

# Go Green, Save Green

The Benefits of Eco-Friendly Computing

**APC**<sup>®</sup>  
by Schneider Electric



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# Green Computing Saves Green

*The good news is, by embracing simple, everyday green computing practices, you can improve energy management, increase energy efficiency, reduce e-waste, and save money in the process!*

As computers play an ever-larger role in our lives, energy demands, costs, and waste are escalating dramatically. Consider the following from the Climate Savers Computing Initiative:

- In a typical desktop computer, nearly half the power coming out of the wall is wasted and never reaches the processor, memory, disks, or other components.
- The added heat from inefficient computers can increase the demand on air conditioners and cooling systems, making your computing equipment even more expensive to run.
- Even though most of today's desktop computers are capable of automatically transitioning to a sleep or hibernate state when inactive, about 90 percent of systems have this function disabled.
- Some 25 percent of the electricity used to power home electronics—computers, DVD players, stereos, TVs—is consumed while the products are turned off.

# Four Costly Computer Myths

- 1 You should never turn off your computer.**

Your computer is designed to handle 40,000 on/off cycles. If you are an average user, that's significantly more cycles than you will initiate in the computer's five-to-seven-year-life. When you turn your computer off, you not only reduce energy use, you also lower heat stress and wear on the system.
- 2 Turning your computer off and then back on uses more energy than leaving it on.**

The surge of power used by a CPU to boot up is far less than the energy your computer uses when left on for more than three minutes.
- 3 Screen savers save energy.**

This is a common misconception. Screen savers were originally designed to help prolong the life of monochrome monitors. Those monitors are now technologically obsolete. Screen savers save energy only if they actually turn off the screen or, with laptops, turn off the backlight.
- 4 Network connections are lost when computers go into low-power/sleep mode.**

Newer computers are designed to sleep on networks without loss of data or connection. CPUs with Wake on LAN (WOL) technology can be left in sleep mode overnight to wake up and receive data packets sent to the unit.



## Did You Know...

- An average desktop computer requires 85 watts just to idle, even with the monitor off. If that computer were in use or idling for only 40 hours a week instead of a full 168, over \$40 in energy costs would be saved annually.
- One computer left on 24 hours a day costs you between \$115 and \$160 in electricity costs annually while dumping 1,500 pounds of CO<sub>2</sub> into the atmosphere.
- A tree absorbs between 3 and 15 pounds of CO<sub>2</sub> each year. That means up to 500 trees are needed to offset the annual emissions of one computer left on all the time!
- If each household in a region the size of the metro Boston area turned off its computer for just one additional hour per day, it would save \$3.2 million in electricity costs and prevent 19,000 tons of CO<sub>2</sub> from heating the atmosphere.
- Electricity production is the largest source of greenhouse gas emissions in the United States, ahead of transportation.

# Save the Planet, Save Your Equipment, Save Money

## 20 Tips for Green Computer Use

- 1 Turn off your computer at night so it runs only eight hours a day—you'll reduce your energy use by 810 kWh per year and net a 67 percent annual savings.
- 2 Plug your computer into a surge protector with a master control outlet, which automatically senses when the computer is not in use and cuts power to it and all your peripherals.
- 3 Purchase flat-screen monitors—they use significantly less energy and are not as hard on your eyes as CRTs.
- 4 Purchase an Energy Star-compliant computer. Note that laptop models use much less energy than desktop units.

5 Plan your computer-related activities so you can do them all at once, keeping the computer off at other times.

6 Consider a smaller monitor—a 14-inch display uses 40 percent less energy than a 17-inch one.

7 Enable the standby/sleep mode and power management settings on your computer.

8 Forgo the screen saver—it doesn't save energy or your screen unless you're using an old monochrome monitor.

9 Review document drafts and e-mails onscreen instead of printing them out.

10 Power off your monitor when you are not using it instead of using screen savers.

11 Consider using an ink-jet printer—although a bit slower than laser printers, inkjets use 80 to 90 percent less energy.

