Green & America

Green in All Grades

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A Green America White Paper
July 23, 2012

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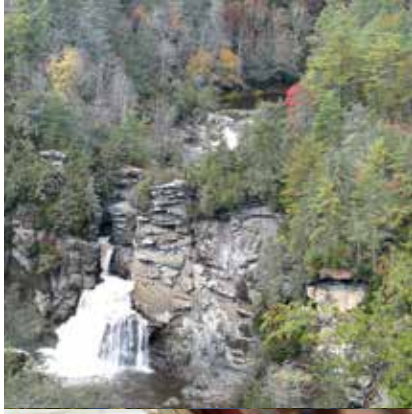



PREFACE: WHO IS THIS "GREEN PAPER" FOR?

Paper buyers, sustainability directors, marketing and public relations personnel, and companies that rely on paper will benefit from the clear explanation for why choosing recycled paper is an environmentally wise decision.

BUT DON'T I ALREADY KNOW THAT RECYCLED PAPER IS A WISE ENVIRONMENTAL CHOICE?

Yes, you do. For decades, everyone believed that using recycled paper was better for the environment than using virgin-tree-fiber paper. Nothing has changed—that is still true. Yet in the last few years, some in the paper industry have been trying to sow confusion about these clear facts through nuanced marketing campaigns. They have claimed that virgin-fiber paper is just as good or better for the environment than recycled paper - specifically when it comes to magazines and other types of printing-writing paper (including copy paper, stationary, and office paper). Our *Green in All Grades* paper "unpacks" the misinformation in these "greenwashing" messages.

HOW WILL THIS *GREEN IN ALL GRADES* HELP ME?

Green in All Grades provides accurate information to support your company's decision to use recycled paper, and it explains how some people and companies try to minimize recycled paper's environmental benefits.

INTRODUCTION: SPITBALLS AND RECYCLED PAPER

WHY EVERY SEVENTH GRADER KNOWS RECYCLED PAPER IS BETTER FOR THE ENVIRONMENT

Seventh graders are infamous for chewing paper into a pulpy state before launching a nefarious air assault. However, these kids would never think of making a spitball by chewing on a tree log—it takes way too much energy and could require mixing some hazardous chemicals with their saliva. This analogy, though perhaps a tad juvenile and simplistic, helps to illustrate how making a new sheet of paper from collected waste paper uses less energy (jaw muscles) and water (saliva), requires fewer tree parts, and is better for the environment than making paper exclusively from trees.

Credible science backs up the spit-balling, environmentally intuitive seventh grader. The seminal *Paper Task Force Report* (PTFR) was written by the Environmental Defense Fund, Time Inc., Duke University, Johnson & Johnson, Prudential Life, and McDonald's. Hardly the product of radical organizations, a glimpse of what the PTFR found includes the following facts:

- Over the full lifecycle of paper products, recycling provides extensive, clear, and measurable environmental advantages compared to virgin-fiber systems.
- Most grades of recycled paper perform comparably to virgin paper, meet functional needs, and are widely available.
- Recycling offers a powerful but not widely recognized means for paper purchasers, acting in the aggregate, to increase supply and reduce prices for new paper products over the medium term by changing the dynamics of the market.[1]

CLEARING UP CONFUSION

Despite the broad stakeholder participation in and scientific rigor of the *Paper Task Force Report*, the debate continues, driven mainly by a small number of companies that represent a very large portion

of the paper production market—a portion that has little or no capability to manufacture recycled paper in a cost-effective manner.

This small but influential group of industry insiders has three main arguments against using recycled paper:

1) "All collected wastepaper is being used—we have a 'scarcity' of recovered paper";

2) "Recycled paper production requires more fossil fuel than virgin-fiber paper"; and,

3) "It takes more chemicals to process recovered paper into a clean, white printing-writing paper than into an alternative paper product like packaging or cardboard."

Hence, they believe we should not include recycled content in printing-writing paper.

Printing-writing paper: Papers used for publishing and advertising such as office and copy paper, magazines, stationery and commercial publications.

These statements don't tell the full story. In reality:

1) Every year, there are still millions of tons of paper not collected for recycling;[2]

2) Producing recycled paper uses less total energy and releases less carbon into the atmosphere than producing virgin-tree-fiber paper[3] (virgin paper mills often burn a polluting substance called "black liquor" offsetting fossil fuel use, so they get to claim they are using less fossil fuel even if their carbon emissions are still greater than that of recycled paper mills); and,

3) When comparing the same paper grade, recycled paper always uses less hazardous chemicals than does virgin-fiber paper.[4]

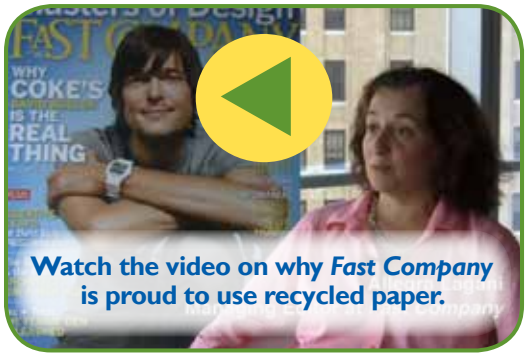
Therefore, the US should maximize recycled content in all paper grades—including in printing-writing papers.

Unfortunately, some paper buyers are starting to believe the misleading claims made through heavy marketing efforts to oppose recycled paper. *Green in All Grades* discusses and dissects the key arguments from the recycled paper detractors so that

paper purchasers can best understand, and remain confident and comfortable that purchasing and using recycled paper is the best choice for the environment, climate, and people. In fact, the benefits are wide-ranging, from mitigating climate-change impacts, to creating more jobs,[5] to protecting biodiversity and improving air and water quality, and much more.

THE FOURTH R: REDUCE-REUSE-RECYCLE-*REQUEST*

Paper consumers' actions and decisions have an impact on the supply of environmental paper. Those who watched television in the late 1980's would have seen Doritos® commercials with spokesperson, Jay Leno. He succinctly summed up demand-side economics by encouraging people to eat all the Doritos® they wanted because, "We'll make more." The basic economic principle is that a product's supply will correlate closely with demand.



And this principle remains consistent with the recycled paper market in many ways. As publishers and consumers have increasingly requested recycled paper, the number of recycled papers on the market[6] and the percentage of paper collected and diverted from landfills and incinerators have increased.[7]

Therefore, "request" should assume a place as the "Fourth R" in the popular "reduce-reuse-recycle" refrain, one of the most ubiquitous in society's environmental awareness. Many prominent publications, such as *Fast Company,* request recycled paper and help spur this green industry.

AN OPPORTUNITY FOR ALL

There are hurdles to improving sustainable paper production and use. As a result, fantastic opportunities exist to create alliances between industry and nonprofit organizations and bridge differences in order to get past obstacles. In fact, collaboration may be the only way to surmount the hurdles and position the paper industry to thrive in the 21st century—especially in the face of the current economic, environmental, and climate crises.

