

# Is Digital Media Worse for the Environment Than Print?



by [Don Carli](#), March 31, 2010

Tagged: [carbon footprint](#), [coal](#), [e-waste](#), [embodied energy](#), [grey energy](#), [mountaintop removal](#), [paperless](#), [print media](#), [sustainable forestry](#)

Public opinion polls show that [concern about the environment rises and falls](#) based on the state of the economy and other factors, but concern about the negative impacts associated with using paper and printing continues to rise. Nothing captures the essence of these feelings more vividly than the signature line appearing at the foot of more and more emails: "Please consider the environment before printing this email."

This seemingly well-intentioned call to action, as well as others like "Sign up for paperless billing, help the environment and save trees" confront consumers with a false dilemma and present a forced choice that may have unintended consequences. The false dilemma is: "By using paper to print your email or by receiving paper bills you are knowingly degrading the environment, destroying forests and/or killing trees." The forced choice is: "Eliminate your use of paper or feel like a guilty hypocrite."



A paper mill in Washington

What's implied is that digital media is the environmentally preferable choice and that print media is the environmentally destructive choice. But is it possible that digital media could be more destructive to the environment and a greater threat to trees, bees, rivers and forests in the United States than paper-making or printing?

A heightened sense of awareness about the environment has developed in recent years. In particular, feelings of guilt and concern are on the rise about the use of paper and its alleged impact on the fate of our trees, forests and the environment. Are these feelings justified?

The story of sustainable media is a "bad news/good news" story. The bad news is that the public's concern about our forests and the environment is justified. The good news is that

seeing beyond the green rhetoric and rethinking the lifecycle impacts of both print *and* digital media will play a major role in allowing us to enjoy forests and conserve our environment.

## Digital Deforestation

There is growing recognition that digital media technology uses significant amounts of energy from coal fired power plants which are making a significant contribution to global warming. [Greenpeace estimates](#) that by 2020 data centers will demand more electricity than is currently demanded by France, Brazil, Canada, and Germany combined. What is less widely known is that mountaintop-removal coal mining is also a major cause of deforestation, biodiversity loss, and the pollution of over 1,200 miles of headwater streams in the United States.

If your goal is to save trees or do something good for the environment, the choice to go paperless may not be as green or simple as some would like you to think.

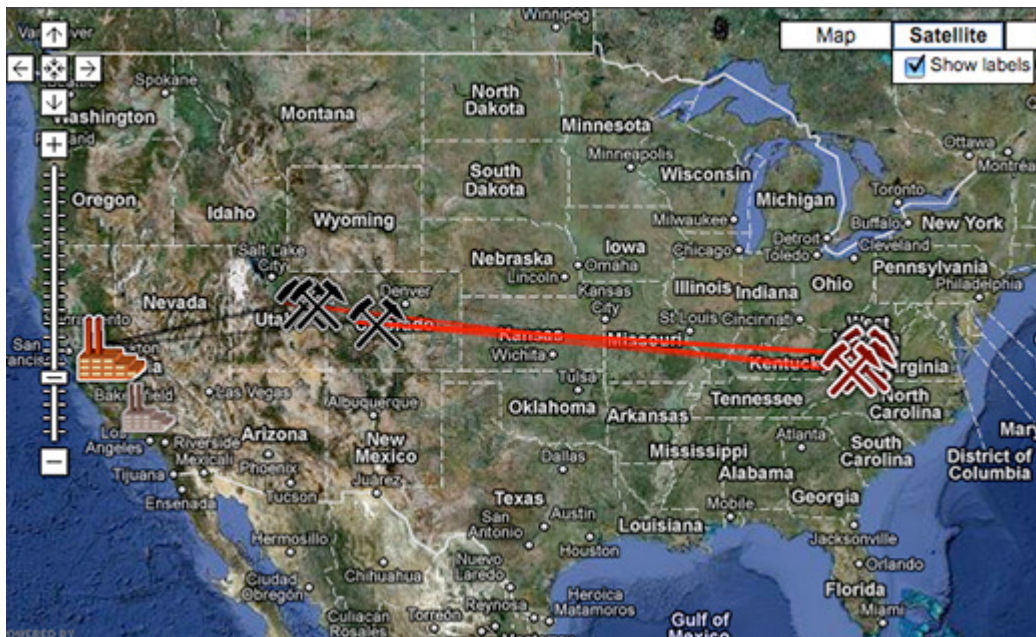
Digital media doesn't grow on trees, but increased use of digital media is having a profoundly negative impact on our forests and the health of our rivers. Computers, cellular networks and data centers are connected to [the destruction of over 600 square miles of forest in the U.S.](#) One of the more significant direct causes of deforestation in the United States is mountaintop-removal coal mining in the states of West Virginia, Kentucky and North Carolina.

America's adoption of networked broadband digital media and "cloud-based" alternatives to print are driving record levels of energy consumption. According to the U.S. Department of Energy, the electricity consumed by data centers in the United States doubled from 2000 to 2006, reaching more than 60 billion kilowatt hours per year, roughly equal to the amount of electricity used by 559,608 homes in one year. According to the EPA that number could double again by 2011.

Chances are that the electricity flowing through your digital media devices and their servers is linked to mountaintop-removal coal from the Appalachian Mountains. The Southern Appalachian forest region of the U.S. is responsible for 23% of all coal production in the United States and 57% of the electricity generated in the U.S. comes from coal -- including the rapidly growing power consumed by many U.S. data centers, networks and consumer electronic devices.

