

## Sustainable Use of Recycled Fiber

This brief is provided to offer guidance to our customers and other stakeholders looking for information regarding the benefits of recycling paper and the responsible use of recycled fiber. The information can be used to help make informed decisions when buying paper and in developing policies or statements to help promote recycling.

It is important to encourage recycling and keep paper out of landfills. Once paper has been recovered, it is equally important to put the fiber to its best use—in the right locations and the right grades based on evaluating economic and environmental consequences. Ultimately, recycled fiber should be used in products where it displaces a higher manufacturing footprint.

The information presented is based on Sappi's knowledge and expertise and is supported by documents included in the reference section.

### Table of Contents

1. Overview . . . . .	1
2. Responsible use of recovered paper. . . . .	2
3. Life cycle thinking . . . . .	2
4. Environmental impact of recycling. . . . .	2
5. A sustainable fiber cycle . . . . .	3
6. Please recycle . . . . .	3
7. References . . . . .	4

### ①

### Overview

One of the key environmental attributes of paper is that it can be easily recycled and used to make new products. In fact, paper is the most recycled material in the world today, with recovery rates ranging from 60 to 75% in North America and Western Europe (1). Over the next 15 years, recovered paper is expected to grow from 43% to 61% of total global fiber supplies (1).

The key environmental benefits of recycling paper products are: 1) the avoidance of landfill space use, and longer life of landfill sites, and 2) the avoidance of paper degradation in landfills and the resulting release of methane during that process (methane is a powerful greenhouse gas and contributes to climate change).

In the papermaking process, wood fiber can be recycled an estimated 4 to 7 times, after which the fiber breaks down and can no longer be used to make paper. In other words, recovered paper is not an infinite source of raw material. To make the global fiber cycle work, a continual input of 35 to 65% of fresh wood fiber is needed depending on the grade of paper manufactured. If no wood fiber were used then degradation through recycling would result in the world running out of paper within a period 6 to 18 months depending on the paper grade (2).

Virgin wood fiber and recovered paper complement each other as key raw materials for paper and board manufacturing.

## ②

### Responsible use of recovered paper

Today, most recovered paper is used as a raw material in packaging grades such as carton board and paper board because the manufacture of these grades does not typically involve deinking and/or bleaching (1). Therefore, the processing is generally less costly and may also have less environmental impacts than when deinking and bleaching are required.

Over 90% of recovered paper in the world is used in grades other than printing and writing grades, such as newsprint, tissue, container boards, and other packaging or board products. Approximately 6% of the global recovered paper supply is used in printing and writing grades, and this percentage is forecasted to increase only slightly by 2025. Most of the forecasted increase is in container boards, carton boards and tissue paper (1).

The distance between the recovered fiber source (usually areas of large population density) and the mill site is a key factor to consider when using recovered paper as a raw material. It is typically more economical to have short transportation distances to make the paper life cycle more efficient from an economic point of view, but also to minimize the carbon footprint of transporting raw materials.

In graphics applications, customers often require paper with good printing qualities and paper that will run well, without breaking, on high-speed printing presses. These quality requirements often require the use of fresh wood fiber as a raw material, instead of deinked pulp from recovered paper. Sheet strength and printing quality can vary tremendously depending on the type and quality of deinked pulp used. Furthermore, poor runability on press can lead to higher waste generation.

Clearly, the act of recycling paper is beneficial for the environment, but the responsible use of recovered paper as a raw material to make new products should take into account economic and environmental consequences. Sustainable use of recycled fiber means using it in the right locations and in the right paper grades. As a guideline, the United States Environmental Protection Agency (U.S. EPA) has recommended significantly different levels of total recovered fiber in certain paper grades, ranging from 10% for printing and writing grades to 100% for newsprint and packaging grades (3).

## ③

### Life cycle thinking

The environmental footprint of paper should be assessed on key indicators over the life cycle of the product. Life cycle inventories (LCI) or life cycle assessments (LCA) are sometimes conducted to compare products and end uses (4,5,6,7,8,9). Product scorecards or environmental product declarations, such as the ones outlined below, are also used:

- Environmental Paper Assessment Tool (EPAT) (10)
- Paper Profile (11)
- Proctor & Gamble, Sustainability Scorecard (12)
- World Wildlife Federation (WWF) Paper Scorecard (13)

These scorecards or life cycle studies assess product performance across a wide range of indicators such as:

- Percentage of certified fiber from sustainably managed forests
- Water and energy use
- Emissions to air and water
- Solid waste to landfill
- Carbon footprint

When such evaluations are done, it becomes apparent that the type of fiber alone does not explain key aspects of environmental performance since it does not take account of other raw materials, production impacts, logistics and chemicals used, for example. Environmental impacts are site-specific and vary from one facility to the next and from one company to the next.

## ④

### Environmental impact of recycling

The use of recycled fiber does not universally lower the overall environmental footprint of paper products. One must consider the type of product and the processing required for using recycled fiber.

Recycling typically uses less energy than raw material pulping. However the production of recycled fiber still consumes energy, much of which is based on fossil fuels. When looking at emissions data for virgin pulp made at integrated kraft mills (freesheet mills), the carbon footprint of virgin fiber can be significantly lower because kraft mills have high levels of renewable energy. Therefore it is important for buyers to consider what type of fiber is being displaced and how that fiber was manufactured when recycled fiber is used. Ultimately, recycled fiber should be used in products where it displaces a higher manufacturing footprint. For this reason, paper buyers are encouraged to ask their suppliers for mill-specific data regarding emissions from fossil fuels as well as emissions associated with purchased electricity.



