

Q & A on the Environmental Benefits of Recycled Paper

By Environmental Defense and the Alliance for Environmental Innovation

Q Is recycled paper better for the environment than virgin paper?

A Yes! It's common sense that making new paper from old paper is easier on the Earth.

Here's why:

- It helps preserve forests, because it reduces demand for wood;
- It conserves resources and generates less pollution during manufacturing, because the fibers have already been processed once; and
- It reduces solid waste, because it diverts usable paper from the waste stream.

Rigorous scientific research supports the benefits of recycled paper, and government agencies, environmental groups, and many other large purchasers have adopted policies mandating its use. You can be assured that you are doing the right thing for the environment by buying recycled paper, and the higher the level of postconsumer recycled content, the better. Read on for answers to more specific questions about why recycled paper is the right choice for the environment.

How Paper Recycling Benefits Forests



Incorporating recycled fiber reduces the amount of virgin fiber (i.e., trees) needed to produce a given amount

of paper. This helps to reduce pressure on forests and the environmental impacts of commercial forestry.

Q Does paper recycling save trees?

A Recycling reduces the total number of trees that are cut down to make paper and can reduce overall demand for wood. But more importantly, paper recycling saves forests. By substituting used paper for trees, recycling reduces the overall intensity of forest management needed to meet a given demand for paper, and the pressure to convert natural forests and ecologically sensitive areas like wetlands into tree plantations. With recycling, not only will fewer trees be harvested to make paper, those trees that are harvested can be produced using methods that have less

impact on the environment. Thus, recycling helps preserve the full range of values that forest ecosystems provide, including clean water, wildlife habitat and biodiversity.

Q Doesn't the paper industry replant more trees than it cuts down?

A Generally yes, but replanting trees is not the same thing as preserving forests. Growing demand for paper has fueled the rapid conversion of natural forests to tree plantations. In the U.S. South, where most of the trees used to make paper are grown, the area of natural pine forest declined from about 72 million acres in 1953 to 33 million acres in 1999. During the same period, pine plantations grew from 2 million acres to 32 million acres, and are projected to reach 54 million acres in 2040, in large part at the expense of natural forests. While pine plantations are excellent at growing wood, they are far less suited than natural forests to providing wildlife habitat and preserving biodiversity. By extending the overall fiber supply, paper recycling can help to reduce the pressure to convert remaining natural forests into tree farms.

Q Do the young trees in plantations consume more carbon than older trees?

A If you're concerned about climate change, you want older forests, not younger ones. While younger trees may *absorb* carbon more rapidly, older trees *store* vastly more carbon, thereby reducing concentrations of greenhouse gases in the atmosphere. Moreover, every time trees are cut down for paper, much of the carbon they have stored is released. By reducing the demand for virgin fiber, recycling can reduce the frequency at which trees are cut and increase the total stock of carbon in forests. Recycling also helps maintain the stock of carbon stored in paper by reusing it multiple times, instead of allowing it to decompose in landfills and produce methane, a potent greenhouse gas.

Q Do younger trees release more oxygen than older trees?

A There is plenty of oxygen already in the atmosphere, so this is not an environmental concern. If it were, older trees would still be preferred to younger trees, since they release much more oxygen over their lifetime, even if the rate slows as they age.

How Paper Recycling Reduces Pollution During Manufacturing



Making paper from used paper is generally a cleaner and more efficient process than making paper from trees, since

much of the work of extracting and bleaching the fibers has already been done. That means less total energy, water, and chemical use, and lower releases of air and water pollutants.

Q Which takes more energy to produce, recycled or virgin paper?

A Producing recycled paper uses much less total energy than producing virgin paper.

Depending on the grade, producing recycled paper may use more or less *purchased* energy (a subset of total energy), in the form of fossil fuels and purchased electricity. Virgin freesheet grades require slightly less purchased energy to produce than recycled ones, because some of their energy needs are met by burning wood-derived process waste. Virgin groundwood papers, by contrast, require *more* purchased energy to produce than do recycled groundwood papers.

Q Is it better to use wood as an energy source rather than fossil fuels?

A Both energy sources have significant—if different—environmental impacts. Extraction and use of fossil fuels for energy depletes a non-renewable resource and releases air pollutants and greenhouse gases. But there are analogous impacts associated with extracting and using wood for energy.

