

Oakland University - Green Computing Guide

(Adapted from document by Walter Simpson, Energy Officer University at Buffalo)

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Introduction

Computers are one of the fastest growing electrical loads in the business world. Each year more and more computers are purchased and put to use. But it's not just the number of computers that is driving energy consumption upward. The way that we use computers also adds to the increasing energy burden.

Research reveals that most personal desktop computers are not being used the majority of the time they are running and many personal computers nationwide are needlessly left on continuously.

Over the last fifteen years, computers have transformed the academic and administrative landscape at Oakland University (OU). There are now over 10,000 computers on campus. Personal computers (PC) operation alone may directly account for nearly \$250,000 per year in University energy costs.

Computers generate heat and require additional cooling which adds to energy costs. Thus, the overall energy costs of OU's personal computers are more likely in the \$400,000 to \$500,00 range.

Meeting computer cooling needs in summer and winter) often compromises the efficient use of building cooling and heating systems by requiring colder fan discharge temperatures. In the summer, these temperatures may satisfy computer lab cooling needs while overcooling other spaces.

Given OU's commitment to energy conservation and the environmental stewardship, we must address the issue of responsible computer use. By adopting conserving practices, annual savings of at least \$100,000 are possible.

How much energy does your computer system use?

A typical desktop PC system is comprised of the computer itself (the CPU or the "box"), a monitor and printer. Your CPU may require anywhere from 50 to 150 watts for a 15-17 inch monitor, proportionately more for larger monitors. The power requirements of conventional laser printers can be as much as 100 watts or more when printing though much less if idling in a "sleep mode." Ink jet printers use as little as 12 watts while printing and 5 watts while idling.

Thus, a typical PC system can use electricity at the rate of 110 to 300 watts or more. At current electric prices, what does this cost the University? That all depends on how the computer system is operated.

First let's take the worst case, continuous operation. Assuming you operate a 200 watt PC system day and night everyday, direct annual electrical costs would be over \$125 (at \$0.066/kWh). In contrast, if you operate your system just during convention business hours, say 40 hours per week, the direct annual energy cost would be about \$30 – plus, of course, the cost of providing additional cooling.

Considering the tremendous benefits of computer use, neither of the above cost figures may seem like much. But think of what happens when these cost are multiplied by the many thousands of computers in use at OU. The energy waste dollars add up quickly.

How many dollars of computer energy consumption can you save?

Here are some suggestions which may make it possible for you to reduce your computer energy consumption by 80 percent or more without losing any productivity or other benefits of your computer system.

Energy efficient computing:

A. Enabling power management features

Thanks to the U.S. Environment Protection Agency (EPA), personal computer systems purchased today can be easy on energy.

These “Energy Star” computers and monitors can be programmed to automatically “power-down” to low power state when they are not being used. These efficiency gains can be achieved without any sacrifice in computing performance.

The EPA has estimated that providing computers with “sleep mode” reduces their energy use by 60 to 70 percent –and ultimately could save enough electricity each year to power Vermont, New Hampshire and Maine, cut electric bill \$2 billion, and reduce carbon dioxide emissions by the equivalent of 5 million cars.

Follow these simple steps to enable computer and monitor power management features for Window 95. Window 98 and 2000 have similar enabling instructions.

- 1. Click “Start” at the bottom left side of your screen.**
- 2. Go to “Settings” and Click on “Control Panel.”**
- 3. Open “Display” and Click on “Screen Saver”**
- 4. Click on “Power” down by the Energy Star logo.**
- 5. Use the pull down menus to “Turn Off Monitor” and “Turn Off Hard Disks”.**
- 6. Select the time (choose a short duration, eg. 5 minutes, to get monitor and disk drive to sleep as soon as possible).**
- 7. Applause!**

(When your computer goes into sleep mode, it is easy to wake it up. Just move the mouse or hit any key)

For assistance: Information Technology Help Desk
248-370-4357 (dial 4357 on campus)
helpdesk@oakland.edu

To save energy with your monitor's built-in power management system, your monitor must go blank. If the screen-save images appear on your monitor for more than 5 minutes, you are wasting energy!

B. Turn it off whenever possible.

This is the most basic energy conservation strategy for any type of equipment. Consider the following:

- Turn off your computer and /or peripherals when they are not in use. A modest amount of turning on and off will not harm the equipment.
- Don't run computers continuously (unless they are in use continuously).
- Turn off at night and on weekends.
- Look for ways to reduce the amount of time your computer is on without adversely affecting your productivity.

