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The Sustainability Debate: Paper Versus Digital Communications

There's a lot of lively discussion these days about which is more sustainable – paper or digital communications – with representatives from both camps sharing a host of facts and figures to support their positions. But as technologies and uses of both evolve, it's clear that neither is going to replace the other, so what's the point of drawing lines in the sand?



The truth is that both print and digital media have environmental, social and economic impacts. Some are very positive, some are negative and all are potential targets for improvement.

"When it comes to the environment, improvement begins with sound scientific evaluation," says Verso Paper Corp. Vice President for Sustainability Craig Liska. "To determine how we can best influence environmental performance, we first must identify and measure our impacts. Lifecycle assessment is one of the most effective ways to do this."

Lifecycle assessment (LCA) is a complex and often costly process that looks at where a product's raw materials come from, how the product is made, how it's used and how it's disposed of.

Drawing Valid Conclusions

"To draw valid conclusions in the print versus digital debate we really need to evaluate comparable elements throughout the entire lifecycle of each individual product, a 60-page printed magazine to a 60-page digital version, for example," Liska explains.

Unfortunately, product-level lifecycle comparisons are few and far between. "This is partly due to the commitment of money and other resources required to complete them, but the bigger problem is the lack of international product-level standards to specify boundaries of what should and should not be included in product LCAs," Liska says. "The lack of a paper-related product standard makes apples-to-apples comparisons of one paper product to another difficult, much less paper to digital media. Even so, we cannot put our goal of continuous environmental performance improvement on hold," he says.

Sustainability

Verso's LCA Model

In the absence of a global LCA product standard for paper, Verso decided to move ahead on its own, and with the help of an internationally recognized LCA consultant developed a lifecycle assessment model to measure the carbon footprint of its products. Using this model, one of the most comprehensive developed to date, the company in 2008 completed an assessment of Advocate Hi-Bulk®, one of the grades produced at its Bucksport Mill.

National Geographic LCA

More recently, Verso expanded its LCA model to help one of its top customers, the National Geographic Society (NGS), measure the carbon footprint of its flagship magazine. Supply chain partner Quad/Graphics, which prints *National Geographic* magazine, also participated in the study.

This cradle-to-grave assessment included the harvesting of trees to make the magazine's paper, the paper manufacturing and printing processes, distribution, recycling and disposal.



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The study found that an average 12.3 ounce *National Geographic* magazine with 5% recycled content is responsible for emissions of 1.82 pounds of carbon dioxide equivalents, the greenhouse gases (GHGs) that contribute to global climate change. This amount of emissions is roughly the equivalent of driving a car averaging 20 miles per gallon two miles. While this result is very important, even more valuable is the massive amount of detailed information that was collected and analyzed to come to this conclusion.

"Verso, NGS and Quad/Graphics are using all the information compiled during the study to help us focus more clearly on areas for environmental improvement across *National Geographic's* lifecycle and our operations in general," Liska says.



"The data are also helping us rule out areas where additional effort would not result in much environmental improvement," he says. "For example, data specific to the *National Geographic* LCA showed a negligible increase in GHG emissions when the amount of recycled fiber in the paper was increased from zero percent to 5%, and then to 10%."

The LCA also found that unlike many other publications, most *National Geographic* magazines are archived or recycled rather than discarded into the waste stream. "Rather than being discarded in landfills where they would biodegrade and emit methane, a greenhouse gas, these stored magazines are actually sequestering carbon," Liska says. "This is a perfect example of why lifecycle assessments are critical in evaluating sustainability. The results may not always be what's expected."

The Big Picture

Because LCA data for analogous electronic media are not currently available, Verso's study results can't yet be used for precise paper versus pixel comparisons. They do, however, provide added depth and breadth to paper's overall sustainability story, and it's a good one.

Proponents of the "digital is greener" point of view can't deny that paper is made with a renewable resource while most electronic components are made from non-renewable resources. Another undeniable fact is that both paper and electronic communications require considerable amounts of energy to produce, and energy use is by far the largest contributor to greenhouse gas emissions that define the carbon footprint of both. However, for paper, most GHGs are emitted during the manufacturing process, which is powered primarily by carbon-neutral biofuels. Almost all of the energy consumed by digital

communications results from creating, transmitting and storing data. Most of this energy is purchased from the electric grid which is powered by GHG-producing fossil fuels, primarily coal. And when it comes to recycling, some 57.4% of all paper in the United States is recycled while only 18% of computer products (CPUs, monitors, laptops and other peripherals) are recycled, according to the U.S. Environmental Protection Agency.

"There are many comparisons to be made between paper and electronic communications and regrettably, contentious debate is likely to continue," Liska concludes. "But sustainability is about balance, not competition. Despite all the rhetoric about a paperless society, ink on paper is here to stay," he says. "As both print and digital media continue to evolve in new and exciting directions we need to forego the good-guy bad-guy scenarios, embrace them as complementary forms of communication, and look for ways to make both more sustainable."

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