The figure above illustrates the tradeoffs associated with using recycled fiber in different products. Generally speaking, for products higher on the “quality pyramid” there is more processing required for using recycled fiber. For example, to use fiber in coated graphics applications the fiber must be deinked and bleached, which requires high levels of electrical energy as well as bleaching chemicals and results in a lower yield (more waste). On the other hand, recycled fiber can be used in applications like egg cartons, paper board packaging (e.g., cereal boxes) or paper towels typically without requiring deinking or bleaching—a better use for recycled fiber.

## ⑤

### A sustainable fiber cycle

Sustainably managed forest and recovered paper are expected to continue to be the main sources of raw material for paper and paperboard manufacture. Global consumption of certain wood-based pulps and recovered paper-based pulp is expected to increase over the next 15 years (1). Therefore, more paper recovery is needed in many regions of the globe, as well as more sustainable forest management. It is not a question of recycled fiber versus wood fiber, it is a question of a balance of both.

A procurement policy that preferentially targets recycled fiber paper over wood fiber may narrow the available sources and choice of paper, and exclude paper with sound environmental credentials. Some recycled grades may have a higher environmental load than wood-based grades for key indicators such as waste, water, energy and carbon footprint.

## ⑥

### Please recycle

There is a view that product stewardship covers the whole life cycle of a product, including its disposal. Therefore, more companies are actively engaged in minimizing the environmental impacts of their products once they leave their manufacturing facilities.

In fact, life cycle analysis has shown that the end of life (how a product is disposed of) contributes nearly as much to the carbon footprint of a product as the manufacturing process (4). For customers concerned about reducing their greenhouse gas emissions, it is important to select the manufacturer with the lowest footprint and then promote recycling to help reduce emissions associated with landfills.

One way to promote recycling is to use currently available “Please Recycle” logos and claims, and to get engaged in recycling initiatives with end users, cities and communities (14,15,16,17).



The logos shown above were created by industry trade associations specifically to help promote recovery of printing and writing grades. While the Direct Marketing Association’s “blue bin” logo is restricted to membership use only (17), the “Please Recycle This Magazine” logo is offered to anyone who chooses to use it (16).

Promoting the recycling of paper and print products is a great way to demonstrate product stewardship and help close the loop on the life cycle of paper.

## References

1. Jaakko Poyry. 2009. World Fiber Outlook up to 2025, 2009 edition, Volume 1, Executive Report (Confidential).
2. The Fiber Cycle Technical Document. Metafore Summary Report, March 2006. 14 p.
3. U.S. EPA, 2007. Comprehensive Procurement Guidelines. Buy Recycled Series – Paper Products. EPA530-F-07-039, www.epa.gov/osw, October 2007.
4. National Council for Air and Stream Improvement (NCASI). 2010. Life cycle assessment of North American printing and writing paper products. Final report prepared for American Forest and Paper Association (AF&PA), Forest Products Association of Canada (FPAC). June 18, 2010. 292 p.
5. ISO standards for life cycle assessment to promote sustainable development, www.iso.org/iso/pressrelease.htm?refid=Ref1019
6. LCA Graphic Paper and Print Products (Part 1). 1998. Proposal for a new forestry assessment method in LCA - Long version of the study. An environmental project of Axel Springer Verlag AG, Stora, Canfor. Scientific Consultant INFRAS, Zurich. 146 p.
7. LCA Graphic Paper and Print Products (Part 2). 1998. Report on industrial process assessment - Long version of the study. An environmental project of Axel Springer Verlag AG, Stora, Canfor. Scientific Consultant INFRAS, Zurich. 49 p.
8. Salazar, E. et al. 2006. Identifying Environmental Improvement Opportunities for Newsprint Production Using Life Cycle Assessment (LCA). Pulp and Paper Canada, Vol. 107, No. 11. pp. 32-38.
9. Paper Task Force (Duke University, Environmental Defence Fund, Johnson & Johnson, McDonald's, The Prudential Insurance Company of America, Time Inc.). 1995. White Paper No. 3 – Lifecycle environmental comparisons: virgin paper and recycled paper-based systems. Data in Sections II and IV and Appendices C and D Updated in February 2002. 165 p.
10. Metafore, Metafore Downloadable Documents, Metafore Paper Working Group and EPAT Documents, www.metafore.org/index.php?p=Metafore\_Downloadable\_Documents&s=567)
11. Manual for an environmental product declaration for the pulp and paper industry – Paper Profile, Valid from January 2008. www.paperprofile.com/
12. Procter & Gamble, Supplier Sustainability Scorecard. www.pgsupplier.com/supplier-environmental-sustainability-scorecard
13. The WWF Guide to Buying Paper, WWF International 2007. http://wwf.panda.org/how\_you\_can\_help/greenliving/at\_the\_office/reducing\_paper/paper\_toolbox/tools\_for\_paper\_buyers/the\_wwf\_guide\_to\_buying\_paper
14. Paperrecycles.org, www.paperrecycles.org
15. American Paper & Forest Association (AF&PA), www.afandpa.org
16. Magazine Publisher Association (MPA) recycling program. www.magazine.org/environment/21345.aspx
17. Direct Marketing Association (DMA) recycling initiative. www.dmaresponsibility.org/Recycle/

If you print this document, please pass it onto a friend or recycle it.

© 2011 Sappi Fine Paper North America. All Rights Reserved.

All web links validated as of April 4, 2011.

**We invite you to share your thoughts so that we can all benefit from innovative thinking and best practices. For questions and comments on this document, please email us at [eQ@sappi.com](mailto:eQ@sappi.com).**