I. THE CASE FOR RECYCLED CONTENT IN ALL PAPER GRADES

Printing-writing papers have the most intensive manufacturing process of nearly all paper types. Each ton of recycled magazine paper that displaces virgin-fiber paper reduces energy, global-warming pollution, wastewater, and solid waste, and it saves trees.[8] Therefore, including recycled content in magazine-grade paper has a very significant and important role in reducing environmental impacts of paper production.

Virgin vs. Recycled Magazine Paper[9]

	1 TON VIRGIN FIBER PAPER	1 TON 100% RECYCLED PAPER	ENVIRONMENTAL SAVINGS FROM RECYCLED CONTENT
Trees	17 trees	0 trees	100%
Net Energy	31 million BTUs	23 million BTUs	26%
Wastewater	17,295 gallons	9,876 gallons	43%
Greenhouse Gases	6,511 pounds CO_2 equiv.	3,891 pounds CO_2 equiv.	40%
Solid waste	2,269 pounds	1,570 pounds	31%

In addition to providing environmental benefits, manufacturing recycled paper also generates green jobs. The recent report *More Jobs, Less Pollution*[10] found that for every 1,000 tons of paper that are recycled rather than sent to a landfill:

- Between one and two jobs are created for paper collection;
- Two jobs are created for paper processing; and,
- Four jobs are created for recycled paper manufacturing.

Despite the dramatic environmental benefits of recycled magazine paper, some detractors believe that recycled content should only be added to packaging, newsprint, and cardboard. Below we will unpack these claims and demonstrate how recycled printing-writing paper is the best choice for the planet.

PAPER SCARCITY, REALLY?

The crux of the recycled paper objections is that recycled content should be allocated and used for only certain grades of paper. According to these industry objectors, there is not enough waste paper to collect and turn into new recycled paper for all types of paper, so the collected waste paper should go to the paper grades that require the least energy and chemical processing.

However, all the existing data supports quite a different conclusion: There are millions of tons of paper not being collected for reuse.

Recycled magazine paper can be made from old newspapers and old magazines. While old newspapers are recovered for recycling at a high rate in the US (73 percent[11]), only 25 percent of magazines are recycled from the home each year[12] (or approximately 4 billion magazines[13] are not recycled each year).

Recycled magazine paper can also be made from recovered printing-writing papers, like office paper. The American Forest and Paper Association (AF&PA) estimates that we currently collect only about 57 percent of printing-writing paper through recycling efforts.[14] Conservatively estimated, at least 75 percent[15] of all paper products are recoverable, which means we could feasibly collect over nine million more tons of printing-writing paper.[16] In other words, we are not at "peak recovered fiber."

FIBER EFFICIENCY COMPARISONS

The truth of the matter is that it is much more resource-efficient to use recycled paper to make new paper than it is to use virgin tree pulp—because recovered paper has already been processed to remove the non-usable tree parts, water, etc. As a result, one ton of recovered paper makes more paper than one ton of fresh trees. In other words, making recycled paper is less wasteful than making virgin-fiber paper.

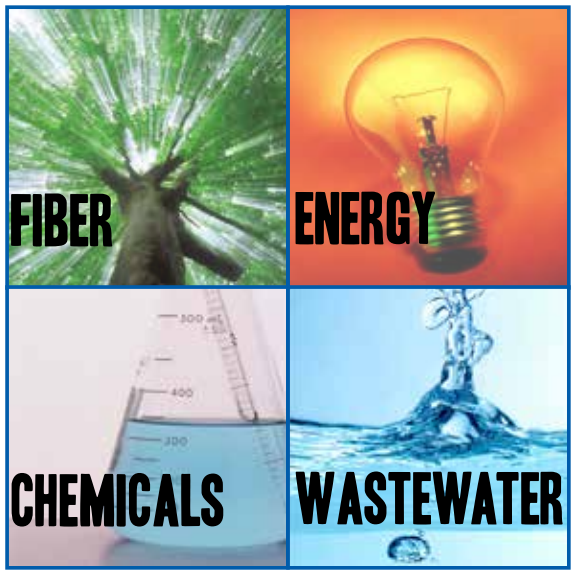
TYPE OF PULP	AMOUNT OF MATERIAL REQUIRED TO PRODUCE 1 TON OF PULP	FIBER EFFICIENCY
Virgin fiber printing-writing paper pulp *(virgin chemical/kraft pulp)*	4.4 tons of trees*	23%
Virgin fiber newsprint *(groundwood/mechanical pulp)*	2.2 tons of trees*	45%
Recycled printing-writing paper pulp *(recycled chemical/kraft pulp)*	1.4 tons of 100% recovered paper	71%

*fresh trees before drying

Source: Conservatree and Environmental Defense Fund. "Deinking Pulp Mill Capacity Study 2001."

II. APPLES TO APPLES: MAKING THE RIGHT COMPARISON

Too frequently, some paper suppliers will tell magazine publishers that recycled paper is not the best environmental choice for printing-writing grade papers. They compare the environmental impact of making recycled printing-writing paper to making recycled paperboard (think shoeboxes) and newsprint. Then they deduce that since the environmental footprint of recycled printing-writing paper is greater than that of paperboard and newsprint, we shouldn't make recycled printing-writing paper.



This only makes sense if there is a scarcity of recovered paper and we are forced to allocate our limited supply to only certain paper grades. As we explained earlier, there are still millions of tons of paper that we could collect (see "Paper Scarcity, Really?" on page 9) and turn into a wide array of recycled paper products—all of which environmentally outshine their virgin counterparts.

Comparing recycled printing-writing paper to recycled packaging and newsprint is also nonsensical because the type of paper that purchasers use is predetermined based on the product: an office manager would never consider making photocopies on paperboard, nor would book publishers ever think of printing on toilet paper. The choice that purchasers have is between including recycled content in their paper, or using 100 percent virgin fiber. For magazine publishers, this means that the accurate environmental comparison is between magazine paper produced with recycled content or without it, and in that comparison, recycled paper always demostrates greater environmental benefits, particularly for fine printing-writing papers (see page13).

When you compare apples to apples (virgin printing-writing paper to recycled printing-writing paper), it is clear that recycled paper production saves energy, uses safer chemicals, and uses natural resources more efficiently.

1. FIBER SOURCING: TREES VS. RECOVERED PAPER

Fiber from Trees: Deforestation

Paper production contributes to a large ecological footprint on forests, as around 40 percent of the world's commercially cut timber is processed for paper.[17] Many people associate deforestation with places like the Amazon and Indonesia—but it also exists in North America. Trees in the southern and southeastern US, as well in the Pacific Northwest (which contain some of the last remaining old-growth forests) provide the United States with a large portion of the wood supply that manufacturers use for timber, paper, or fuel.

