

# Computers and the Environment: Minimizing the Carbon Footprint



By Rich Kaestner

Computers can be good and bad for the environment; we can maximize the good and minimize the bad.

When dealing with environmental issues, it's difficult to ignore the computing infrastructure. With an operations carbon footprint equal to the airline industry's, computer energy use is only part of the problem; we are also dealing with the use of natural resources in manufacturing and disposal issues. The life cycle of computers—from their manufacture and operation to their disposal—negatively affects

our environment. However, their negative effects can be minimized, and this same technology can be used to reduce waste in other areas.

To better understand what can be done to reduce the computer carbon footprint at a school or district level, let's look at our options for purchase, energy use, and disposal, followed by some ideas on using computers to reduce waste.

## Purchasing Computers

When it comes to purchasing computers, we need to recognize that not

all desktops, laptops, servers, storage devices, and network equipment are created equal. Manufacturers have been challenged by organizations such as the U.S. Environmental Protection Agency and Greenpeace, along with public pressure and their own ethics, to reduce the toxic content, to use recycled materials, and to incorporate Energy Star power-saving features into their products.

The good news here is that school leaders don't need to do a lot of research to find green computers and suppliers. Vendors who care have sub-

mitted each desktop and laptop model to the EPEAT (Electronic Product Environmental Assessment Tool) green certification process. EPEAT is a system to help purchasers in the public and private sectors evaluate, compare, and select desktops, notebooks, and monitors based on their environmental attributes. (Check [www.epeat.net](http://www.epeat.net) to see how your vendor is doing, and keep an eye out for similar certification announcements for servers.)

### Energy Use

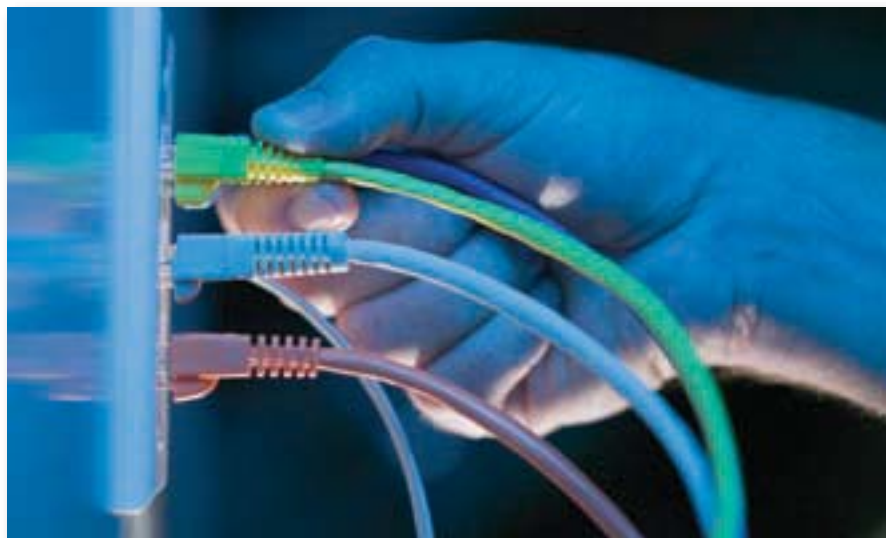
The cumulative power used by computers and supporting infrastructure is significant. When you receive your monthly electric bill, do you just sigh and pay it or do you question what the cost entails? Computer energy use is certainly only one piece of a school's or district's energy bill, but here we will just look at the computer environment.

Before making changes, measure or estimate the energy used by your computing environment. To have a basis for measuring progress, you need to understand your current energy use. Your power company may also give you energy credits in the form of rebates for steps you take to reduce your use of electricity. Check with your electric utility for more information; there are also consultants who can help you with these programs.

Network-based computer applications can help determine computer energy use; or if you are happy with a good estimation, use the Consortium for School Networking's Energy Use Calculator ([www.cosn.org/green-computing](http://www.cosn.org/green-computing)), which is an easy-to-use vendor-neutral energy use estimator for K-12 schools. This calculator allows you to estimate energy use for both the end user and data center (or server closet) in kilowatt-hours and dollars; related data center heating, ventilation, air conditioning, and power supply are also taken into account.

### Computer Disposal

Where do your discarded computers end up? The United States has rather



lax regulations on proper disposal of e-waste. In fact, more than 80% of electronic equipment ends up in landfills as toxic waste, taking up space and leaching mercury and lead into the soil and water supply.

Some organizations will recycle what they can and properly dispose of the rest. Major computer vendors offer programs that they claim as responsible disposal; there are also independent disposal organizations.

While the Environmental Protection Agency offers some help, the grassroots organization Basel Action Network has stepped up to take a tougher stand on the environmental issues of electronics disposal. The Basel Action Network has instituted a program to hold disposers to these more stringent objectives. (Check out its Website <http://e-stewards.org/> for more information on locating a responsible disposal organization in your area.)

Depending on what you are recycling, the first priority should be proper disposal. From there, and depending on what you are discarding, you may spend a little, spend nothing, or receive a small dollar return. In any case, the cost or income is trivial compared with the political value or contribution to our ecology.

### Using Computers to Reduce Waste

To this point, we have discussed minimizing the carbon effect of computers

and related infrastructure. But on the positive side of ecology, computer technology can be used to reduce the school's and district's effect on our environment.

For example, computers can be used to better manage and track overall energy use and building systems' energy controls. They can also be used to reduce student, staff, and support travel through videoconferencing, online learning, online registration, and video streaming. Use your imagination to uncover how technology can replace what is currently being done with energy-intensive school or district programs.

### Getting Started with Green Computing

The Consortium for School Networking provides help to member and nonmember districts and schools to achieve these green computing objectives with its Green Computing Leadership Initiative. (Visit [www.cosn.org/greencomputing](http://www.cosn.org/greencomputing) for more information, including tips, an energy-use calculator, and lots of reference material.)

**Rich Kaestner** is green computing project director for the Consortium for School Networking, headquartered in Washington, D.C. Email: [richk@alyrica.net](mailto:richk@alyrica.net).

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