12 Buy vegetable or non-petroleum-based inks—they are made from renewable resources, require fewer hazardous solvents, and often produce brighter, cleaner colors.

13 Turn off all printers and peripherals unless you are using them.

17 Network and share printers where possible.

14 Do not leave the computer running overnight or on weekends.

18 Print on recycled-content paper. Look for non-chlorine bleached papers with 50 to 100 percent post-consumer waste.

15 Choose dark backgrounds for your screen display—bright-colored displays consume more power.

19 Use double-sided printing functions.

16 Reduce the light level in your room when you are working on your computer.

20 E-mail communications as an alternative to paper memos and fax documents.

# How to Create a Green Machine

Activating the power management features on your computer saves energy and money while helping the environment. Your computer's SLEEP and HIBERNATE settings are two of the most effective ways for you to make your computer more environmentally friendly. You can activate these functions manually or through your operating system's pre-set power management settings.

*Ideal for when you are away from your computer for frequent, short periods of time.*

## **Sleep Mode**

Sleep or standby mode conserves energy by cutting off power to your display, hard drive, and peripherals. After a pre-set period of inactivity, your computer switches to a low power state. When you move your mouse or press any computer key, you exit sleep mode and your computer takes you back to its previous operating state. Sleep mode is an especially effective way to conserve battery power in a laptop computer. However, if your computer loses power for any reason while in sleep mode, you may lose unsaved work.

*Ideal for when you are away from your computer for extended periods of time.*

## **Hibernate Mode**

Hibernate mode saves energy and protects your work by copying system data to a reserved area on your hard drive and then completely turning off your computer. It also reduces wear and tear on your components. When you turn power back on, your files and your documents appear on your desktop just as you left them. Be sure to set your system to automatically go into hibernate mode any time your battery power reaches a critically low level.

Follow These Guidelines to Enable Your Computer’s Power Management Features:

Windows Vista	Windows XP/2000	Windows 98	Mac OS X	Mac OS 9
<ul style="list-style-type: none"> <li>• Select Start &gt; Settings &gt; Control Panel from the Start Menu.</li> <li>• The Control Panel has two views. If you are in the Theme View, select System Maintenance and then Power Options.</li> <li>• If you are in Classic View, simply double click on Power Options.</li> <li>• Once you are in Power Options, click Create a Power Plan link.</li> <li>• Enter a name for your new plan in the Plan Name field and click Next.</li> <li>• Set Turn Off the Display for 15 minutes or less.</li> <li>• Set Put Computer to Sleep for 30 minutes or less.</li> <li>• Click the Create button to create and activate your new Power Plan.</li> <li>• To make additional changes, click on Change Plan Settings underneath the name of the plan you just created.</li> <li>• Click on Change Advanced Power Settings. Here you will be able to enable or set values for a variety of Power Management options.</li> <li>• Set Turn Off Hard Disks After for 15 minutes or less.</li> <li>• Click OK.</li> <li>• Click Save Changes.</li> </ul>	<ul style="list-style-type: none"> <li>• Select Start &gt; Settings &gt; Control Panel from the Start Menu.</li> <li>• In the Display Properties window, click the Screen Saver tab, then click the Power button in the Energy Saving Features of Monitor box.</li> <li>• Under Power Schemes, select Home/Office Desk.</li> <li>• Set Turn Off Monitor for 15 minutes or less.</li> <li>• Set Turn Off Hard Disks for 15 minutes or less.</li> <li>• Set System Standby for 30 minutes or less.</li> <li>• Click OK.</li> </ul>	<ul style="list-style-type: none"> <li>• Select Start &gt; Settings &gt; Control Panel from the Start Menu.</li> <li>• Double-click the Display icon in the Control Panel window.</li> <li>• In the Display Properties window, click the Screen Saver tab, then click the Settings button in the Energy Saving Features of Monitor box.</li> <li>• Under Power Schemes, select Home/Office Desk.</li> <li>• Set Turn Off Monitors for 15 minutes or less.</li> <li>• Set Turn Off Hard Disks for 15 minutes or less.</li> <li>• Set System Standby for 30 minutes or less.</li> <li>• Click OK.</li> </ul>	<ul style="list-style-type: none"> <li>• Click on the apple symbol (Apple Menu) in the upper left corner of your screen.</li> <li>• Go to System Preferences, click Show All, and select Energy Saver from the Hardware row.</li> <li>• Click on the Show Details button.</li> <li>• Select Power Adapter under Settings For.</li> <li>• Using the slider, set Put the Computer to Sleep When It Is Inactive for 30 minutes or less</li> <li>• Check the box for Use Separate Time to Put the Display to Sleep and set the time for 15 minutes or less, using the slider.</li> <li>• Check Put the Hard Disk to Sleep When Possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Click on the apple symbol (Apple Menu) in the upper left corner of your screen.</li> <li>• Go to Control Panels and select Energy Saver.</li> <li>• Click on the Sleep Setup tab.</li> <li>• Using the slider, set Put the System to Sleep Whenever It's Inactive for 30 minutes or less.</li> <li>• Check the box for Separate Timing for Display Sleep and set the time for 15 minutes or less, using the slider.</li> <li>• Check the box for Separate Timing for Hard Disk Sleep and set the time for 15 minutes or less, using the slider.</li> </ul>