According to the report Flushing Forests, the Boreal Forest in Canada stores 23 percent of the planet's terrestrial carbon - more carbon per acre than any other ecosystem on Earth, including tropical forests. However, as the same report mentions, Canada's old-growth and intact forests are logged at a rate of five acres a minute, 24 hours a day, thereby reducing the carbon storage opportunity.[18]

Fiber from Trees: Industrial Tree Plantations

Deforestation is not the only problem associated with virgin tree fiber. Growing trees in industrial tree plantations[19] for paper production can also be environmentally damaging. Often times, paper companies claim that they replant the natural forests they cut down with new trees. However, industrial tree plantations are a far cry from natural forests. In fact, industrial tree plantations have 90-95 percent less biological diversity than natural forests.[20]

GreenPeace.

Logging in Malaysian forests, home to the Penan people.

These industrial tree plantations require a litany of synthetic herbicides, pesticides, and fertilizers, including some that have been closely correlated with known environmental health hazards including irritation to the skin, eyes, and respiratory system.[21] For example, in 2006, several environmental health journals reported that glyphosate, an herbicide used in industrial forestry, was closely linked to non-Hodgkin's lymphoma, kidney damage, and reproductive damage.[22, 23, 24, 25, 26]

Fertilizers for industrial tree plantations can run off into local rivers, lakes, streams, and other bodies of water. This can alter the chemical balance of the water, making it impossible for native animals and plants to live in their natural habitat. Additionally, in most of the states in the southern US, few or no laws exist to require buffer zones around population centers such as residences and day care centers.[27]

Recycling bins with separate steams for paper and metals/plastics

Fiber from Recovered Paper: Environmental Savings

Unlike virgin-fiber paper which relies solely on trees, recycled paper depends on recovered paper from recycling programs. Different grades of recycled paper are manufactured from separate supplies of recovered paper.

For example, printing-writing paper needs to be whiter than newsprint, and therefore requires collecting paper with limited amounts of color. It's also best to collect high-grade paper to recycle into new printing-writing papers, rather than recycling high-grade paper into newsprint or packaging.

This is because printing-writing papers can be recycled seven to twelve times. On the other hand, newsprint can only be recycled three to four times before the fibers become too short to use.[28] Every time high grade printing-writing paper gets recycled into newsprint or packaging, its lifespan decreases and mills must turn to trees to obtain new sources of fiber.

In addition, manufacturing packaging materials and newsprint uses fewer resources than producing printing-writing paper. As such, if manufacturers use recycled fiber to produce cardboard, newspaper, and other similar grades of paper, they are offsetting paper production that already has the lowest environmental impact rather than offsetting the very intensive production process for virgin

printing-writing paper. Therefore, it's important to use high-grade recovered paper to produce recycled printing-writing paper and thereby offset the most damaging environmental impacts.

Despite the known benefits from producing recycled printing-writing paper, very little paper actually gets recycled into new printing-writing paper.

Recycled Paper Comparisons[29]

	PRINTING-WRITING PAPERS	TISSUE	NEWSPRINT
Percentage of North American Market	28%[30]	8%	12%[31]
Average Recycled Content	6%	45%	32.5%

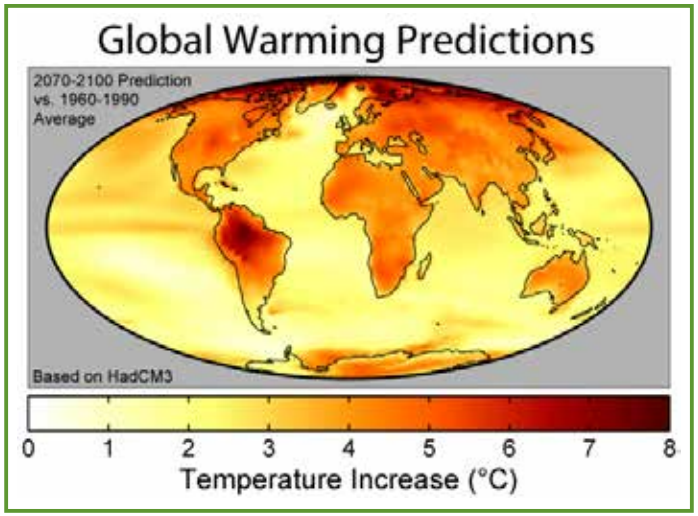
Given the benefits of producing recycled printing-writing paper, such a limited use of recycled content in this paper grade has worrisome implications for our planet and health.

2. ENERGY USE: VIRGIN VS. RECYCLED PAPER

The earth's climate has changed over the past century and will continue to change over the next few decades.[32] There is no silver-bullet solution to global climate change, but since paper-making is the fourth largest manufacturing source of green-house gases (after petroleum, cement, and chemical products),[33] reducing carbon dioxide emissions from the paper industry is one way to curb climate change.[34]

Energy: Virgin Paper Production

Transforming a tough, brown tree into a flimsy piece of white paper takes a tremendous amount of energy. According to AF&PA data, there has been no improvement on



"total energy use per ton of paper product" over the last decade.[35]

Even though the "total energy use per ton of product" has remained the same, the paper and pulp industry has claimed, "fossil fuel greenhouse gas emissions for the manufacture of pulp and paper in the United States and Canada decreased approximately 33 percent from 2000 to 2008."[36] How is this possible if harvesting trees, transporting logs, pulping logs, drying pulp, and processing pulp into paper all require energy? The answer lies in an accounting loophole.

Generally, virgin paper manufacturers get their energy from three sources: purchasing electricity from the grid (which mainly comes from fossil fuels), burning biomass (wood chips, tree parts, etc.) and/or combusting black liquor (a mix of the organic and chemical waste product from the kraft pulp manufacturing process).[37]

The paper and pulp industry has used approximately the same amount of total energy over the past decade, but they have substituted biomass and black liquor for fossil fuels. However, they are not required to report their carbon emisisons from biomass and black liquor. So even though their fossil fuel emissions have decreased over the past decades, they emit the same amount of greenhouse gases into our atmosphere—but from biomass and black liquor.

As the journal *Science* indicated, burning black liquor and biomass indeed release greenhouse gases and hence contribute to global warming.[38] Since we face a grave climate crisis, we must account for all carbon releases—regardless of whether the emissions are from fossil fuels or biofuels.

Therefore, the environmentally meaningful question should be: which manufacturing process emits less global warming pollution? And the answer to that question is producing recycled paper.

