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Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

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# Buying and Using Recycled Paper

## The Importance of Buying Recycled

Buying recycled products is critically important to the success of recycling programs in New Hampshire and nationwide. It is straightforward for a community to set up a recycling program and start collecting recyclables from the waste stream. However, if there are no buyers -- no markets -- for those materials, they will accumulate excessively at local transfer stations, degrade from exposure to light and moisture, and eventually will require disposal at a landfill or incinerator. The key to establishing markets for recycled materials is consumer demand -- the decision, by millions of individual consumers, to seek out and purchase products with recycled content. Quite simply, if you're not buying recycled, you're not recycling.

This is particularly true for paper. For many materials (aluminum, for example) markets for recycled raw materials are well established, and the economics of production drive manufacturers to consume as much recycled raw material as they can find. It is also impossible to distinguish between a "recycled" steel can (for example), and a can made from virgin steel -- the products are virtually the same. For paper, however, recycled products compete with similar products manufactured from virgin materials, and consumers have choices about the recycled content of products they purchase. Consumers also have the ability to influence manufacturers' decisions about using recycled paper by expressing their preference for newspapers, books, magazines, paper towels, and other products with recycled content. For all types of paper, buying and using recycled paper is the key to successful recycling.

## Manufacturing Pulp and Paper

*Pulp - and Papermaking* -- To understand recycled papers, one must understand how paper is made. Paper is manufactured in two distinct operations: pulpmaking and papermaking. The raw material for pulpmaking is a fiber source: whole trees or recycled paper (or, very rarely, sawdust, rags, rice, or another fibrous material). Pulp mills physically and chemically break these materials down into a watery slurry of fibers and dissolved chemicals. This slurry (pulp) is the end product of pulpmaking, and the raw material for papermaking. Pulp may be directly used in an attached paper machine or sold to papermakers in regional or national markets. To manufacture paper, pulp is spread onto rollers at the "head end" of a paper machine. It is then carried through a series of screens and more rollers where it dries to become a finished paper.

*Recycled Pulp* -- To produce a recycled pulp, waste paper is dumped into a large mixing vat ("pulper") containing a solution of chemicals that loosen the bonds between paper fibers and begin to remove inks. Different papers are mixed to produce pulps with specific characteristics. Contaminants (rubber bands, staples, etc.) are removed by gravity or filtration, and (if necessary)

the pulp is de-inked and/or bleached. De-inking of printed papers is accomplished by washing or "flotation". Washing uses chemicals and mixing action to lift ink particles and other coatings from the paper fibers, while floatation employs a bath of small air bubbles to separate coatings from fibers. Floatation is effective in removing the toners on laser printed and xerox copies. These papers are difficult to de-ink by washing and therefore had little value in recycled fiber markets before floatation technologies were developed. Once washed and de-inked, recycled pulp is handled exactly like virgin pulp.

*Virgin Pulp* -- By contrast, virgin pulp mills start with whole trees, and uses one of two processes -- chemical or groundwood pulping -- to produce pulp. In a chemical pulp mill, trees are shredded into small (about 2-inch) chips which are heated under pressure in a solution that dissolves the natural chemical glues that hold the wood fibers together ("lignin," "hemicellulose," and other compounds). The chip mixture is released explosively from the pressure vessel, and the chips dissolve into a slurry of wood fibers, pulping chemicals, and liquified natural wood chemicals. The slurry is washed to remove the pulping chemicals (which are recycled and reused) and most of the natural liquids. The remaining solution is frequently bleached to increase brightness and destroy remaining organic compounds (which reduce paper quality). The fiber slurry, now a finished pulp, is either dried for sale to paper manufacturers, or pumped directly to a paper machine.

The groundwood process (which produces newsprint, directory stock, and similar papers) is quite different. Whole trees are moistened and mechanically ground up by large rollers, releasing the fibers into a water-based slurry with most of the wood chemicals (lignins and others) still intact. After washing and bleaching, this slurry is pumped directly to a paper machine. Most of the chemical constituents of wood are carried into the final paper product along with the wood fibers, where they tend to reduce strength and durability -- this is a distinguishing characteristics of groundwood papers.

*Papermaking from Recycled and Virgin Pulps* -- Much of the "art" of papermaking consist of blending pulps to produce papers with specific characteristics. Among the many sources of variation in pulps are: hardwood vs. softwood fiber sources; the nature and severity of pulping and bleaching processes; and the nature and proportions of recycled fibers that are incorporated. The paper industry has used recycled fiber since its earliest days. Recycled and virgin pulps can be mixed in wide proportions to manufacture recycled papers. By the mid-1980s, before the proliferation of municipal recycling programs, recycled fiber already accounted for about a quarter of the papermaking feedstock in the U.S.

Historically, most recycled paper has been used in lower-quality papers, including, for example, tissues, boxboard (e.g., cereal boxes), gypsum wallboard facing, thick-walled tubing, and pressed pulp products (e.g., egg cartons). Within the past ten years, however, a number of forces have combined to increase the use of recycled fiber in all paper grades -- these have included technical developments in pulping, de-inking, and papermaking processes, increasing public and regulatory pressure concerning the environmental impacts of virgin pulp operations, increasing low-cost supplies of recycled fibers, and increasing demand for recycled fiber content in all papers.

Currently, products with recycled fiber content are available in almost all paper grades. Some papers continue to be produced with high recycled content as a matter of course (paper towels, tissues, boxboard). Manufacturers have begun to advertise the recycled fiber content of such products, and buyers are more aware that they are purchasing a "recycled" paper. In many other grades, however, recycled papers compete with products manufactured form virgin pulps. In most writing, copying, and printing grades, recycled content paper are now widely available,

giving consumers and businesses a variety of options to "buy recycled." While there are few or no differences in the performance of virgin and recycled content papers in most applications (e.g., laser printers, letterhead, magazine stock), some consumers and business purchasers harbor lingering apprehension about the performance or quality of recycled papers. Recycled paper prices are comparable to virgin paper grades.

