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Paperwork:

Comparing Recycled to Virgin Paper

Why Recycled Content is Crucial for Printing & Writing Paper

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Susan Kinsella is Executive Director of Conservatree, www.conservatree.org. Conservatree is an environmental nonprofit organization dedicated to providing practical tools, technical assistance and realistic strategies for successful environmental paper purchasing and market development. It was founded in 1976 as the for-profit Conservatree Paper Company, the paper merchant that partnered with manufacturers to jump-start the markets for recycled paper in North America. Conservatree introduced the first recycled versions of almost all the printing & writing grades, including the first recycled content copy paper. It ended paper sales in 1994 and converted to a nonprofit education and advocacy organization in 1998. In 2002, Susan Kinsella initiated the founding of the Environmental Paper Network (EPN) and continues to serve on its Steering Committee.

The Environmental Paper Network, www.environmentalpaper.org, accelerates environmental transformation in the pulp and paper industry through coordination and collaboration of a strong and diverse coalition of nonprofit non-governmental organizations.

This White Paper was produced in collaboration with EPN's **RePaper Project**, which includes representatives from Canopy, Conservatree, ForestEthics, Green America, National Wildlife Federation, and the Natural Resources Defense Council.

1. Which is better to use: Recycled paper or Virgin paper?

Fundamentally, the answer is easy. The Environmental Paper Network's Paper Calculator shows clearly that it's better for the environment to use recycled paper than virgin paper, for all paper grades. The following example shows the environmental benefits of using recycled copy paper rather than virgin copy paper.

Virgin Fiber vs. Recycled Copy Paper[1]			
	1 ton virgin fiber paper	1 ton 100% recycled paper	Environmental Savings from Recycled Content
Trees	24 trees	0 trees	100%
Energy	33 million BTUs	22 million BTUs	33%
Greenhouse Gases Released - CO_2 equivalent	5,601 pounds	3,533 pounds	37%
Wastewater	22,853 gallons	11,635 gallons	49%
Solid waste	1,922 pounds	1,171 pounds	39%

In fact, it is still the case that the paper that provides the most environmental benefits, that saves the most resources, that avoids the most toxics and pollution, is paper with recycled content.

But some argue that other considerations change the equation. They question whether there is enough recovered fiber available to make the pulp, or whether the recycling or bleaching chemicals are bad for the environment, or whether it is better to use recycled fibers in some products but not in others.

Some question whether recycling really reduces demand on forests, whether the energy used to collect used paper for recycling outweighs any saved in making recycled products, and whether just using sustainably harvested wood is sufficient.

All good questions. We'll answer them here.

2. Why use recycled fiber?

Billions of people in the world are just beginning to have access to paper and paper products that North Americans have taken for granted for more than a century. While their simultaneous embrace of the digital world will change what kinds of papers proliferate, it is clear that global paper manufacturing is still on a trajectory of rapid and phenomenal production growth.

This might seem far-fetched to North Americans, where the paper industry is in depressing decline. But developing countries are rapidly building paper industries that increasingly serve North American paper needs as well as their own. China's paper use has already shot past that of North America and is still rapidly growing. India is just beginning to build up its paper industry.

But traditional paper manufacturing, especially that relying on virgin wood fiber, creates major environmental burdens, including the overuse of natural resources, production of greenhouse gases, release of toxic emissions, impacts on regions and communities, disposal of waste, and much more. For example, the paper industry is the largest user per ton of product of industrial process water in the U.S.[2] Its use of 12% of total manufacturing energy leads to its U.S. ranking as the fourth largest emitter of greenhouse gases among manufacturing industries, contributing 9% of total manufacturing carbon dioxide emissions.[3]

Meeting the burgeoning global demand with conventional manufacturing processes will only increase the enormous and unsustainable environmental costs. What is required, instead, is a thorough rethinking and transformation of paper production in order to transition into the environmentally sustainable manufacturing processes crucial in this 21st century.

The key to supplying paper sustainably on such an unprecedented scale relies on minimizing paper's production footprint as much and as rapidly as possible. Only recycling and buying recycled content paper can comprehensively reduce the most environmental demands at the same time.

Using recycled content produces the most rapid and comprehensive reduction in the paper manufacturing footprint.