Energy: Recycled Paper Production

As the AF&PA stated on their website Growthevote.com, recycled printing-writing production saves energy and reduces greenhouse gas emissions compared to virgin printing-writing paper production.[39]




DANGEROUS CARBON EXEMPTIONS: BLACK LIQUOR AND BIOMASS

Paper mills are not mandated to report the carbon emissions from burning biomass and black liquor for energy. However, ignoring carbon emissions from biomass and black liquor is a mistake because "emissions from producing and/or refining biomass also typically exceed those for petroleum."[40]

Biomass

Many paper mills get a portion of their electricity from burning biomass—which consists of tree parts that can't be used in the paper production process (like bark or branches). Since trees can grow back after they are cut down, paper mills claim that burning forest products for energy is "carbon neutral," and hence, "good for the environment." However, there are dangerous climate problems associated with logging trees for fuel. In particular, chopping down trees for biomass deprives the planet of carbon-absorbing trees.

▶ Watch this video from The Natural Resources Defense Council (NRDC) to learn more.

Despite serious concern from the scientific community, biomass-burning facilities were spared from needed regulation when in 2011 the EPA gave "biomass a three-year pass while the agency studies the effect of plant emissions on climate change."[41] Meanwhile, EPA's insufficient regulations continue to allow industries to skip Title V operating permits even if they mix biomass ***with coal*** to generate electricity.[42] This free pass incentivizes biomass energy production, and as a result biomass facilities are popping up throughout the US, including projects in Texas,[43] Florida,[44] New Hampshire,[45] and Washington.[46]

▶ Read the letter from 90 scientists raising concerns about biomass-burning facilities.

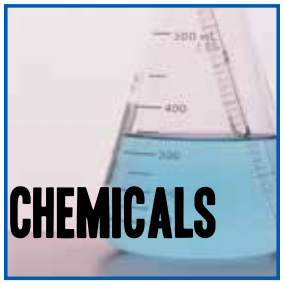
Black Liquor

Paper companies have burned black liquor for power since the 1930s, and in 2009, they exploited a loophole in the IRS incentive for alternative fuels by adding a small amount of diesel fuel to the black liquor and then claiming it as an "alternative fuel."[47] As a result, US taxpayers gave the paper industry 8 billion dollars in federal subsidies in 2009 and 2010 for burning black liquor.[48] According to the *Washington Post*, "The paper industry received more federal money than almost any industry outside the auto sector."[49] To be clear, there was nothing illegal about what the paper companies did in claiming the tax credit. However, exploiting this loophole defeated the purpose of the tax credit: spurring truly clean and renewable energy.

The black liquor boondoggle was nothing new. For over a century, paper companies have received billions of taxpayer dollars in the form of tax breaks, subsidies, new roads into forests to transport logs, research from state-supported universities, etc.[50]

By contrast, the recycled paper industry has received little in the way of government incentives.[51] The black liquor loophole gave an outrageously substantial handout to virgin paper manufacturers, which allowed them to artificially reduce the price of virgin fiber. Paper companies and nonprofit organizations need to work together to even the playing field by ensuring both recycled and virgin manufacturers are playing by the same rules.

Not only does the manufacturing process require less energy, but also paper recycling maintains the ongoing sequestration of carbon in trees that would otherwise need to be harvested to manufacture paper.[52]



3. CHEMICAL USE: VIRGIN PAPER VS. RECYCLED PAPER

Virgin Paper: Chemical Pulping and Whitening

Publishers want their paper to look bright and last a long time. To achieve this, paper manufacturers remove the lignin (the naturally occurring "glue" that provides structural support to the tree) and other tree parts through a chemical pulping process (also called "kraft" or "sulfate" pulping). This process chemically "cooks" down the tree so that only the pure cellulose pulp remains.[53]

Chemical pulping is the most resource-intensive and environmentally taxing method of pulp production.[54] In particular, chemicals from the pulping process can include unsafe levels of cancer-causing chemicals.[55] These substances can end up in the air the mill employees breathe and on the tools they use.[56]

After a paper mill chemically turns a tree into pulp, the pulp needs to be "whitened" to create printing-writing papers. This process is typically called "bleaching" for virgin fiber. The main objective of this process is to have the fiber reach a "brightness level" that is about 30-50 percent brighter than the natural brightness of tree fiber.

Bleaching virgin pulp has significant environmental and health impacts, including releasing dioxins.[57] Why are dioxins so worrisome? According to the National Academy of Sciences, dioxins are among the most toxic anthropogenic substance ever identified.[58] Moreover, animal and human studies demonstrate that dioxins and dioxin-like compounds might contribute to thyroid dysfunction, lipid

BLACK LIQUOR SPILL

Pulping chemicals from paper mills can wind up in neighboring communities. For example, in August 2011 a kraft paper mill in Bogalusa, Louisiana, spilled millions of gallons of a byproduct of the chemical pulping process (called black liquor) into the Pearl River.[60] The chemicals contaminated the river, its tributaries, and Lake Pontchartrain, killing hundreds of thousands of fish and posing health risks to communities along these waterways.[61]

Photo courtesy of freerepublic.com

Bogalusa fish kill

View this video to learn more about the black liquor spill.

disorders, neurotoxicity, cardiovascular disease, and metabolic disorders.[59]

To reduce the emission of dioxins and other harmful chemicals, in the late 1990s, the EPA adopted bleaching regulations called the "Cluster Rules"[62] for virgin kraft mills (the most common type of pulp mill in the US). Due to heavy lobbying from the virgin paper industry, the Cluster Rules were weakened, and the EPA squandered an opportunity to drastically reduce the harmful impacts from bleaching virgin pulp.

The Cluster Rules set low standards that mills could meet by just by using chlorine dioxide instead of chlorine gas in the bleaching process. Bleaching with chlorine dioxide continues to create cancer-causing dioxins, although at a reduced level compared to bleaching with chlorine gas. But using chlorine dioxide does nothing to reduce the total of amount of polluted wastewater mills create.[63]

Even years after the adoption of the Cluster Rules, the pulp and paper industry still ranks fourth among US manufacturing industries in the release of dioxin and dioxin-like compounds to the air, and third in releases of these cancer-causing chemicals to water.[64]

There is a cleaner and safer alternative to chlorine dioxide bleaching—a process called oxygen delignification (OD). OD reduces water pollution and is required for certain

methods of dramatically cutting wastewater discharges.[65] Furthermore, OD reduces chemical and energy use, thereby making mills more cost-competitive.[66] It is also necessary for "totally chlorine free" (TCF) bleaching—a process that does not create any carcinogenic dioxins.[67] Unfortunately a very small percentage of the world virgin pulp production is TCF.

Most virgin kraft mills in the rest of the world use OD to bleach their paper, but only half of American mills use this clean technology. Why is this? It is because the largest US paper companies opposed regulations that would have required all mills to use OD, an upgrade that would have required significant capital investments.[68] These American mills refused to invest in clean OD technology, and as a result are less efficient and more polluting than their global competitors.

Recycled Paper: Re-Pulping and Whitening

Remember those spitballs? To turn recovered wastepaper back into pulp, mills can use mechanical techniques and relatively safe chemicals. To make recycled pulp (called "deinked pulp"), there is no need to use intensive kraft or sulfate chemical methods that virgin kraft papermaking requires.

