**



Source: FAO, WTA & BS&A estimates

Domestic pulp production is estimated to contribute up to 29.5% of China’s current fiber supply, but there is little information available on just how much pulp is being produced locally. What is known is that most of it is vegetable in origin, of poor quality and low strength (most vegetable pulps are short fibre). It is also well known that these mills have been highly polluting, venting their effluents untreated into the nation’s river systems. The Chinese government has sought to combat the problem by forcing many (between four and five thousand) small mills (for which it would be uneconomic to install effluent treatment plants) to close and encouraging the larger ones to band together to build joint treatment plants.

Other than imported wastepaper (which is almost all destined for packaging of one form or another) the only significant source of high quality wood fibre is imported wood pulp. Although it constitutes only 13.5% of the papermaking resource it would be the most expensive element in the papermaking furnish and the one with the most significance for the future of the world’s natural forests.

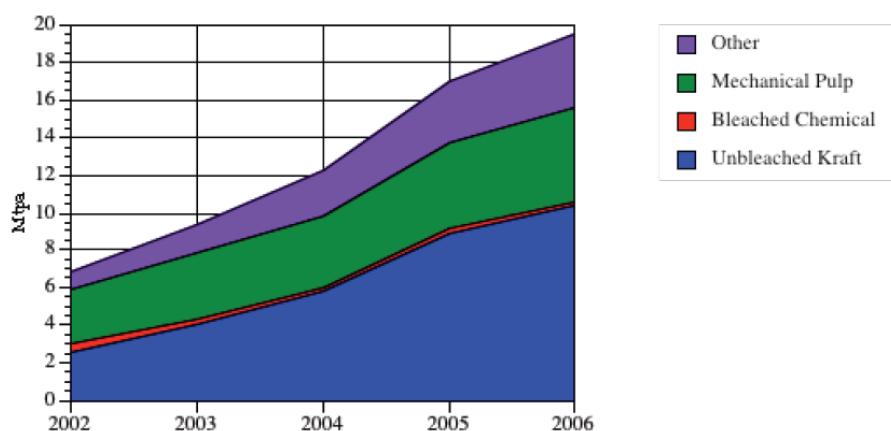
The proportion imported pulpwood makes of China’s total papermaking fibre supply (at less than 1%) is very small, but it has the potential to expand rapidly with deleterious environmental effects in some supplying countries. The trade is made up overwhelmingly of non-coniferous pulpwood. Under normal circumstances it is not economic to import pulpwood (which is 50% water) to make pulp and compete against the integrated low wood cost pulpmills of, for example, South America. China’s pulpwood imports appear to be taking place in response to a specific set of circumstances.

Both Asia Pulp & Paper (APP) and Asian Pacific Resources International Limited (APRIL) have built pulpmills in China, on Hainan Island and at Rizhou respectively. Typical of the development model employed by these companies, the pulpmills were constructed without an adequate local wood supply. The upshot has been that pulpwood has had to be imported. Presumably, being integrated operations (i.e., the pulp is made into higher products) the companies are able to absorb the excess cost involved in importing wood. It is possible that these companies are in the process of establishing local pulpwood plantations and that their imports of pulpwood are essentially a stop-gap measure until a local forest resource comes onstream, but there is no guarantee that they will succeed in establishing a local wood supply or if they do, that it will be sufficient to sustain the mill.

### Trends in China’s Wastepaper Imports

*Grade and Volumes:* Imports of unbleached kraft wastepaper (mainly old corrugated containers), which is the primary source material for recycled packaging grades, drive China’s wastepaper imports. Shipments of this grade have been growing at a very substantial 41% annual average since 2002 and they increased from 2.6 to 10.4 Mt between 2002 and 2006 (see Figure 2.) On the other hand, imports of secondary white paper (most likely office waste), represented here by the wastepaper grade ‘Bleached Chemical,’ are small and are actually in decline despite the high prices presently being paid. This white paper is most likely being converted into a white liner for packaging material, rather than being recycled into printing and communication grade papers.

**Figure 2: China’s Imports of Wastepaper by Grade: 2002 – 2006 (Mt per year)**



Source: *World Trade Atlas*

The ‘Wastepaper Other’ grade is also used primarily for packaging. It is mixed wastepaper (i.e. packaging material, old newspapers and magazines, etc.), which is used in the manufacture of corrugated containers. The short fiber of this mixture is stiff and adds crush resistance to the corrugated sheet. Imports of ‘Other’ wastepaper, although only about one-third those of unbleached kraft, have been growing faster – at an average of 45% per year.

Only the ‘Mechanical’ wastepaper category is used primarily to produce a paper grade other than packaging. It is an ideal furnish for the manufacture of newsprint and the so-called coated mechanical grades, which are used mainly in magazines and advertising catalogues. Whilst China’s import of this grade of wastepaper has increased from 2.9 to 5.0 Mt between 2002 and 2006, the growth rate has been only about one third that of the packaging grades.