First, growing and harvesting trees can deplete a non-renewable resource—natural forests. As noted above, intensive management prac-

tices used to grow trees for paper—including both the part of those trees that goes into the paper itself and the part that is burned for energy—can adversely affect water quality, biodiversity, habitat for endangered plants and animals, and the integrity of natural forest ecosystems. Thus, while intensive management can arguably regenerate the quantity of wood, it cannot renew many of the ecological values of natural forests.

Second, burning wood for energy creates air pollution just as burning fossil fuels does. On a lifecycle basis, when all energy sources are considered, releases of air pollutants are generally much lower for recycled than for virgin paper.

Third, even when recycled paper production uses more fossil fuel than its virgin counterpart, on a lifecycle basis the recycled system generates fewer greenhouse gas emissions—see next question.

Q How does switching to recycled paper reduce greenhouse gas emissions?

A The environmental advantages of recycled paper hold true even when more fossil fuel-derived energy is used to produce it. (As noted above, this is true only for freesheet grades.) In the landfill, where 80% of discarded paper ends up, the decomposition of paper produces methane, a greenhouse gas with 21 times the heat-trapping power of carbon dioxide. Paper recycling recovers used paper from the waste stream, directly reducing the amount of paper landfilled. Thus for recycled papers, any increase in greenhouse gas emissions during manufacturing is more than outweighed by reductions in emissions from landfills.

Q Given that paper mills are typically located near forests and far from sources of wastepaper, what about the energy needed to transport recovered paper to mills?

A Lifecycle analysis shows that even after the energy used to collect, transport, and process

used paper is accounted for, the recycled paper system uses much less total energy than the virgin paper system. This is because the energy needed to recover used paper and get it back to the mill is quite small relative to the energy saved by using recovered paper rather than trees to manufacture new paper.

Don't forget that making virgin paper also requires energy to cut, collect and transport trees to the mill, all of it fossil fuel-derived. And while the distances are shorter, the magnitude is greater - between 2.2 and 4.4 tons of wood are cut and transported for every ton of virgin pulp, versus 1.4 tons of waste paper for a ton of recycled pulp. Thus, the energy required to obtain and process trees (for virgin paper) and used paper (for recycled paper) is quite comparable.

Q What other manufacturing impacts are reduced by switching to recycled paper?

A Aside from reducing total energy use and greenhouse gas emissions, switching to recycled paper cuts emissions of other air pollutants such as nitrogen oxides (which contribute to smog), and particulates (which contribute to respiratory problems). It also reduces the volume and improves the quality of wastewater from the paper mill.

Q Why does wastewater volume matter?

A Wastewater volume is a meaningful environmental measure, as it indicates both the amount of fresh water needed in production and the potential impact of wastewater discharges - that's why it's often regulated. The withdrawal and return of large amounts of water from rivers and streams can have major ecological impacts, which are made even worse at drier times of year and during droughts. And even treated wastewater carries with it various process-related pollutants. Our side-by-side comparison found that on average, virgin paper production requires substantially more water and yields wastewater that has significantly higher levels of major water pollutants than does recycled paper production.

Q What about the sludge from recycled paper mills?

A Recycled mills do generate more solid waste, mostly in the form of sludge, than virgin paper mills. However, that increase is more than offset by the reduction in solid waste that comes from diverting paper from the waste stream. And the same inks, coatings, and fillers present in recycling mill sludge would go into the ground anyway if the paper were landfilled instead of recycled. Finally, recyclers are increasingly finding ways to reclaim and reutilize some components of recycled paper sludge, which can't happen if that paper goes to a landfill or incinerator.

Q Aren't pulp and paper mills much cleaner than they used to be?

A Many are, thanks to environmental regulations implemented during the last several decades. They would be even cleaner if they increased their use of recycled fiber.

available fiber supply, paper recycling conserves wood and other forest resources, and reduces environmental impacts (energy use, air and water pollution, and solid waste) during manufacturing. Finally, by reducing paper's contribution to landfills, recycling avoids releases of methane and other pollutants, and reduces the need to site additional landfills where such releases would occur.

Q Why are methane releases from landfills an environmental concern?

A Methane, a gas with 21 times the heat-trapping power of carbon dioxide, is a potent greenhouse gas and contributor to global climate change. The U.S. EPA cites municipal landfills as the single largest source of methane emissions to the atmosphere, and has identified the decomposition of paper as among the most significant sources of landfill methane.

Q If recycled paper is ultimately landfilled, how does recycling reduce solid waste?