Instead, recycled paper mills use a de-inking facility, which is basically a high-tech blender and washing machine that removes the ink and other contaminants from recovered paper by using water, soaps, chemicals, screens, centrifuges, and other sorting devices.[69] The chemicals used to create deinked pulp include sodium hydroxide, sodium hydrosulfite,[70] hydrogen peroxide, and occasionally sodium monpersulfate[71, 72]—none of which are classified as carcinogenic.[73]

Futuremark Paper Mill and its deinking facility.

Next, these facilities "re-whiten" the deinked pulp. Since recovered paper has already gone through the bleaching process when it was first created, deinked pulp doesn't need to be re-bleached to the same degree as it was originally and is often re-whitened using hydrogen peroxide, rather than chlorine dioxide.[74] Deinked pulp only needs to increase its brightness by about 10-15 percent compared to the 30-50 percent increase

required for virgin pulp.[75] This means that recycled paper mills can produce bright printing-writing papers with less chemical use and harm to the planet.

4. WASTEWATER: VIRGIN PAPER VS. RECYCLED PAPER

Virgin Paper: Wastewater

In the US, the paper industry is the "largest user per ton of product of industrial process water."[76] As one of the largest industrial water users, the paper industry generates extraordinary amounts of wastewater. According to Allen Hershkowitz, author of *Bronx Ecology*, paper mills in the US generate "approximately 1,551 billion gallons of wastewater annually."[77]

The 2011 *State of the Paper Industry Report* found: "[There] has been essentially no reduction in paper industry water pollution between 2000 and 2008. For three critical indicators of water pollution—total suspended solids (TSS), biochemical oxygen demand (BOD), and wastewater discharge per ton of product produced—the discharge levels were virtually unchanged in this time period."[78]

These billions of gallons of wastewater create a toxic "soup" that is discharged into streams, rivers, and lakes. These water pollutants include conventional and hazardous pollutants as well as volatile organic compounds (VOCs). Some of these toxic pollutants include chlorinated dioxins and furans, chloroform, adsorbable organic halogens, methylene chloride, trichlorophenols, and

Photo courtesy of Natural Resources Council of Maine

A virgin paper mill's waste lagoon.

pentachlorophenols.[79] As a result, bodies of water contaminated by these chemicals can become uninhabitable for many different species and can have an adverse effect on local communities.[80]

In addition to chemical discharges, paper mill wastewater can be a higher temperature than the river or lake it is dumped into. According to the UN Food and Agriculture organization, increased temperatures can have a harmful effect on fish and other aquatic species.[81] For example, in North Carolina at least 8,000 fish died in 2007 as a result of high water temperatures in the Pigeon River, caused by discharges from the Evergreen Packaging paper mill.[82] In response to the massive fish die-off and ongoing pollution concerns, a coalition of environmental organizations filed a formal challenge against a state water pollution permit that they argued didn't go far enough to protect the Pigeon River. As of May 2012, environmental groups reached a partial settlement with Evergreen Packaging that will require Evergreen Packaging to monitor the temperature of its wastewater emissions weekly rather than monthly.[83]

Recycled Paper: Wastewater

Recycled paper mills produce much less water pollution per ton of product than virgin paper mills. Some virgin newsprint mills use twice as much water per ton of manufactured product than do recycled newsprint mills.[84] In terms of printing-writing paper, for each ton of recycled fiber that displaces a ton of virgin fiber during the manufacture of magazine paper, total wastewater is reduced by 43 percent.[85]

As mentioned earlier, FutureMark is a recycled paper mill outside of Chicago and offers a prime example of the water savings associated with recycled paper production. According to Glen Johnson, Manager of Technical Services, FutureMark uses 2-3 million fewer gallons of water per day than a comparable virgin mill, and Johnson believes the mill can reduce that by up to 50 percent with further investment.[86]

III. SUCCESSFULLY INCLUDING RECYCLED PAPER IN MAGAZINES

As this white paper has shown, using recycled paper in magazines—and all printing-writing papers—can protect forests, rivers, and our climate. Once magazine publishers have separated out the fact from fiction and recognize the dramatic environmental savings associated with using recycled paper, they can drive change in the paper production industry.

The publishing industry has a long history of influencing paper production. For example, when publishers demanded lighter paper to combat postal increases, paper mills manufactured paper with lighter basis weights. And when publishers requested whiter paper to satisfy advertisers, paper companies created brighter paper stocks. If publishers began demanding more recycled paper, mills would be forced to manufacture more eco-friendly paper in order to maintain their business.

The remainder of *Green in All Grades* provides concerned publishers with some tools and resources to switch to recycled paper and grow a sustainable publishing movement.

Recycled paper magazines in a Better Paper promotion at Barnes & Noble.

STEP 1: OUTLINE A POLICY

Currently only about two percent of magazine titles use recycled paper regularly.[87] In order to create a thriving magazine industry, every publisher needs a paper procurement policy, or "road map" for achieving sustainability. Policies must be established as a process to be continually improved. These policies should be grounded in science, include environmental metrics and help internal and external stakeholders understand the company's paper priorities.

Continual Improvement

How can a paper procurement policy help guide paper purchasing decisions in a constantly fluctuating market? The goal should be to articulate realistic goals that are actionable today, while also setting out aspirational goals for the magazine in five or ten years. Doing so addresses what's achievable today as well as helps create market signals for investors and the manufacturing industry. A strong procurement policy will include the four components of the Environmental Paper Network (EPN) Common Vision For Transforming The Pulp & Paper Industry Towards Sustainability, outlined immediately below.

Learn more about the Common Vision to change corporate paper policies, endorsed by over 100 environmental nonprofit organizations.

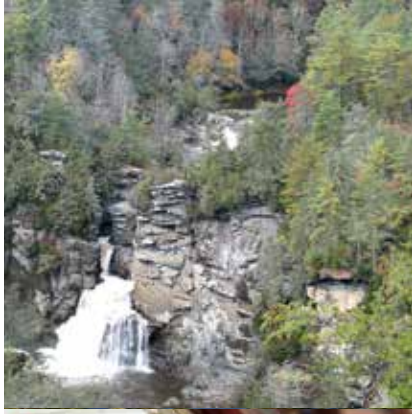
Environmental Protection

The EPN created a Common Vision for environmental paper use founded upon four sustainability "pillars":

1) **Minimize Consumption:** Efficiently using paper is an easy way to save forests and money. Magazine publishers can use lighter basis weights, reduce their trim size and limit overproduction on the newsstand.

2) **Maximize Recycled Content:** Printing on paper with recycled content is the best way a magazine can protect the planet. It reduces pressure on harvesting forests, leaving more mature trees standing, which helps mitigate climate change impacts, and the production process is dramatically less harmful to the environment.