## How Green is Your Digital Media?

To find out how much of the energy you use comes from mountaintop coal you can visit [What's My Connection to Mountaintop Removal?](#) an interactive tool built by the non-profit organization Appalachian Voices. By entering your ZIP code it allows you to see if the electricity you are buying came from a coal mine employing mountaintop removal. This map shows how electricity used in San Francisco through PG&E comes from mountaintop-removal coal in West Virginia:



If you thought you were saving forests and protecting the environment by going paperless...think again. The real dilemma you face is that you may be doing more to cause environmental degradation and deforestation by going paperless than you think, and making responsible choices requires informed decisions and rational tradeoffs.

Coal-powered digital media is destructive to the environment in many ways beyond deforestation. Coal fired power plants are responsible for 93% of the sulfur dioxide and 80% of the nitrogen oxide emissions generated by the electric utility industry. These emissions cause acid rain that is destroying red spruce forests in the Northeast and Appalachia, and killing brook trout and other fish species in the Adirondacks, upper Midwest and Rocky Mountains.

According to [a paper published in the journal Science](#), researchers found that recent scientific studies showed mountaintop coal mining does irreparable environmental harm. The researchers said their analysis of the latest data found that such mining destroys extensive tracts of deciduous forests while also hurting fish and plant life.

The widespread practice of mountaintop removal has been described as "strip mining on steroids" in which forests are clear-cut and topsoil is scraped away. Next, explosives up to 100 times as strong as ones that tore open the Oklahoma City Federal building blast up to 800 feet off the mountaintops and then dump tons of "overburden" -- the former mountaintops -- into the narrow adjacent valleys, thereby creating "valley fills."

The U.S. Fish and Wildlife Service estimates that mountaintop removal's destruction of West Virginia's forests buried over 1,500 miles of biologically crucial Appalachian headwaters streams, disrupted key nesting habitat for migrant bird populations and decreased migratory bird populations throughout the northeast United States. The Office of Surface Mining reports that more than 1 million acres of land in northern and central Appalachia were undergoing active mining operations as of 2004. In some areas of West Virginia, more than 25% of the land surface is under permit for current or future mountaintop removal.

**Go Tell It On The Mountain**

It's somewhat ironic that print media and the paper-making industry are so often targeted for "killing" trees while digital media is so often characterized as the greener "environmentally friendly" alternative. While its record is by no means perfect, the North American forest products industry has made great strides in the adoption of sustainable forestry and environmental performance certification practices. In addition, the majority of the U.S. paper industry's power and electricity needs are derived from renewable biomass that is sourced from sustainably managed forests. On the other hand, digital information technology's dependence on coal-powered electricity that is derived from mountaintop removal goes largely unreported.

If you care about the environment and the health of forests you should become more informed about the energy sources used by both digital and print media. Research recently [published by Bell Labs](#) concluded that today's Information and Communication Technology (ICT) networks have the potential to be *10,000 times* more efficient than they are today. In fact, they can also be powered by [forest bio-refineries](#) that sustainably produce energy, biofuels, polymers, and paper with renewable forest biomass.

Forest biomass can provide valuable baseload capacity for more intermittent renewable energy sources, such as wind and solar. When you purchase paper, you should consider if the brands you buy are investing in the development of renewable energy projects that employ sustainable forest biomass and close-loop water recovery processes that protect the quality of water in our rivers. This [resource guide](#) from the World Business Council for Sustainable Development can help you in choosing paper products.

## The Unseen Impacts of Digital Media

Just because we cannot see something doesn't mean that it doesn't exist. While paper mills emit visible plumes of steam and waste paper can pile up visibly in our homes and businesses, the invisible [embodied energy](#) or "grey energy" used to manufacture digital technologies and the toxic [e-waste](#) associated with electronics are largely out of sight and out of mind, but their impacts can be profound.



E-waste

According to MIT researcher Timothy Gutowski (as [quoted in Low-Tech Magazine](#)), manufacturing a one kilogram plastic or metal part requires as much electricity as operating a flat screen television for 1 to 10 hours. And the energy requirements of semiconductor manufacturing techniques are much higher than that, up to 6 orders of magnitude (that's 10 raised to the 6th power) above those of conventional manufacturing processes. In addition to considering the way digital media can create new possibilities for a better world we also need to consider the less obvious impacts of the purchased energy, embodied energy, dark content and e-waste associated with the growing use of digital media.

## Informed Choices Save Trees

Centuries ago the widespread adoption of paper and printing resulted in a spread of literacy that ended the dark ages, spawned a renaissance and changed our world for the better. Despite these advances, our environment now faces challenges on many fronts that call for a new literacy about the state of the environment and the "hidden" lifecycle impacts of the media choices we make. The widespread adoption of sustainable print and digital media supply chains can change our world again and help us to restore our environment. On the other hand, if we allow ourselves to be misled by false dilemmas or deceived into making unsustainable choices, distal concerns about destruction of the environment and the decline our forests will soon become a harsh and uncomfortable reality.

**See also:**

[Environmental Impact of Newspapers, Books, E-Waste](#)

[Web Leads, Print Pubs Improve Environmental Impact](#)

[Can Coal be Earth-Friendly?](#)

Image of e-waste by [Jason Schlachet](#) via Flickr; image of paper mill by [Vincent Louis](#) via Flickr.

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