3. Criticisms

So why are there still criticisms suggesting that recycled paper is not a good environmental choice? Some come from lack of understanding the paper industry, especially how manufacturing different types of paper (e.g., printing paper compared to packaging compared to newsprint) results in wide variations in recycling and production realities. Some assume that all paper mills are the same, when there are significant differences even between mills that make the same types of products. Some blame recycling for problems created by other production systems, such as the current fossil fuel-based national energy grid. Some come from companies promoting their own products, in hopes they won't have to change. Recycling requires investments that North American paper mills would prefer to avoid.

Paper is so universal that, at first, people tend to assume it's simple. But it can quickly appear complicated when critical arguments are made in technical language, leaving confusion and uncertainty about what to believe. Following are no-nonsense and important factors to consider in choosing the most environmental paper for your use.

4. Steps To Choosing Environmental Papers

A. Compare Apples to Apples: Evaluate Environmental Impacts of Recycled and Virgin Papers Within the Same Grades

The paper industry makes many different kinds of products, including printing & writing papers, tissue products, newsprint, corrugated boxes, paper bags, stiffening boards, paperboard packaging, and more.

Production for each of these types of products has significant differences from the others. They use different pulping processes and favor different types of fibers, depending on the kind of product they manufacture. Some can cogenerate a portion of their energy while others must purchase all of it. When recycling, each requires a different mix of recovered fibers for recycling, some employ sophisticated deinking processes while others do not, some compete with exports to China for their recycled content while others have less impact, some typically use high recycled contents while others use less or none, some are much more likely to be subsequently recycled than others.

Because of these differences, choices must be compared to parallel options, within the same product category. Comparing environmental impacts between product categories, such as between printing & writing papers and packaging, results in misinformation.

Some argue that it's best to leave recycled content out of some product categories and, instead, put it all into packaging grades, some of which can accept a wide, unsorted mix of recovered fibers.

But some product types, such as printing & writing papers, produce the greatest environmental damage of all grades in the process of their manufacturing, including higher energy and water use, as well as greater greenhouse gas releases. Printing & writing grades also make up a significant portion of the industry's production (far more than newsprint or tissue, even combined) in North America. Therefore, this is where adding recycled content can do the most good for the environment because it can avoid so much of this negative impact, plus it returns resources to the manufacturing process rather than wasting them.

Further, paper markets are complex. If more buyers demand recycled paper, this doesn’t necessarily mean there is less for everyone else. Increased demand may instead drive increases in the amount of recovered fiber collected, and can help ensure that mills relying on recovered fiber have enough to stay in business. Even now, many recycling sorting facilities can and do source and segregate suitable high grade fiber if they have a market for it. Without those markets, that same fiber blends into the crush of mixed paper destined for lower paper grades.

Q: It takes more chemicals to make recycled printing & writing paper than to make recycled corrugated or paperboard packaging. So doesn't it make more environmental sense to save the recovered fiber to make packaging?

A: Are you planning to buy cereal boxes to run through your copier? Are you planning to print your magazine on corrugated boxes? If the answer is no and you plan to buy virgin paper for those uses, then you'll be using paper that results in the greatest costs to the environment. Why wouldn't you choose to reduce these greatest negative impacts – which you can easily do by buying recycled content printing & writing paper? That's the paper category where we can make the most environmental improvements.

If you're also buying packaging, by all means, buy recycled content packaging as well. But a major purchaser of printing & writing grades of paper can create the greatest environmental benefits by choosing recycled content products for those papers.

Bottom Line: Choose the most environmental option within the grade of paper you plan to use.

B. Determine the Most Environmental Fiber Source

Separating the fibers for papermaking takes far more resources when derived directly from trees than when recovered from recycling. On average, more than four tons of trees are required to make one ton of chemical pulp for virgin copy paper. Half the weight of trees is water and less than half the weight of dried trees results in papermaking fiber.[4]

Finished paper includes approximately 15% non-fiber ash.[5] Even so, 1.4 tons of recovered paper can produce a ton of deinked pulp for recycled paper,[6] resulting in a far more efficient use of forest resources than pulping from trees.

Recycled fibers shrink the production footprint right from the very beginning, at the source. The following table compares fiber efficiency for three kinds of pulping used in printing & writing papers.