Imports of solely packaging grades (all those other than ‘Mechanical’ wastepaper) have grown by a massive 10.6 Mt over the four-year period, from 4.0 Mt in 2002 to 14.6 Mt in 2006 – equal to an average annual growth rate of 38.2% -- and represented three quarters (74.4%) of China’s wastepaper imports in 2006.

*Wastepaper Market Prices:* Prices in wastepaper markets, both domestic and international, have traditionally been very cyclical, following the international pulp price cycle, but with increased amplitude. As a result the trade was badly organized in relation to marginal material with collectors and dealers moving in when prices were high, and out when prices fell at which time marginal resources went to landfill.

Taking the volume perspective back another five years, a decade ago the world trade in wastepaper was 17.7 Mt of which exports from the USA constituted 5.8 Mt. In 2006, world exports to China alone rose to 19.6 Mt with the USA providing 8.6 Mt – 2.8 Mt more than its entire wastepaper trade a decade previously. China’s imports of wastepaper have increased by a massive 16.5 Mtpa over the last decade, from 3.1 Mt in 1996 to 19.6 Mt in 2006. The sheer volume of this trade has had a very beneficial effect on the world market. China’s demand has been instrumental, not only in bringing stability to the market price-wise, but it has also succeeded in lifting those prices substantially. Between 2002 and 2005, for example, the average price of wastepaper imported into China increased 35% (prices fell slightly in 2006). Between 2002 and 2006, however the average annual rate of price increase for all grades was still 7% per year.

The constant demand from China and the very strong pricing environment it has created has led to substantial investment in collection and processing facilities around the world, which have tackled previously marginal or uneconomic waste streams and boosted the profile of the trade in many of the countries from which it draws supplies. As such, it has been instrumental in keeping vast amounts of wastepaper out of landfills, an enormous environmental plus for the supplying countries.

## **Wastepaper’s Environmental Impacts**

*Impact on Paper to Landfill:* In 1996, the wastepaper trade with China was only 3.1 Mt per year. The five preceding years had averaged only 2.3 Mt per year. Assuming China had not entered a period of rapid economic development and that it continued to import at the rate of 2.3 Mt per year between 1996 and 2006, the total wastepaper inflow would have been only 23 Mt. Instead, China imported 87.6 Mt in those ten years. It can thus be said that, in the absence of China’s dramatic expansion in demand for wastepaper, an extra 65 Mt of wastepaper would have ended up in landfills around the world (but mainly in the US, Europe and Japan) during those ten years.

*Wastepaper Imports’ Impact on the World’s Forests:* The following table sets out an assessment of the extent to which China’s involvement in the wastepaper trade has resulted in a reduction in the world wood harvest below what might have been the case had virgin materials been used for all its wood fiber needs. Table 1 sets out China’s imports of wastepaper by grade, the approximate conversion factor for each grade from green wood and the resulting log harvest that would have been necessary to supply that fiber from the world’s forests.

**Table 1: Wood Equivalent of China's Wastepaper Trade: 2006 (Mgmt)**

Grade	Tonnage (Mt)	Conversion Factor	Green Wood Equivalent
Unbleached Kraft	10.4	3.2	33.4
Bleached Chemical	0.2	4.5	1.0
Mechanical Pulp	5.0	2	10.0
Other	4.0	2.5	9.9
Total WP Imports	19.6		54.3

Source: WTA & BS&A estimates. Note: Mgmt = Millions of green metric tonnes.

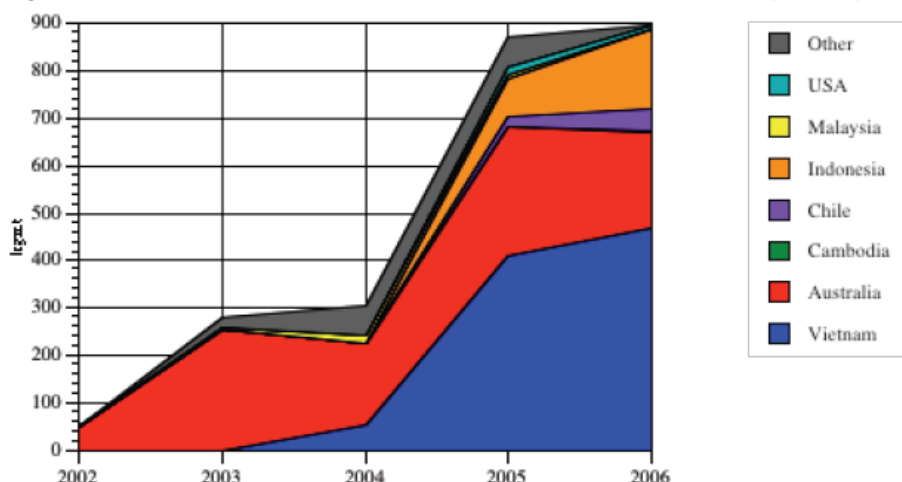
This estimate will err by the extent that fiber is on a second or subsequent time around the cycle. There is debate about how many times, for example, strong softwood fibers could effectively be re-used before breaking down, but it is unlikely to be much more than twice. Also, the majority of wastepaper exports from the USA (44% of China's imports in 2006), for example, is likely to be on their first time around. Nevertheless, assuming that a large number of Chinese export cardboard cartons are now flowing back to China and only half of the total fiber flow is regarded as utilized in lieu of new wood, then the figure, at 27.2 Mgmt, is still very significant. It should be borne in mind that this figure is for a single year (2006).