*Energy Use and Environmental Releases* -- The majority of environmental releases in the pulp and paper industry come from pulping. The environmental impacts of papermaking are much smaller, and it is impossible to distinguish between the impacts from virgin and recycled papermaking. In pulpmaking, however, the differences are large. Compared to virgin pulping, recycled pulping consumes much less energy and generates smaller releases to air, water, and solid and hazardous waste streams. Virgin pulp mills recycle and reuse most pulping and bleaching chemicals, and use many process wastes in-house (for example, they burn bark, wood scraps, and wood chemicals to produce steam and electricity). Nonetheless, the sheer scale of pulpmaking operations, and the harsh nature of many pulping and bleaching processes, makes them the source of significant impacts to all environmental media. Recycled pulp operations, on the other hand, bypass the most energy-intensive and environmentally harsh steps in the pulpmaking process, and so are able to produce pulp at a smaller energy-use and environmental cost. The processes used in recycled pulping operations -- washing and deinking -- use relatively benign chemicals, and are not the source of major environmental impacts.

**Buying and Using Recycled Paper**

*"Pre-Consumer" vs "Post-Consumer" Recycled Fiber* -- This can be a critical distinction in the definition of recycled paper. "Post-consumer" fiber is derived from products that have been purchased and used by their ultimate consumers (individuals and businesses) and recycled through municipal or private sector recycling programs. For most of the public, this is the accepted definition of "recycled." "Pre-consumer" fiber is mill or processing scrap that has been captured during a production process (e.g., papermaking, envelope production, printing) and has never been part of a finished product.

Many pre-consumer wastes have been recycled for decades. Because this was part of their normal production, manufactures did not claim credit for recycling these wastes. But recently, as demand for "recycled content" has grown, many producers have claimed pre-consumer waste as recycled fiber, and have marketed "recycled" products that represent no change from established manufacturing practices. These claims have caused widespread consumer confusion, and in some cases a backlash against firms and industries marketing recycled products. Many states have enacted legislation to manage the use of terms related to recycling. At the national level, the U.S. Environmental Protection Agency and Federal Trade Commission have issued guidelines governing use of these terms. As a result of these state and federal actions, confusion regarding the meaning of recycled content claims is diminishing. For most "recycled" papers, purchasers should be able to obtain accurate information on pre- and post-consumer recycled fiber content, and ascertain that the "recycled" products they purchase do, in fact, include fiber captured from post-consumer wastes.

*Choices for Consumer and Businesses* -- In the paper industry (like most consumer product industries), consumer demand drives the selection of products that manufactures make available. If consumers demand papers with recycled content, manufacturers will produce these papers. Recycled content papers are currently available in almost all paper grades, from high quality writing, printing, and copying stock to file folders, tissues, and paper towels. Consumers can ask suppliers for specific information on the recycled content of papers they purchase (including pre- and post-consumer fiber), and insist on buying only papers with the maximum available recycled

fiber content. (As part of a statewide "Buy Recycled Challenge," described below, the State is developing information on the availability of recycled papers in many paper grades. This information will be made available to businesses and individual consumers to guide their purchases of recycled papers.)

Consumers exercise only indirect control over the recycled fiber content of many papers they purchase. For many of these items, consumers can make their preferences known to manufacturers by writing to express their preference for recycled content papers, or by refraining from purchasing products that do not contain recycled fiber. Many of these paper products are also the subject of state and regional efforts to increase recycled content. Several such initiatives are described below.

*State and Regional Initiatives to Purchase Recycled Papers* -- A number of government initiatives are currently stimulating recycled paper markets. New Hampshire's state government has been committed to purchasing recycled paper since 1989. Under a 1993 law and executive order, all paper purchased by State agencies must include at least 20% post-consumer fiber and beginning December 31, 1998 the minimum percentage will be increased to 30%. In addition, in 1990 the State reached a voluntary agreement with New Hampshire's eight daily newspaper to purchase specified quantities of recycled newsprint, culminating with 40% recycled fiber content by the year 2000. In 1995, the newspapers' average recycled fiber content was over 31%, already exceeding their established biennial target. All of the Northeastern states have implemented similar agreements or equivalent legislation.

A statewide initiative is a public/private "Buy Recycled Challenge". Started in 1994, this campaign challenges businesses, government, and non-profit organizations to make a report on their purchases of recycled products. The campaign emphasizes paper products, but includes a wide array of other recyclables as well. An important part of the campaign is information on the availability and performance of recycled products which are provided to campaign participants (and made available to the general public). New Hampshire's "Buy Recycled Challenge" is similar to a nationwide campaign targeting very large firms that has been orchestrated by the National Recycling Coalition, and to campaigns in many other states.

Regional recycling organizations have also been active in stimulating recycled paper markets. For example, the Northeast Recycling Council (NERC), which represents state recycling agencies in the ten northeastern states, has established an agreement with the Yellow Page Publishers Association to increase the use of recycled fiber (and achieve other source reduction and recycling goals) in telephone and other directories, and an agreement with the Direct Marketing Association to increase the use of recycled papers in catalogues and other direct mail advertising.

For more information, please contact: Recycling Coordinator, Department of Environmental Services, Waste Management Division, P O Box 95, 29 Hazen Dr., Concord, NH 03301, Telephone: (603) 271-2900, TDD Access: Relay NH 1-800-735-2964.