



The State of the Paper Industry

Monitoring the Indicators of Environmental Performance

*A collaborative report by the Steering Committee
of the Environmental Paper Network*

EXECUTIVE SUMMARY

DESPITE PREDICTIONS THAT THE DIGITAL REVOLUTION WOULD MAKE PAPER AS OBSOLETE AS THE TYPEWRITER, PAPER REMAINS CENTRAL TO OUR LIVES. YET MOST OF US, MOST OF THE TIME, GIVE LITTLE THOUGHT TO HOW MUCH WE DEPEND ON PAPER PRODUCTS. THINK OF THE HUNDREDS OF TIMES A DAY WE TOUCH PAPER—NEWSPAPERS, CEREAL BOXES, TOILET PAPER, WATER BOTTLE LABELS, PARKING TICKETS, STREAMS OF CATALOGS AND JUNK MAIL, MONEY, TISSUES, BOOKS, SHOPPING BAGS, RECEIPTS, NAPKINS, PRINTER AND COPIER PAPER AT HOME AND WORK, MAGAZINES, TO-GO FOOD PACKAGING. THE LIST COULD FILL A PAPERBACK.

What's more, few people pay much heed to the ways in which our use of paper affects the environment. Yet the paper industry's activities—and our individual use and disposal of paper in our daily lives—have enormous impacts. These include loss and degradation of forests that moderate climate change, destruction of habitat for countless plant and animal species, pollution of air and water with toxic chemicals such as mercury and dioxin, and production of methane—a potent greenhouse gas—as paper decomposes in landfills, to name just a few.

How can a product that is so interwoven in our lives have such devastating effects? And more to the point, what can we do to avoid, slow, or reverse the harmful consequences of wood harvesting, pulp and paper manufacturing, and paper use and disposal? This report tackles these questions within the framework of *A Common Vision for Transforming the Pulp and Paper Industry*, a call to action first issued in 2002 by the Environmental Paper Network (EPN).



This report represents the Environmental Paper Network's (EPN) effort to identify the most important indicators to use when evaluating the environmental performance of the pulp and paper industry.

The EPN’s members represent a diverse group of non-profit organizations united by their shared interest in supporting socially and environmentally sustainable transformations within the pulp and paper industry. To achieve this transformation, the *Common Vision* defines four key goals: minimize paper consumption, maximize recycled content, source fiber responsibly and employ cleaner production practices.

In each of these four categories, this report identifies key indicators to use in evaluating the environmental performance of the pulp and paper industry. Over time, tracking these environmental performance indicators will allow the paper industry, paper users, the EPN and other stakeholders to measure the industry’s progress toward sustainability.

This report contains a wealth of data about the paper industry’s environmental impacts gathered from business, government and non-governmental sources. While there have been some bright spots in recent years—such as the phasing out in the United States of elemental chlorine to bleach pulp, which reduces the generation of dioxins—in aggregate the environmental performance indicators paint a troubling picture. These indicators help clarify what needs attention, and what role stakeholders might play in moving the industry toward cleaner, healthier, more environmentally responsible production.

PAPER: IT’S CHANGING THE CLIMATE

One of the most significant, and perhaps least understood, impacts of the paper industry is climate change. Every phase of paper’s lifecycle contributes to global warming, from harvesting trees to production of pulp and paper to eventual disposal.

It is estimated that 42% of the industrial wood harvest is used to make paper—a sobering fact given that forests store roughly 50 percent of all terrestrial carbon, making them

one of our most important safeguards against climate change. Old-growth and mature, second-growth natural forests store much larger amounts of carbon than newly planted stands and once logged, require decades to recover the original amount of carbon they contained.

Whether the tree grew in a mature forest or industrial tree plantation, climate change impacts multiply after it is harvested. The pulp and paper industry is the fourth largest emitter of greenhouse gases among manufacturing industries, and contributes 9 percent of total manufacturing carbon dioxide emissions. The biggest greenhouse gas releases in pulp and paper manufacturing come from the energy production needed to power the pulp and paper mill.

The climate change effects of paper carry all the way through to disposal. If paper is landfilled rather than recycled, it decomposes and produces methane, a greenhouse gas with 23 times the heat-trapping power of carbon dioxide. More than one-third of municipal solid waste is paper, and municipal landfills account for 34 percent of human-related methane emissions to the atmosphere, making landfills the single largest source of such emissions. The U.S. Environmental Protection Agency has identified the decomposition of paper as among the most significant sources of landfill methane.

The climate benefits of reducing paper consumption are significant. If, for example, the United States cut its office paper use by roughly 10 percent, or 540,000 tons, greenhouse gas emissions would fall by 1.6 million tons. This is the equivalent of taking 280,000 cars off the road for a year.