Comparison of Papermaking Fiber Efficiency[7]		
Type of Pulp	Volume of Required Material to Produce One Ton of Pulp	Efficiency
Virgin Chemical (Kraft)	4.4 tons of fresh trees	23%
Virgin Mechanical (Groundwood)	2.2 tons of fresh trees	45%
Recycled Kraft	1.4 tons recovered paper	71%

Q: Why does it matter how many trees are used, since they are constantly renewable?

A: Don't lose the forest for the trees. While individual trees can regrow, recreating a healthy, fully-functioning forest is much more elusive. Many harvested forests are replaced with tree plantations. This means cutting a forest that had previously been a biodiverse area with a wide variety of trees, plants, animals, birds, insects, soils and water conditions and replacing it with a monoculture crop of trees, often removing many different species in the process. Even when forests are allowed to regrow more naturally, the resulting second- and third-growth trees are far inferior in both size and quality to the original trees that they replace.

Recycling significantly extends the useful fiber life of trees (as well as fibers from plants, when those are used for papermaking). Since the fibers for some kinds of papers, such as printing & writing, can be recycled seven or more times, a tree that is used for papermaking is most efficiently and fully used when those fibers are recycled as many times as possible. That also reduces the need to cut new trees for papermaking.

C. Consider Where the Fiber Comes From

Wood fiber comes from forests or tree plantations, or sawmill operations related to them. In Canada, 90% of the timber harvest comes from old-growth and primary forests.[8] Certification that the trees were sustainably harvested is essential to prevent destruction of old-growth and high-value forest areas. Currently, environmental experts consider the Forest Stewardship Council (FSC) certification to be the most robust and comprehensive.

But certification only assures the source for the wood fibers. If the product does not also include recycled fiber, the resulting paper is still virgin paper, without any of the other environmental savings available through including recycled content, such as reduced energy and water use, greenhouse gases and pollution. It's important when choosing paper to ensure that any virgin fiber is FSC-certified, but it's even more important to maximize recycled content first.

Mills that use recovered fiber need different types, depending on the products they make. Some, such as deinking mills that supply pulp to printing & writing mills, need clean high-grade paper sources from offices and printers. They cannot use newsprint or boxes, which are considered contaminants in their process. Newsprint mills want old newspapers, but cannot process brown corrugated boxes. Some types of mills making paperboard packaging can take a wide mix of unsorted papers, including boxes, but their machinery and production are damaged by poorly sorted materials that include glass and plastics.

Some people are concerned about whether there is enough recovered fiber to support inclusion in all our domestic paper products. In 2011, 42% was exported to paper mills in China and other nations.[9] But the recycling mills in China primarily make newsprint for their own population and packaging to export products to their trading partners, including those in North America. Up until very recently, almost all their printing & writing papers, both as unprinted paper and as finished products such as books, office products and school papers, have had no recycled content. Even projected new deinking capacity is expected to primarily produce papers in only narrow segments of the markets.

While the used office papers that printing & writing paper mills need for their recycled content pulp frequently end up in bales of mixed papers for export, recycling centers with contracts to supply domestic mills can and do sort them out properly. Also, office paper collection has the most room to grow. Some recovered paper categories such as newspapers and corrugated boxes are collected at very high rates, over 75%. But nearly half of used office papers are still uncollected and sent to landfills or incinerators.[10] More and better office and commercial recycling programs could open up as much as 9 million tons of high grade recovered fiber suitable for high quality recycled papers in North America.[11] In turn, increased demand for paper made from

recovered office papers, such as recycled content copy or magazine paper, can help to spur more collection of used office papers.

Q: But isn't it impossible to use only recycled content? Don't the fibers get too short to use in remanufacturing?

A: It's true that papermaking needs some continual infusions of new virgin fibers because recycled fibers eventually fray and shorten from repeated use. Buying papers with 100% recycled content is not a problem; papers made today with 100% recycled fibers are high quality. The concern is with expecting the whole papermaking system to use only recycled fibers, but that is an extreme that no one advocates.

The reality is that less than 10% of today's overall printing and office paper fibers come from recycled sources.[12] That could rise to well over 50% overall and still ensure high quality papers. So we are nowhere near using "too much" recycled fiber in printing & writing papers. Plus, any virgin fibers needed could come from environmentally sustainable nonwood sources. At the very least, they should come from FSC-certified forests.

So help protect resources and the environment by buying paper with high recycled content, especially printing and office papers.