3) **Responsible Virgin Fiber:** All virgin tree fiber should be credibly certified as coming from



well-managed forests that protect communities and the environment. Virgin fiber should not come from endangered forests,[88] high conservation value forests, or genetically modified trees. Currently, the Forest Stewardship Council (FSC) is the most rigorous and credible certification scheme. Other certification systems like the Sustainable Forestry Initiative (SFI) or the Programme for the Endorsement of Forest Certification (PEFC) do not adequately address issues such as clear-cutting, old-growth forest destruction, illegally logged international timber, the excessive use of toxic pesticides and herbicides, and the violation of indigenous people's rights.[89]

FSC Certified Forests are the best source for virgin wood.

Virgin fiber doesn't necessarily need to come from trees. Publishers should also be open to exploring paper with alternative fibers, such as agricultural residues, bamboo, and kenaf (a herbaceous plant related to cotton and okra). In many instances, alternative fibers are environmentally and socially preferable to virgin tree fiber.

4) **Clean Production:** It's important to encourage cleaner production at pulp and paper mills, and printing facilities. Ask facility operators what types and how much energy they use, how they plan on reducing air and water pollution and if their paper bleaching process goes beyond the legal floor of "Elemental Chlorine Free" (ECF) bleaching. Using oxygen delignification (OD) in an ECF process, or Processed Chlorine Free (PCF) and Totally Chlorine Free (TCF) are all better choices for the planet than ECF bleaching.

Engaging Industry Stakeholders

Successfully creating a policy requires a multi-stakeholder approach that includes publishers, paper manufacturers and suppliers, printers, environmental non-governmental organizations, and others. Effectively engaging all stakeholders will

increase the likelihood of success by accounting for and addressing the various economic, logistical, and environmental challenges in the process. For instance, if environmentalists ignore the economic realities that publishers face, they could propose unrealistic solutions. Similarly, if publishers create paper policies without good communication with environmental experts, they run the risk of committing to a plan that may have little or no meaningful environmental improvements.

Sharing a commitment to specific outcomes is a key factor to successfully engaging various stakeholders. All magazine stakeholders have at least one thing in common: an interest in developing a successful magazine industry. From there, each group can help identify and assess the short-term opportunities that can contribute to longer-term economic and environmental gain.

STEP 2: COLLABORATE

If you want to go fast, go alone; if you want to go far, go together.

This African proverb can be a guiding philosophy on how publishers can drive innovation and the development of environmental papers. In a relatively quick manner, a magazine's staff can draft a paper procurement policy because they control the decision-making process for their paper use. However, publishers are not in control of the means of production for paper (except how their demand sends market signals). Therefore, it is helpful and important for publishers to work together with stakeholders on the longer journey to continually improve their sustainable paper use.

Engaging environmental organizations with paper expertise in the process is crucial. They can provide valuable tools, resources, and perspective on environmental solutions—unencumbered by financial self-interest. Consider the *Paper Task Force Report* mentioned earlier in this paper's introduction. Published in the mid-1990's, the report has remarkable staying power and relevance—much of this success due to the collaborative effort of diverse stakeholders ranging from very large for-profit paper users, to an environmental nonprofit, to a university.

The Canadian Boreal Forest Agreement (CBFA) is another important success resulting from the involvement of a wide range of stakeholders. This landmark agreement covers more than 76 million hectares of public forests licensed to Forest Product Association of Canada (FPAC) member companies across Canada. Twenty-one FPAC forest company members and nine environmental organizations worked together, and the FPAC members committed to the highest environmental

standards of forest management and conservation while the environmental organizations committed to global recognition of the FPAC members' efforts.[90]

This unusual alliance of industry and environmental groups has led to a mutually beneficial agreement and demonstrates what is possible with good-faith collaboration.

STEP 3: "REQUEST" RESULTS

What is clear is that when publishers request recycled paper, the market works to satisfy that demand. Today, according to the nonprofit organizations Conservatree and Canopy, there are over 55 printing-writing papers with recycled-fiber content that are available for magazine publishers.[91]

Publishers and printers can harness their purchasing power to make buying and using recycled paper more cost-efficient. In fact, this is how the North American newspaper industry became more sustainable in the 1980s:

> *"Newspaper publishers began requiring recycled content in the newsprint they bought—some pushed by legislation, others creating voluntary agreements. Newsprint mills in the United States and Canada made a major technological shift by adding several new deinking mills and advancing the existing technology."*[92]

When paper buyers request recycled paper from their supplier, it triggers a much larger structural shift for environmental papers. It fuels improvements in paper collection and sorting systems, and provides confidence for recycling infrastructure investment. In 1990, the US recovered approximately 33 percent of all used paper products.[93] Throughout the early 2000s, various environmental organizations encouraged large and small paper users to request recycled content in the paper they purchased, and now 66.8 percent of paper in the US and 66 percent of the paper in Canada is collected for recycling.[94] One way we could achieve a 75 percent recovery rate for used paper is by continuing to request recycled paper.

STEP 4: WORK WITH THE BETTER PAPER PROJECT

Many magazine publishers continue to miss the environmental and economic benefits of shifting to recycled paper because they fear recycled paper might not be suitable for high-quality publications like magazines. As James Shaheen, the Editor-in-Chief of *Tricycle Magazine*, commented, "At first when we talked about using recycled paper, I imagined printing on a brown paper bag. However, recycled paper has come a long way over the last few years."[95] *Tricycle* is one of hundreds of magazines that proudly use high-quality recycled paper and prove that a beautiful publication can include recycled content.

Green America's Better Paper Project is the only US nonprofit program devoted to helping magazine publishers like *Tricycle* go green by separating out myths from reality. Our expert team provides guidance on navigating the world of environmental papers, crafting procurement policies, and understanding the market trends for recycled paper.

The Better Paper Project helps green magazines stand out through newsstand promotions like this one at Books-a-Million.

Once publishers have committed to using recycled paper, we celebrate that achievement with exclusive bookstore and online promotions that call out these titles as environmental leaders. We also organize the Better Paper Buying Club that allows publishers to aggregate their paper purchasing in order to get the best environmental paper at the lowest cost.

IV. CHALLENGES TO SUCCESS

Even with a strong policy, collaboration, increased demand, and support from the Better Paper Project, it can be a bumpy road to recycled paper. There are some challenges—but also opportunities—when shifting the magazine industry in a sustainable direction. With the EPN, the Green America Better Paper Project has been working to address these "macro-level" issues of manufacturing capacity constraints, increasing paper recovery rates, and lack of recycling coordination.

CAPACITY LIMITS

One pressing obstacle to increasing the availability of recycled printing-writing paper is that more high-grade deinking plants are needed to satisfy significantly growing demand. At some point in the future, as more publishers demand recycled paper for their magazines, the industry will reach a "bottleneck" of production capacity if additional deinking facilities do not come online. While increasing demand is still critical to send market signals to producers and the investment community, the paper manufacturing, environmental, and government stakeholders must collaborate to prevent any bottlenecks from occurring.