By embracing the four pillars of the *Common Vision*—minimizing paper consumption, maximizing recycled content, sourcing fiber responsibly and employing cleaner production practices—paper manufacturers, suppliers and purchasers can dramatically reduce the climate change impacts of the paper industry.

RECYCLED CONTENT: STEPPING UP TO MEET DEMAND

Reducing paper consumption is an important first step in reducing the environmental impacts of the paper industry. The next step is to ensure that all paper is environmentally sustainable—and that starts with recycled content. Replacing virgin tree fibers with recovered fibers reduces demand for wood, which eases pressure to harvest forests and convert natural forests into tree plantations. Making paper from used paper requires less energy and is generally a cleaner manufacturing process than making paper from trees. And because it diverts usable paper from the waste stream, recycling cuts both solid waste and greenhouse gas emissions created when paper decomposes in landfills.

Benefits of Recycled Paper

Compared to copy paper made from 100% virgin forest fiber, a copy paper made from 100% recycled content reduces:

- total energy consumption by 44%
- net greenhouse gas emissions by 38%
- particulate emissions by 41%
- wastewater by 50%
- solid waste by 49%
- wood use by 100%

Source: Environmental Defense Paper Calculator.

With curbside recycling programs common across the United States, many people assume that the paper recycling industry is thriving. The truth is much more complex.

Currently, 37 percent of U.S. pulp and nearly 25 percent of Canadian pulp is produced from recovered paper. However, the use of recycled content varies widely among grades of paper, from an average of 45 percent recycled content in tissue products and 32 percent in newsprint to a low of 6 percent in printing and writing papers.

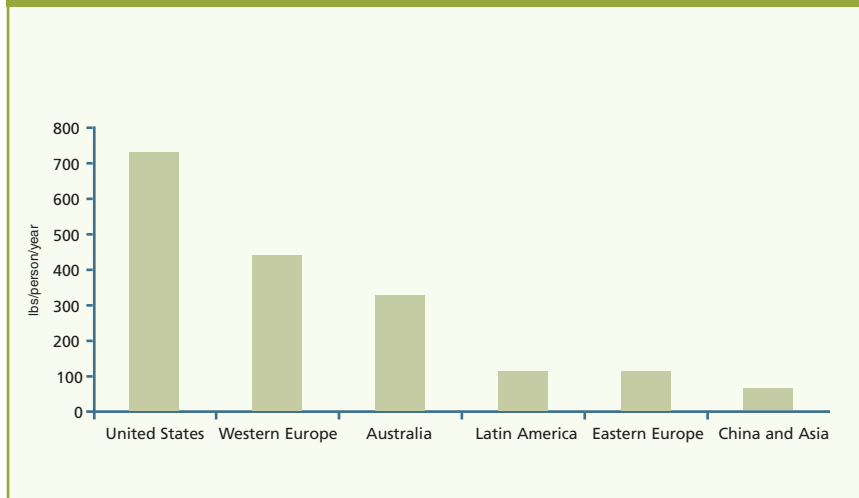
Estimates by environmental groups and paper industry pulp producers suggest that as much as 1.5 million additional tons of recycled pulp per year is needed to meet projected new demand for recycled paper in the United States within the next five to ten years. But as demand increases, will there be enough supply? One encouraging trend is that paper recovery has increased every year over the past five years and in 2006 exceeded 53 percent. However, the United States is nowhere close to tapping out the domestic supply of used paper suitable for recycled pulp: in 2003, only 48.3 percent of office paper was recovered for recycling. The key constraints to the availability of recycled paper in the United States are: 1) deinking or recycling capacity, 2) demand for recovered paper from abroad, 3) degradation of recovered paper quality that makes it unsuitable for use in particular grades of recycled papers, and 4) our ability to recover more paper from the waste stream.

Current trends, including an increased reliance on single-stream recycling programs that mix bottles, cans and other material with paper, may ultimately undermine the North American paper recycling system. Unless there is a functional recycling infrastructure, all papers will wind up landfilled or incinerated, wasting their reuse potential. The best way to ensure that the whole recycling system will function optimally is for North American paper purchasers to require recycled content in paper; that demand pulls used paper through the system to be used again.

AS GLOBAL CONSUMPTION AND PRODUCTION BOOM, MUST THE ENVIRONMENT PAY THE PRICE?

Paper is now a global industry, with multinational suppliers managing a complex web of fiber sourcing, pulping, paper production and converting operations all over the world. The United States and Western Europe remain by far the biggest paper consumers per capita, but paper

World paper and paper board consumption, per capita, 2004



Source: RISI 2005.

consumption has been growing most rapidly in China and India, in parallel with their expanding economies.

To meet growing demand for paper products, the pulp and paper industry is expanding its production capacity, primarily in developing countries with lower raw material and labor costs and looser environmental regulations. Increasingly, the largest consumers of paper products are exporting the environmental consequences of production, such as damage to forests and discharges of pollutants from paper mills. And while new paper mills making newsprint and packaging in developing countries are incorporating high amounts of recycled fiber, there are virtually no recycled printing and writing mills being built.