A Each time paper is diverted from the waste stream and used to make recycled paper, there is a direct reduction in solid waste. Think of it this way - if you use a piece of paper once, then erase and use it again before throwing it away, you create less waste than if you used two pieces of paper and threw them both away. Similarly, even if a sheet of recycled paper is eventually landfilled, the recycling process still reduces the total amount of paper landfilled.

include trim and scrap from manufacturing processes (e.g., the conversion of paper rolls into envelopes) and overissue publications. Unlike preconsumer fiber, postconsumer fiber is not typically included in paper at any significant level unless purchasers specify it. Buying paper with postconsumer recycled content achieves direct reductions in wood, water, and total energy use, releases of pollutants during manufacturing, and solid waste and greenhouse gas emissions from paper decomposing in landfills. It also supports business and community recycling programs, and creates an incentive for paper manufacturers to use more paper diverted from disposal.

Q What's so great about 10% postconsumer recycled content in catalog paper?

A Most paper called "recycled" is made from a blend of virgin and postconsumer fiber. Right now, due to functional and economic issues (including lack of demand) the most widely available and cost-competitive level of postconsumer recycled content in catalog paper is 10%. Given the amount of paper that the catalog industry uses (3.6 million tons in 2001), even a switch to 10% yields big benefits, and is a critical first step to achieving higher levels in the future. Obviously, the higher the postconsumer recycled content, the bigger the environmental benefits.

Q Is it worth all the effort, if the percentage of recycled fiber that would end up in catalog paper is so small?

A It's easy to claim that because one is only a small part of the problem, it's not worth being part of the solution. Such an attitude accomplishes nothing, and in the case of the catalog industry, has no basis in reality. The catalog industry used 3.6 million tons of paper in 2001 - 12% of all printing and writing paper consumed in the United States. Obviously, if such large purchasers started specifying recycled paper, there would be a substantial increase in used paper recovery.

How Paper Recycling Reduces Solid Waste



Recycling paper means that less of it is disposed of in landfills and incinerators. This

lowers air and water pollution at these facilities, as well as greenhouse gas emissions that arise when paper breaks down in landfills.

Q Don't we have plenty of landfill space? If so, why recycle paper?

A The environmental advantages of recycling extend well beyond saving landfill space, which varies cyclically as well as regionally across the United States. Paper recycling also reduces environmental impacts "upstream," in the forest and at the paper mill. By adding to the

Other Questions About Recycled Paper

Q What's the difference between postconsumer and preconsumer recycled content?

A *Postconsumer* materials are finished products that have served their intended end use and would otherwise end up in a landfill or incinerator. *Preconsumer* materials

But increasing the recovery rate is a secondary concern. What should be foremost in the minds of paper users are the environmental benefits of switching to recycled paper. If the entire catalog industry switched to just 10% postconsumer recycled paper, the savings in wood use alone would be enough to stretch a six-foot fence across the United States seven times. Higher levels of postconsumer recycled content will achieve even larger environmental gains.

Q Doesn't it make more sense to recycle all paper by putting it into lower grades of paper instead of printing and writing papers?

A Certainly not from an environmental standpoint. The benefits of substituting recycled for virgin fiber are generally larger in higher grades (especially those made from chemical pulp) than lower grades such as newsprint, corrugated boxes, and tissue. And from a supply perspective, there is more than enough recovered paper to supply recycled pulp for both printing and writing papers and lower grades.

Notes and further reading:

The scientific basis for these conclusions is the analysis of the Paper Task Force, a three-year research project convened by Environmental Defense and involving Duke University, Johnson & Johnson, McDonald's, Prudential Insurance, and Time Inc. The Paper Task Force examined environmental impacts through the full lifecycle of paper, along with economic and functional issues across major paper grades. Its findings were extensively peer-reviewed by scientists, academics, environmental experts, and government and industry representatives.



The full Paper Task Force report, with supporting technical papers and recent updates to the lifecycle environmental data can be found at www.environmentaldefense.org/article.cfm?ContentID=1689.

For more information, see also:

- "Puzzled About Recycling's Value? Look Beyond the Bin." U.S. Environmental Protection Agency, 1998. www.epa.gov/epaoswer/non-hw/recycle/benefits.pdf.
- "Recycling ... for the future." Office of the Federal Environmental Executive, 1998. www.ofee.gov/wpr/future.pdf.

THE BOTTOM LINE: BUY RECYCLED.

The environmental impacts of papermaking are undeniably complex, but the basic conclusion is simple: recycled paper is better for the environment than virgin paper. Switch to recycled paper, and use the highest level of postconsumer recycled content you can find. It's the right thing to do for the Earth.



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