# Do You Believe in Vampires?

You'd better. In fact, there are probably several vampires in your home right now, sucking power from your electric outlets and money from your wallet.

*Anything that uses a remote continues to consume power even when it's turned off—for example, when a TV is "off," it's really partially "on" so that the picture comes on quickly when you hot the remote. This is called "vampire energy use" or "phantom energy use."*

When your computer, plasma TV, or stereo is off, you probably think it is using as little power as possible. Fact is, these devices have high standby power use. What's more, all of the peripherals connected to your computer—printer, monitor, USB hub, scanner, DSL/cable modem, etc.—continue to consume "idle current" as well.

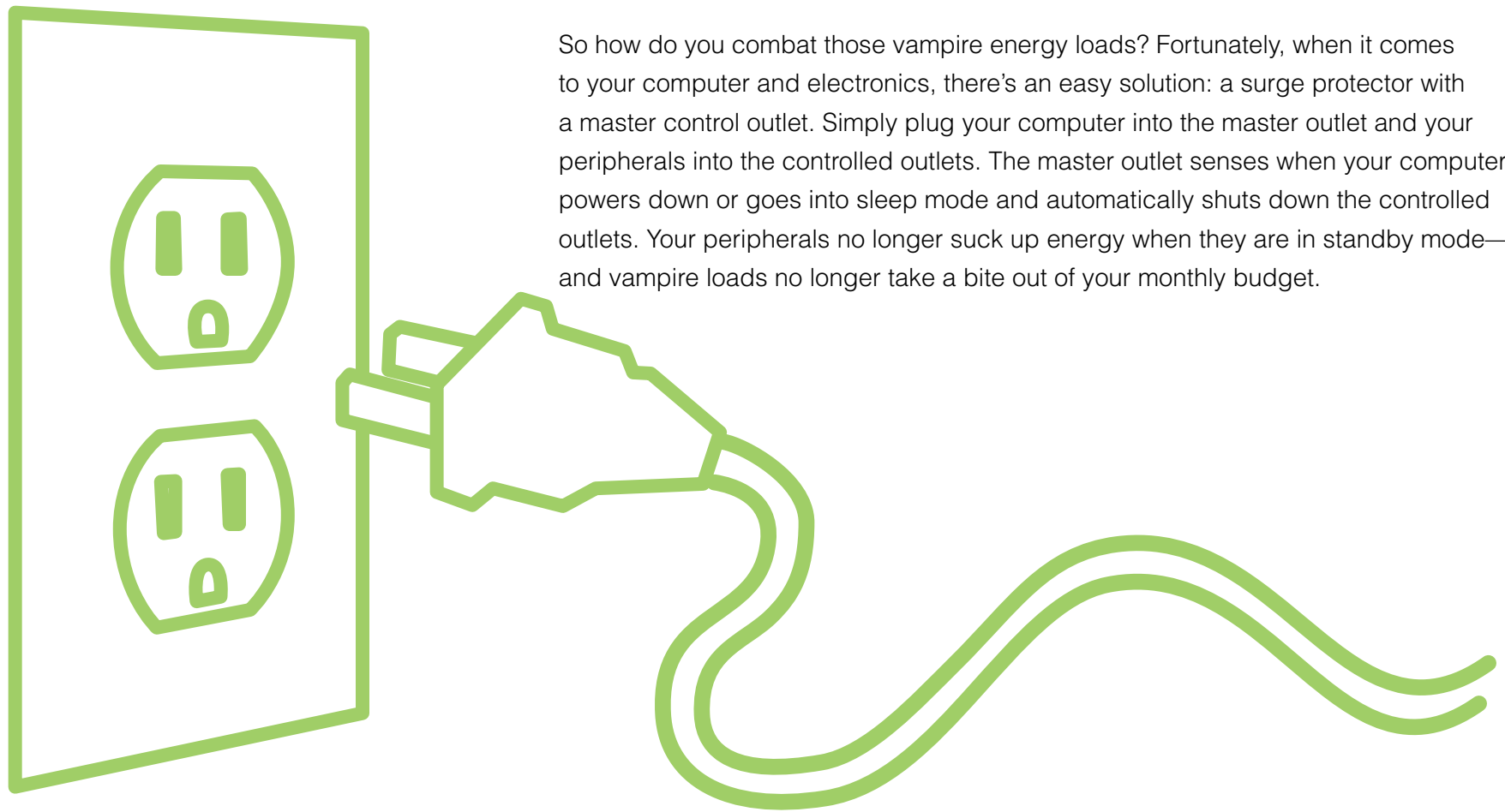
There may be as many as 20 devices drawing standby power in your home. These include any device with a remote control and external power supply (or adapter), permanently illuminated digital displays and LEDs, and many new larger appliances, such as air conditioners and refrigerators.

According to the Department of Energy, "vampire energy loss" represents between 5 and 8 percent of a single-family home's total electricity use per year. On average, that equals one month's electricity bill. Taken across the United States, it adds up to at least 68 billion kilowatt-hours of electricity annually—that's the equivalent output of 37 typical electricity-generating power plants, costing consumers more than \$7 billion. The result of all this wasted energy? More than 97 billion pounds of carbon dioxide seeping into the atmosphere each year.

On a global scale, standby energy accounts for 1 percent of the world's carbon emissions, according to Alan Meier of the Lawrence Berkeley National Laboratory in California.

# A Vampire's Worst Nightmare:

## Surge Protection with Master Control



So how do you combat those vampire energy loads? Fortunately, when it comes to your computer and electronics, there's an easy solution: a surge protector with a master control outlet. Simply plug your computer into the master outlet and your peripherals into the controlled outlets. The master outlet senses when your computer powers down or goes into sleep mode and automatically shuts down the controlled outlets. Your peripherals no longer suck up energy when they are in standby mode—and vampire loads no longer take a bite out of your monthly budget.



## Recycling E-Waste

A recent study by the EPA shows that electronics make up approximately 1 percent of the municipal solid waste stream. Research completed in Europe shows that electronics waste is growing at three times the rate of other municipal waste. Clearly, an essential part of green computing includes proper disposal of components that you no longer use.