According to Conservatree, both the tissue and newsprint sectors have significant deinking capacity, but this is not true for the printing-writing paper sector. The paper industry argues that building the necessary deinking capacity for recycled printing-writing grade paper is too expensive. However, in order to achieve higher levels of recycled content, the paper industry must build more deinking plants. Of course, the best way to provide the industry with the confidence that their construction investment is worthwhile is by demanding more recycled paper.

The industry may be in a position to increase deinking capacity by opening closed deinking facilities, such as a closed deinking mill in eastern Washington.[96] This

investment could pay off in the long run, because many North American paper suppliers sell recycled paper at competitive prices.

MAXIMIZING PAPER RECOVERY

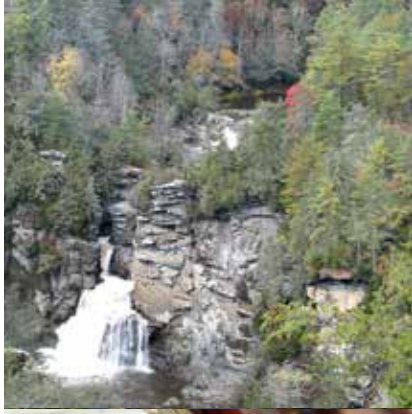
The American Forest & Paper Association (AF&PA) and the EPN, of which the Green America Better Paper Project is a founding member, have started to work together on strategies to divert more high-grade paper into recycled paper production. What will it take to increase our paper collection rates?

A landfill in Kansas.

1) The first step is to understand and address the deficiencies of the residential and commercial recycling programs. More than half the US population still has no access to curbside programs, which prevents valuable and recoverable paper from being reused.[97] Office buildings also could improve their recycling practices because currently nearly half of the wastepaper in offices is sent to landfills rather than recovered.[98]

2) The second step is to demand more recycled paper. The importance of generating demand cannot be overstated in a market economy. Buying recycled paper sends an unequivocal signal that used paper is a valuable resource. When major purchasers request recycled paper, it creates incentives for entrepreneurs to collect more of the latent waste paper supply. Savvy businesspeople and municipalities can create a successful business plan to sell currently untapped waste paper reserves to recycled paper deinking facilities.

3) For the third step, it is important to keep the supplies of collected paper "clean." This means reducing contaminants of food, liquid, and non-paper items that lower the value of




the recovered product. Doing so will increase the chances that the recovered paper is sold to domestic markets. While most of our recovered paper remains on shore, 42 percent is exported[99]—mostly to China.[100] One of the reasons this happens is that China is willing to buy low-quality recovered paper from the US to make boxes and other packaging materials. If our domestic recycling system did a better job of keeping paper clean and well-sorted, it would be an ideal resource for high- quality recycled paper manufacturing here in North America.

Dual-stream recycling bin.

POOR COORDINATION

Thousands of governments, associations, schools, residents, businesses, organizations, and paper companies—each with their own priorities—establish local recycling programs. There is no entity that helps coordinate and synchronize all these recycling efforts.[101] This is an unfortunate void because the core objective of recycling is to save as many resources as possible.

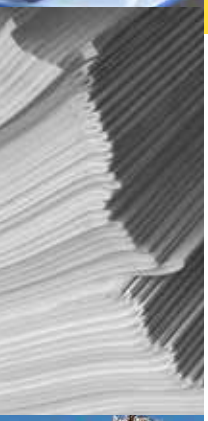
"Single-stream" recycling is an example of how poor coordination and communication creates challenges. A municipal government typically wants to increase participation in recycling programs to divert resources from landfills and save the city landfilling costs. Instituting single-stream recycling programs increases participation rates, but reduces the "usability" of the recycled materials and diminishes the environmental and natural resource savings. The "cross-contamination" of the recycled materials in the single-stream programs requires separating out the various recycling components, which becomes very labor intensive—a big reason why so much of our used paper gets shipped to China where the labor costs are lower. So while cities might benefit from single-stream recycling, the US recycled paper industry suffers.

CONCLUSION: *GREEN IN ALL GRADES*

At this point in time, human activity has "degraded almost 80 percent of what remains of the planet's once vast forests."[102] Producing more virgin paper, which requires harming our natural ecosystems, is not a sustainable solution to the growing global paper demand. However, a solution is within reach—utilizing the vast reserves of recoverable paper that are not currently being collected and turned into recycled paper.

The research presented in *Green in All Grades* makes clear that using recycled content in all grades of paper is the best choice for protecting the environment, and that the magazine industry, which uses some of the most environmentally damaging papers, has a special obligation to use recycled fiber papers. It is helpful to keep in mind that the arguments against using recycled paper for magazines come predominantly from those in the paper industry with little or no manufacturing infrastructure to make recycled paper efficiently and economically. Recycled paper use—especially in printing-writing grade paper, which involves the most intensive production processes—protects forests and ecosystems, reduces pollution in air and water, and helps mitigate the effects of climate change because it uses less total energy and leaves mature trees standing to absorb carbon.

Magazine publishers can help protect natural resources by demanding recycled paper and supporting an industry that generates good green jobs today and conserves our forests, rivers, and clean skies for tomorrow.



The Paper Steps from the **Environmental Paper Network** Help Publishers Climb the Ladder to Environmental Leadership.

Paper Steps

Taking the Steps to Environmentally Responsible Paper

In the Steps below, 'environmental attributes' are defined as:

- Post-consumer Recycled Fiber
- Pre-consumer Recycled Fiber
- Agricultural Residue Fiber
- Forest Stewardship Council (FSC) Certified Virgin Fiber[1]

ENVIRONMENTALLY INFERIOR PAPER

This paper has no, or very minor, environmental attributes

MEETS NO MINIMUM CRITERIA:

- No/minimal recycled content
- Virgin tree fibers not FSC-certified
- Paper bleaching not Enhanced Elemental Chlorine Free (EECF)[2], Process Chlorine Free (PCF) or Totally Chlorine Free (TCF)

ENVIRONMENTAL IMPACT:
100% virgin paper emits 5,483 to 6,855 pounds of greenhouse gases and consumes 15-26 trees per short ton.[3]

TRANSITIONAL PAPER

Meets the minimum criteria below and at least 10-30% of fiber has environmental attributes

MINIMUM CRITERIA:

- 10% post consumer OR may be 100% virgin only if it has FSC certification
- Virgin fiber can not be from controversial sources[4/5]
- Paper bleaching not Enhanced Elemental Chlorine Free (EECF)[2], Process Chlorine Free (PCF) or Totally Chlorine Free (TCF)

ENVIRONMENTAL BENEFITS:
30% post-consumer recycled paper emits approx. 10-15% less greenhouse gases, and saves the equivalent of 4 to 8 trees per short ton.[3]

ENVIRONMENTALLY IMPROVED PAPER

Meets the minimum criteria below and at least 50% of fiber has environmental attributes