D. Reducing the Production Footprint

For the type of product you intend to buy, which production processes result in the least environmental impacts? EPN's Paper Calculator compares the impacts of recycled and virgin versions of many different paper products.

1. Energy

Many in the paper industry claim that producing virgin paper is more energy efficient than producing recycled paper. In fact, some mills claim they don't use any energy at all. Don't be fooled. This is a complex issue, but the bottom line is that producing recycled Kraft pulp uses 33% less energy overall, on average, than mills making virgin chemical pulp.

So why are there contrary claims? The chemical (Kraft) pulping process results in very strong papermaking fibers, but only half of a dried tree consists of fibers (one-quarter of a fresh tree, half of which is water). The rest of that dried tree is sent as part of a waste product, called "black liquor," to use for cogenerating energy. Some mills don't count this as part of their energy requirements, even though it is essentially creating energy from trees. Not only do virgin paper mills require more energy (primarily for pulping) than recycling mills, but the virgin mills also release 37% more greenhouse gases.

Some argue that recycling mills use more fossil fuels than virgin pulp mills because they must buy their energy from the grid. That is because recycling mills don't produce wood waste like black liquor to burn onsite. But using fossil fuels is not an inherent requirement for making recycled paper. Rather, it is a criticism of a different system, the sources for the national energy grid. As those sources become more renewable, they will fuel recycling manufacturing just as well as the currently unsustainable fossil fuels.

Indeed, several forward-thinking recycled paper manufacturers already invest in renewable energy sources (such as windpower) in order to speed up the development and availability of renewable energy, even when their own mills do not yet have access to them.

Q: Surely, though, the amount of transportation required to collect and deliver recovered fiber uses much more energy than any savings generated by manufacturing.

A: First, remember that, even though it occurs in remote regions and you may not often see it, trees are shipped long distances before they get to sawmills and pulp mills. Second, numerous studies have calculated the transport shipping into the energy equation and found that recycled paper production still requires considerably less overall energy than producing virgin paper. The Paper Calculator includes transportation in its energy calculations.[13]

Q: Isn't it simpler to create energy by burning recovered paper in waste-to-energy plants instead of recycling it?

A: It takes energy to get the moisture out of the paper so that it will burn. But worse, you lose all the resources that could have been reused many more times, including all the cumulative savings in energy, water, and fiber, as well as the cumulative reductions in greenhouse gases, toxics, pollution and waste that could have been provided by repeated recycling. Converting paper to energy can only happen once – recycling fibers can, if done correctly, be repeated several times before the fibers are too short to be usable, saving environmental resources each time they are recycled. From the perspective of conserving resources, the highest and best use of recyclable paper is to recycle it, not to convert it to one-time energy.

2. Chemicals

Deinking recovered paper to make recycled pulp is primarily a cleaning and mechanical process. It uses soaps, surfactants, and caustics, then pushes the fibers through high-pressure screens and filters to remove non-fiber contaminants. While some of the chemicals used in the deinking process can be potentially harmful if mishandled, they are much safer than the far more noxious chemicals necessary to pulp trees. Recycled newsprint, tissue and printing & writing mills use sophisticated deinking processes to remove inks and colors from recovered paper in order to achieve brighter, whiter fibers. Most other types of mills (e.g. paperboard/packaging) are able to use less complex recycling methods because they do not need to remove prior inks and colors.

In contrast, pulping trees is much more chemically intensive, especially in the Kraft pulping process, where the chemicals are considerably more toxic than those used for deinking.

Recycling continues the benefits of reducing toxic chemical use in other ways, too. For example, because fibers recycled from printing and office papers usually have already been bleached at least once, recycled pulps require far less bleaching than virgin pulps, which must bring their color from the brown of wood to white for printing. In addition to requiring less bleaching overall, recycled pulps are also much more likely to use less hazardous bleaches than those used for virgin pulps.

In fact, many recycled mills producing printing & writing papers, as well as tissue, in North America are processed chlorine free (PCF), meaning that they use bleaching chemicals such as peroxide, ozone and oxygen, with no chlorine chemistries at all in their bleaching process. There are no comparable virgin chemical (Kraft) pulp and paper mills in the U.S. or Canada that are completely chlorine free, despite the fact that chlorine molecules can combine with organic materials in wood to form highly carcinogenic dioxins and furans.

Q: Wait a minute! My paper representative tells me that their paper is "elemental chlorine free." Doesn't that count?