### How Much E-Waste Is Out There?

- In a 2006 report, the International Association of Electronics Recyclers projects that with the current growth and obsolescence rates of the various categories of consumer electronics, approximately 3 billion units will be scrapped during the rest of this decade, or an average of 400 million units a year.
- Gartner has estimated that 133,000 personal computers are discarded by U.S. homes and businesses each day.
- Each year 130 million cell phones are retired.
- According to the EPA, we generated 2.6 million tons of e-waste in the U.S. in 2005, or 1.4 percent of total discards. Of this amount only 12.6% was recycled.
- About 68 percent of consumers stockpile used or unwanted computer equipment in their homes.

## Reuse and Recycle: Common Questions About Managing E-Waste

*I just bought a new computer. What should I do with my old one?*

If your old computer is less than five years old, chances are someone else can put it to good use. Donating electronics for reuse extends the life of valuable products and keeps them out of the waste management system.

*What about my old peripherals?*

Remember that a functional, complete system, including monitor, wiring, printer, and software licenses, is preferable to a non-working, incomplete setup. Chances are, your recipient may not have the resources or expertise to make good use of a single component.

*Whom should I donate my old computer to?*

Schools, non-profit organizations, and lower-income families are ideal candidates. You may also be able to take advantage of tax incentives for computer equipment donations.

*Are there any resources to help me find a suitable recipient?*

Here are three organizations that can provide information on donating your computer:

**Goodwill Industries:** Many Goodwills accept computer donations to help individuals with disabilities and other disadvantages upgrade their job skills and enter the workforce. [www.goodwill.org](http://www.goodwill.org)

**Materials Exchange:** Many materials exchanges accept electronics. You'll find a state-by-state listing at this site. [www.epa.gov/jtr/comm/exchstat.htm](http://www.epa.gov/jtr/comm/exchstat.htm)

**Reuse Development Organization (ReDO):** ReDO is a non-profit organization that promotes reuse of discarded and surplus materials, including electronics. [www.redo.org](http://www.redo.org)

*What if my old computer cannot be reused?*

If your computer cannot be reused, recycling it is your next waste management option. Recycling electronics avoids pollution and the need to extract valuable and limited virgin resources. It also reduces the energy used in new product manufacturing.

*What are my options for recycling?*

Contact your city or town to see if it offers computer and electronics collections as part of household hazardous waste services, or if there is a recycling drop-off center in your area. Also, check with TV repair shops, charitable organizations, an electronics recycling company, or even local electronics retailers—they may be your best option for recycling.

*Are there any online resources to help me find a recycling organization in my area?*

To find an electronics recycling organization in your area, visit the following web site:

**EIA Consumer Education Initiative (CEI):** This site will help you find environmentally responsible options for donating and recycling electronics in your community. [www.eiae.org](http://www.eiae.org)

# Key Takeaways

- About 25 percent of the electricity used to power home electronics is consumed when the devices are turned off.
- It takes less energy to boot up a computer than it does to leave it running for more than 3 minutes.
- Plug functionally related electronics into a surge protector (or UPS) that features a master outlet/controlled outlet technology to avoid vampire energy use.
  - Example:** Plug a computer into the master outlet and the peripherals (printer, speakers, etc.) into the controlled outlets. When the computer powers down, the master outlet automatically shuts off power to the peripherals.

## Now What?



Home computer use

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APC power saving SurgeArrest® and/or Back-UPS®

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Up to \$40  
savings per year

About 25% of electricity used to power home electronics is consumed when the equipment is turned off. Plugging the devices into an energy-saving APC Back-UPS ES or SurgeArrest unit allows you to cut power to these “dark loads,” saving an average of \$40 annually.

Learn more about APC Surge Arrest® power-savings surge protectors and Back-UPS® ES “green” models with master/controlled outlets and other eco-friendly, cost-cutting features.

- [Learn about the “green” Back-UPS ES 750 here](#)
- [Learn about the “green” Back-UPS ES 650 here](#)
- [Learn about the “green” power-saving SurgeArrest unit here](#)

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