MINIMUM CRITERIA:

- Minimum 30% post consumer recycled
- FSC certification required on papers with more than 50% virgin content
- No controversial sources[4/5]
- Enhanced Elemental Chlorine Free (EECF)[2] Processed Chlorine Free or Totally Chlorine Free (PCF or TCF)

ENVIRONMENTAL BENEFITS:
50% post-consumer recycled paper emits approx. 19-25% less greenhouse gases, and saves the equivalent of 8 to 13 trees per short ton.[3]

ENVIRONMENTALLY SUPERIOR PAPER

Meets the minimum criteria below and all fiber (100%) has environmental attributes

MINIMUM CRITERIA:

- Minimum 50% post consumer recycled
- Virgin fiber can not have controlled wood content[6] or controversial sources[5]
- Processed Chlorine Free or Totally Chlorine Free (PCF or TCF)

ENVIRONMENTAL BENEFITS:
100% post-consumer recycled paper emits 25-50% less greenhouse gases, and consumes no trees.[3]

CLEANER PRODUCTION is also a key element in environmental paper and while there are many variables, the Paper Steps focuses on bleaching technologies in its Minimum Criteria.

What's in Your Paper?
presented by environmental paper network

To find a list of Environmentally Improved and Environmentally Superior Papers visit **www.WhatsInYourPaper.com.**

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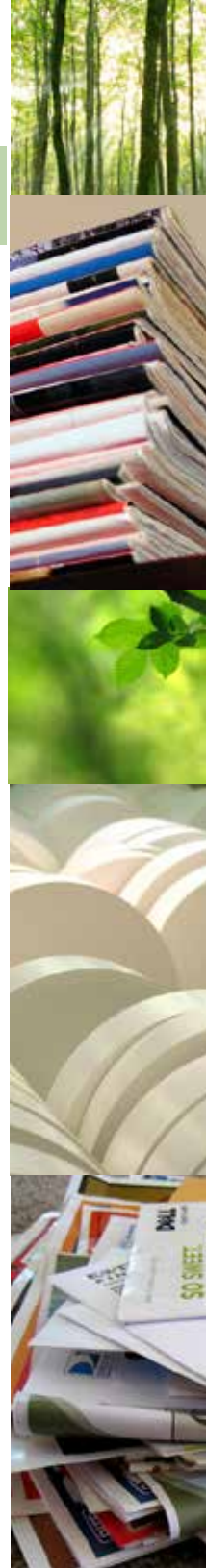





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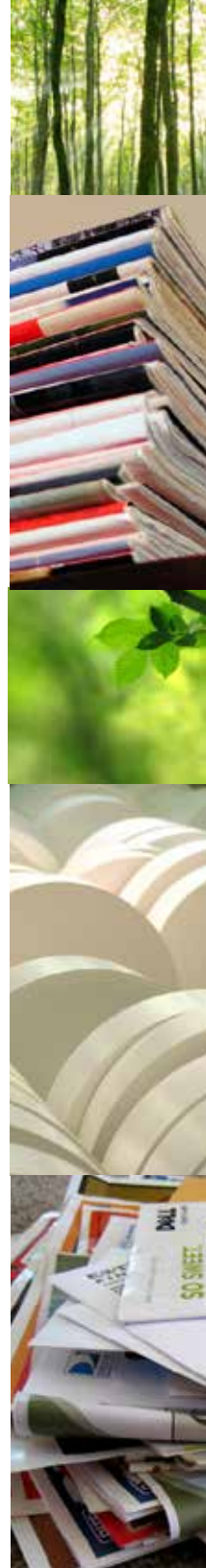





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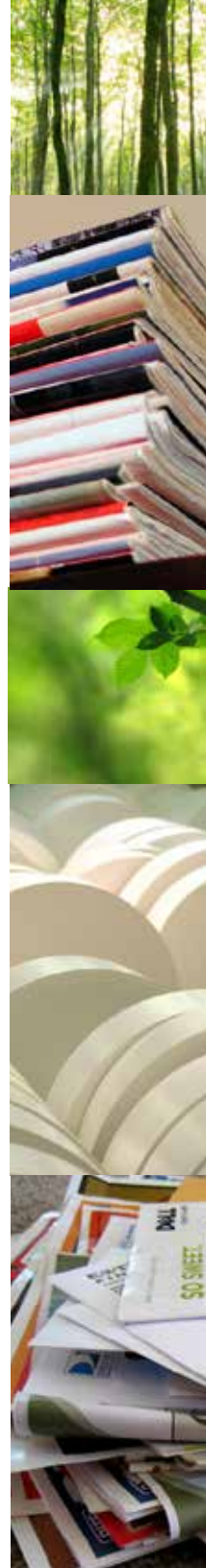
III. SUCCESSFULLY INCLUDING RECYCLED PAPER IN MAGAZINES

87 The Green America Better Paper Project surveys and communicates with magazine publishers and approximates that of the 17,000 US titles only two-percent of publications use recycled paper regularly – or more than just an occasional "green" issue. For a partial list, visit http://betterpaper.ning.com/page/better-paper-magazine-members (accessed 5/1/12)







88 According to The Wye Group, components of an Endangered Forest include: 1) Intact forest landscapes; 2) Remnant forests and restoration cores; 3) Landscape connectivity; 4) Rare forest types (composition and structure); 5) Forests of high species richness (alpha and beta diversity); 6) Forests containing high concentrations of rare and endangered species; 7) Forests of high endemism; 8) Core habitat for focal species (aquatic and terrestrial); 9) Forests exhibiting rare ecological and evolutionary phenomena.

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IV. CHALLENGES TO SUCCESS

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CONCLUSION: GREEN IN ALL GRADES

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OUR VISION is a paper production and consumption economy that repairs, rather than damages, our environment while creating sustainable jobs for the community.

OUR MISSION is to foster collaboration between paper manufacturers, merchants, investors, businesses, nonprofits, and consumers to achieve our vision and encourage the production of socially and environmentally responsible paper—Better Paper.

OUR OBJECTIVE is to work with magazine industry stakeholders to communicate their green intentions to their supply chain by implementing environmental stewardship policies and purchasing practices.

WHAT WE MEAN WHEN WE SAY GREEN At **Green America**, we define "green" beyond solely a concern for the environment. Critical to our mission is to convey that green brings everything together. We live in the "and." Economic ***and*** social justice. Environmental ***and*** community health. People ***and*** planet.

To achieve a truly green America requires a biodiversity of solutions. Toward this end, we mobilize people in all their economic roles: as consumers, workers, business leaders, and investors. We tackle climate change, build fair trading systems, stop corporate abuse, support local community investment, and help dedicated green businesses emerge and thrive. This holistic approach is essential to our mission and our identity.

Green America
COME TOGETHER

Our Better Paper Project is an important part of our effort to achieve a truly **Green America.**