A: Up through the late 1990s, Kraft mills making virgin chemical pulp for printing & writing papers usually used "elemental chlorine," which is chlorine gas. But the combination of chlorine and lignins (cellular glue) in wood produced furans and highly carcinogenic dioxin in the mill's wastewater that was released to adjacent rivers and lakes. Dioxins bioaccumulate up the food chain. In the mid-1990s, the U.S. EPA issued a directive for paper mills making chemical pulp to meet more stringent environmental requirements that ruled out elemental chlorine. Over the next few years, almost all the mills transitioned to bleaching with chlorine dioxide, a chlorine compound that significantly reduces dioxins but does not eliminate them. These mills now call their bleaching method "elemental chlorine free," or ECF, because they are no longer using chlorine gas.

Q: So what should I ask for when specifying environmental papers?

A: The best kind of bleaching is processed chlorine free (PCF), which uses ozone, oxygen and/or peroxide but no chlorine compounds. Many of the recycling mills making printing & writing papers or tissue use this type of bleaching, but not all do. There are also some products that are not bleached at all.

Mills using elemental chorine free (ECF) bleaching may use a range of methods, with some much better than others.[14] Kraft mills that use oxygen delignification can reduce their use of chlorine dioxide, and some use interim steps with non-chlorine bleaches to reduce their use of chlorine dioxide even further. Unfortunately, mills do not publicize the type of ECF bleaching they use, so paper buyers must request that information from the mill itself. Otherwise, they may be led to believe that a mill simply using chlorine dioxide substitution achieves the same environmental benefits as one using the more complex levels.

3. Water Use

Recycled paper mills also require less water to make their pulp than virgin pulp mills. With some geographic areas already experiencing water shortages, and water issues expected to become increasingly problematic in the future, recycling can play a critical role in rapidly reducing this aspect of mill production, as well.

4. Solid Waste

Virgin pulp is made based on a linear model - cut trees, use many resources (energy, water, etc.) to make the paper, send it out for use, dispose of used paper in a landfill or incinerator, then cut more trees and use more resources to make more paper. Some virgin paper manufacturers now try to claim environmental praise by describing their paper as "recyclable," meaning that it could go into the recycling system if desired, but they do not make that effort themselves.

Recycled pulp, on the other hand, is made based on a circular model - gather used papers, deink and repulp them, use fewer resources to make new paper, distribute for use and then collect used paper through recycling programs to process again into new paper. Recycling keeps the paper out of landfills, preventing its contribution to creating methane, a climate change gas 25 times more potent than the carbon dioxide used to measure greenhouse gases (GHGs). Recycling also keeps the paper out of incinerators that burn resources that could have been used many more times.

Q: But I hear that recycling results in a great deal of sludge. That must be bad for the environment.

A: All mills produce some sludge, and deinking mills produce more than virgin mills because deinking leaves a residue mixture of inks, used coatings and fillers, tiny fibers too small to recycle, and contaminants such as staples, glass, plastics and non-fiber materials. But those materials would all have ended up in a landfill or incinerator in any case if the paper had not been recovered to send to a deinking mill. Instead, recycling and deinking provides the best waste management by reusing useful resources while leaving the much smaller amount of unusable material to be safely handled according to government regulations. This is a much more environmentally sound outcome than scattering those materials throughout a landfill where the organic materials can create methane and potentially toxic inks can eventually leach into groundwater. When paper sent to an incinerator is burned, the residues become part of the toxic ash that is then landfilled.

E. Support Environmental Systems

Recycling is a whole system, with elements that all have to work together: collection, sorting, shipping, manufacturing, purchasing the final products, and then repeat. Buying recycled paper supports and strengthens that system, which in turn will support new investments.

It is important to understand that recycling is a *system* necessary for environmental sustainability. It is not inherently a type of wood fiber. The fact that recycled paper today consists almost exclusively of tree fibers reflects only the current state of our paper supply. Whether paper is made from trees, crops, agricultural residues, or other fibers, it needs a system to recycle it after eventual disposal. That system works by including recycled content in the paper.

North American purchasers can influence not only domestic paper production, but also global production when they insist on recycled content. Upgrading recycling and supporting the whole recycling system are the best long-term environmental investments for an expanding paper industry.

Q: But virgin paper can be used to make recycled paper, so why is its production not considered part of the "circular model"?