SUSTAINABLE FORESTRY:

ACTING BEFORE IT'S TOO LATE

Roughly half the world's forests have been burned or cleared and converted to non-forest uses. Human activity has degraded almost 80 percent of what remains of the planet's once vast forests. These forests have lost, to varying degrees, many of their species and much of their ability to function as healthy ecosystems. Yet many of the remaining forests—including old-growth and other ecologically important forests—are still being logged for the paper industry using unsustainable forest management practices.

To prevent further destruction, the paper industry must adopt more environmentally and socially responsible alternatives for sourcing fiber consistent with the *Common Vision's* goals. A necessary first step is to end the use of wood fiber that threatens endangered forests and other high conservation value ecosystems. As this report points out, considerable work needs to be done to map and monitor these regions and to

Indicators Monitored in this Report

Minimizing Paper Consumption

- Global paper and paperboard consumption, by country and region
- Global paper and paperboard consumption, by grade
- Per capita paper and paperboard consumption
- United States paper consumption by grade
- U.S. printing & writing paper consumption, by end use

Maximizing Recycled Content

- Percentage of pulp made from recovered fiber
- North American high grade deinking capacity
- Recycled content in papers and paper products, by sector and grades within sector
- Percentage of recycled content in printing & writing paper
- Consistent minimum content recycled fiber specifications and standards
- Range of recycled paper choices available in each grade
- Volume of paper in the U.S. municipal solid waste stream
- Recovery rates by grade of paper
- Recovery rate for office papers
- Percentage of recovered high grade papers directed to “highest and best use” such as printing & writing paper
- Percentage of mixed paper in recovered paper collections vs. sorted papers
- U.S. exports of recovered paper
- Recycling capacity in developing nations

Sourcing Fiber Responsibly

- Monitoring Endangered and High Conservation Value Forests
- Stakeholder engagement and agreements
- Protection of Endangered Forests and High Conservation Value Forests
- Forest Stewardship Council (FSC) certification

- FSC certified paper products reaching consumers
- Rate of conversion of forests to plantations
- Percentage of plantation area certified by FSC
- Number of corporate commitments to avoid conversion of forests
- Use of herbicides on tree plantations
- Use of synthetic fertilizers on tree plantations
- Outdoor field trials of genetically engineered trees
- North American availability of non-wood plant fiber for pulp and paper
- Global availability of non-wood plant fiber for pulp and paper
- Leading non-wood fibers in papermaking
- North American pulping capacity for non-wood plant fibers
- World pulping capacities for non-wood fiber

Employing Cleaner Production Practices

- Wood use
- Water use
- Energy use
- Calcium carbonate use
- Greenhouse gases
- Sulfur dioxide
- Nitrogen oxides
- Particulate matter
- Hazardous air pollutants
- Volatile organic compounds
- Total reduced sulfur
- Mercury
- Biochemical oxygen demand
- Chemical oxygen demand
- Total suspended solids
- Adsorbable organic halogens
- Dioxins and dioxin-like compounds
- Total nitrogen and total phosphorus
- Solid waste
- Effluent flow
- Bleaching processes used for all bleached pulp

develop long-lasting conservation agreements.

Independent, third-party certification of forestry management operations plays an indispensable role in helping protect endangered and high conservation value forests. Although a number of certification schemes exist

worldwide, Forest Stewardship Council (FSC) certification is the most widely recognized as having the most credible standards for responsible forestry management. FSC certification is growing rapidly, and in 2006, FSC’s market share of paper products increased globally by 50 percent.

Currently, more than 226 million acres of forests are FSC certified globally. As this report explains, strengthening demand for FSC certified content in paper products promises to accrue numerous benefits to the environment, including a decline in conversion of natural forests to plantations and a reduction in use of polluting herbicides and fertilizers on tree plantations.

WHAT'S NEXT?

This report creates a common vocabulary and set of priorities for EPN's discussions with the paper industry, other nongovernmental organizations (NGOs), corpo-

rate purchasers, government agencies and the public. Because the environmental impacts of paper production vary significantly by grade and region, we have not attempted to establish specific performance goals for paper suppliers. Instead, our hope is that people will use the arguments and data put forth here to inform their own campaigns, purchasing decisions and manufacturing practices and to focus on solutions that advance social and environmental sustainability. In doing so, and by monitoring the environmental performance indicators established by this report, genuine progress towards the *Common Vision* can be achieved.



The Steering Committee of the Environmental Paper Network is the Borealis Centre for Environmental and Trade Research, Conservatree, Co-op America, Green Press Initiative, Dogwood Alliance, ForestEthics, Environmental Defense, Markets Initiative, and the National Wildlife Federation.

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