### Imports of Virgin Pulp and Pulpwood - The Reputational Risk to Chinese Paper Industry

Despite the environmental benefits of China's wastepaper utilization, notably the imports of virgin fiber supplies such as pulp and pulpwood sourced from Russia and Indonesia, which while not constituting a large proportion of China's papermaking fiber supply, should be considered high risk as these sources are likely coming from natural forests with little guarantee of sustainable let along legal management and production. The proportion of imported pulpwood makes of China's total papermaking fibre supply (at less than 1%) is very small, but it has the potential to expand rapidly with deleterious environmental effects.

Most of the hardwood pulpwood supply, harvested from either Vietnam's eucalypt plantations (52% in 2006) or sustainably managed forests in Australia (23%), does not indicate a significant negative impact. However, a minor (19%), but rapidly growing proportion is, however, being sourced from Indonesia (Fig. 3). There is no way of knowing whether this is plantation or natural forest material. In the past Indonesian companies have added very large tranches to pulping capacity without an adequate wood supply and this could happen in future, leading to a vastly increased wood flow emanating from non-sustainable sources in Indonesia.

**Figure 3: China's Imports of Hardwood Pulpwood: 2002-2006 (kdbmt)**



Source: World Trade Atlas

China's sources of bleached kraft pulp are quite diverse with six countries having quite significant market shares. It is the countries of origin that provide an indication of the likely environmental sustainability of wood resource that underpins this massive fibre flow. Not all sources of supply have been examined, but of the 6.4 Mt of bleached kraft pulp imported by China in 2006, it seems likely that at least 3.7 Mt, or 58%, was drawn from sustainably managed forest bases because they were sourced from countries deemed to have effective regulatory and enforcement systems (e.g. Canada, Brazil where the bleached kraft pulpmills source from plantations, the USA and Finland). On the other hand, some doubt must be expressed in relation to the almost one third (32.1%) sourced from Russia and Indonesia in that year – two countries with known forest governance problems and high reports rates of illegal logging. In Indonesia, mixed tropical hardwood is understood to still constitute a large proportion of the wood supply to the country's bleached kraft pulp mills. Russia was the fourth largest supplier with 882 kt in 2006 and some doubt must be expressed as to the environmental sustainability of the management of its vast forest base.

In addition, the activities of two companies stand out and have been the subject to intense international scrutiny on environmental (as well as financial) grounds: Asia Pulp and Paper (APP) and Asia Pacific Resources International (APRIL). Both companies have established pulp mills in China well in advance of the availability of an adequate local plantation wood supply. To overcome this problem, they appear to have begun shipping both pulp and pulpwood from Indonesia to pulp mills and paper machines in China. Considerable doubt has been expressed as to the extent that the plantations established to support these Indonesian pulp mills are presently adequate or are likely to be adequate at any time in the near future. Again, it is not known whether this pulpwood is plantation sourced or whether it has been purchased from contractors who have obtained it illegally.

### Summary and Recommendations:

The sheer volume of China's demand for wastepaper has been instrumental, not only in bringing stability to the wastepaper market price-wise, but lifting those prices and thus incentives to invest in collection and processing facilities around the world. China has therefore been instrumental in keeping vast amounts of wastepaper out of landfill worldwide -- approximately 65 million tons (Mt) of wastepaper over the past decade. This wastepaper would have replaced 27.2 million green metric tones of wood in 2006 alone.

Some of China's other fiber sources, however, such as pulp and pulpwood sourced from Russia and Indonesia, which while not constituting a large proportion of China's papermaking fiber supply, should be considered high risk as these sources are likely coming from natural forests with little guarantee of sustainable let along legal management and production. In order to help safeguard the reputation of China's paper industry, government and industry leaders should:

- ensure that all imported pulp is certified as to the sustainability of the wood supply from which it was manufactured, and
- that all pulpwood imported be similarly certified that it was harvested from sustainably managed forests.

*This Information Bulletin was adapted from a report entitled "Environmental Aspects of China's Papermaking Fiber Supply," written by Brian Stafford of Brian Stafford & Associates for Forest Trends. The China – East Asia Information Bulletin is produced by Forest Trends as part of a joint program with the Rights and Resources Group, entitled "China and East Asia: Transforming Policy and Trade for Forests and Livelihoods." The series is edited by Kerstin Canby, Director of Forest Trade and Finance, Forest Trends ([kcanby@forest-trends.org](mailto:kcanby@forest-trends.org)); all issues can be found at [www.forest-trends.org](http://www.forest-trends.org).*