A: Paper without recycled content does not create the incentives for deinking and recycling investments that are necessary to keep the recycling system functioning. Those incentives are created when recycled fiber is "pulled through the system" by demand for paper with recycled content. Virgin paper can be an input to making recycled paper, but it prioritizes investments in harvesting and pulping forest fiber, not paper recovery and recycling. Recycling is a circular system, and buying recycled is essential to "closing the loop" on this system.

F. Consider the Fate of the Fiber

What happens to the products after they are manufactured and used? Some are collected in curbside recycling systems, others in commercial recycling systems, and some are not collected at all.

For example, if office paper is collected in a clean enough stream to be used for making printing & writing paper, it can theoretically be used seven or more times before it becomes too short for further recycling. Each time it is recycled, it reduces the demand for forest fibers and provides significant savings in energy, water and chemical use, plus reduces climate change gases, toxics, pollution and landfill requirements. Since making virgin printing & writing paper is the most environmentally intensive papermaking process, using recycled content produces the most significant environmental benefits in that process. Currently, nearly half of all North American office paper is uncollected and still available for new recycling collection.[15]

Newsprint is collected at a very high rate, over 75%, but it can be recycled only three or four times, since it is a shorter and weaker fiber. More than 75% of corrugated boxes are also collected, both at retail and commercial sites and in curbside programs, and most go back to be incorporated into new corrugated boxes. Tissue products, which can also incorporate recycled office paper, are not recycled again at all.

Some paperboard boxes (such as cereal boxes) have very high recycled content, often 100%, but many others have none. Paperboard is not always collected in curbside programs and, while those products could be recycled three or four times, they often are not.

What happens when collected paper materials are mixed? Some products, such as the inner fluted layer of corrugated boxes or notepad backings or the stiffening boards in binders, can use virtually any kind of paper fiber in a mixed collection. But other types of products require only specific types of collected papers and cannot use a mix. For example, making office papers or tissue products relies on high-grade sorted recovered paper (like recovered office paper). If, therefore, used office paper is dumped into a mixed fiber collection, it cannot be used for making recycled printing & writing paper, and it can never again be sorted out once it is incorporated into packaging or other mixed fiber products.

Using office paper for making packaging represents an environmental loss. If it had been used instead to make recycled printing & writing paper, it would have produced greater environmental benefits and could have been recycled many more times than

any other fiber. Most packaging products can use such a wide array of recovered fibers that there is no need to divert office paper to them. Plus, packaging tends to be recycled very few times, compared to the high potential for multiple recycling of office and printing paper fibers.

So buying office papers made from recycled content is a critical way of ensuring that the high-grade fibers used in office paper production can return to the manufacturing system multiple times, resulting in maximum environmental benefits.

Tissue production uses the same type of pulping as printing & writing papers, although it allows a bit more leeway to use some sources such as shredded papers and some newsprint. While tissue is a good destination for recovered fiber because its products are so short-term, it cuts short the potential multiple lifetimes of the recycled fibers because it is not subsequently recycled. The tissue markets are also just a fraction of the printing & writing paper markets, even with the current reductions in paper use. So recycled content is necessary in printing & writing paper production to reduce this paper grade's much greater potential for environmental damage.

V. The Bottom Line

Recycled content is the best overall environmental choice. For paper buyers deciding whether to choose recycled paper, it is essential to compare recycled and virgin within a category, rather than to products outside it. The fact that some other kind of paper product might require no bleaching or less processing is beside the point. What is most important is reducing the environmental impacts of the grade of paper you intend to buy.

Q: Does that mean buying recycled is the only environmental attribute that matters?

A: Recycling should be the foundation because it minimizes the paper production footprint in so many ways at once. But, in addition, after maximizing recycled content, virgin fibers should be credibly certified as sustainably harvested, all fibers should be non-chlorine bleached, agricultural residues and sustainably grown nonwood fibers should be encouraged, and renewable energies should be developed. Each of these attributes of paper production has plenty of important dimensions to explore as well. But those need discussion papers of their own to do them justice.

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[3] Environmental Paper Network, *The State of the Paper Industry: Monitoring the Indicators of Environmental Performance,* 2007 and *The State of the Paper Industry 2011: Steps Toward An Environmental Vision*
[4] Newsprint, using a different pulping process, is far more efficient, using half as much wood but producing a less durable type of paper.
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