Some Specific Suggestions

- Unless you require immediate access to email or internet, break the habit of turning on all your computer equipment as soon as you enter the office each day.
- If practical, informally group your computer activities and try to do them during one or two parts of the day, leaving the computer off at other times.
- Avoid using the switch on a power strip to turn on all your equipment.
- If you use a laser printer, don't turn your printer on until you are ready to print.
- Turn off your entire computer system (CPU, monitor and printer) or at least your monitor and printer when you go to lunch or will be out of office for a meeting or an errand.
- For "computer servers" which must be on to serve network functions, explore ways to turn servers off at night.
- If monitors are not needed for "servers" to operate, keep server monitors off. If server monitor is needed during the day, at least turn it off at night on weekends.

While the energy saving suggestions listed above are appropriate for many campus PC users, some of the suggestions may be inappropriate for certain computer applications or work situations, when in doubt, discuss possible energy conservation measures with your colleagues, supervisor or computer lab director to determine which steps can be taken without harming productivity.

Our Energy Conservation Program Will Not work Without Your Help

- Be an energy educator and gently remind your co-workers and colleagues to save energy by changing their computer habits. Circulate this booklet among the members of your office or department. Gain the support of supervisor and set up a brief meeting to discuss how to implement energy saving strategies.

About Screen Savers

“Screen saver” programs may save the phosphors in your monitor screen but they do not save energy. A screen saver that displays moving images causes your monitor to consume as much as electricity as it does when in active use. These screen saver programs also involve system interaction with your CPU that results in additional energy consumption. A blank screen saver is slightly better but even that only reduces monitor energy consumption by a few percent.

The best screen saver is also the best energy saver, i.e. turn off your monitor when you are not using it! This step also eliminates concern about exposure to any electromagnetic radiation emanating from the monitor.

The next best screen saver is using your computer’s power management feature to automatically shut the monitor down quickly when you are not using your computer, in this case, your monitor will come back to life in a few seconds as soon as you move your mouse. See instructions on page 5 for enabling power management features.

Other Steps Toward Green Computing

You can take a giant step toward environmentally responsible or “green computing” by conserving energy with your computer. But green computing involves other important steps as well. These pertain to paper use, toner cartridges, disposal of old computer equipment and purchasing decisions when considering new computer equipment.

How to reduce Paper

Rather than creating a paperless office, computer use has vastly increased paper consumption and paper waste. Here are some suggestions for reducing this waste:

- print as little as possible. Review and modify documents on the screen. Minimize the number of hard copies and paper drafts you make. Instead of printing, save information to disks.
- Save E-mail whenever possible and avoid needless printing if E-mail messages.
- Use E-mail instead of faxes or send faxes directly from your computer to eliminate the need of hard copy. When you must fax using hard copies, save paper using a “sticky” fax address note and not a cover sheet.

You Can Turn Computer Off!

It is commonly thought that turning it on and off shortens a computer’s life. This belief has led some people to leave their computers on all the time. Others are reluctant to switch their computers on and off a couple times during their workday, even though they are only using this equipment for a fraction of that time.

Most experts agree that turning PC equipment off at night or on and off a few times a night will not appreciably affect its useful life that may only be a few years in any event because of technological obsolescence. Electronic equipment life is a function of operating hours and heat. Both these factors are reduced when equipment is switched off. Concerning hard drive reliability, modern drives are designed and tested to operate reliably for many thousands of hours including thousands of on/off cycles.

Thus, you CAN turn off your computer (and monitor and printer)! The inconvenience of waiting a minute or two for a computer to reboot or peripheral to come back on line may be trivial compared to the energy savings which can be achieved by keeping computer equipment off when not in use.

- On larger documents, use smaller font sizes (consistent with readability) to save paper.
- If your printer prints a test page whenever it is turned on, disable this unnecessary feature.
- Recycled waste paper.
- Before recycling paper which has print on only one side, set it aside for use as scrap paper or in printing drafts.
- Buy and use recycled paper in your printers and copiers. If skeptical, buy a small quantity first and check results. From an environment point of view, the best recycled paper is 100 percent post consumer recycled content and is either not de-inked or is “process chlorine free” (bleached without chlorine).
- When documents are copied, use double-sided copying.
- When general information-type documents must be shared within an office, try circulating them instead of making an individual copy for each person. This can also be done easily by e-mail.

Toward Environmental and Academic Excellence

“I purposed a different ranking system for colleges based on whether the institution and its graduates move the world in a more sustainable direction or not. Do four years at a particular institution instill knowledge, love and competence toward the natural world, or indifference and ignorance? Are the graduates of this or that college suited for a responsible life on a planet with a biosphere?”

-David Orr

In the Market for a New Computer or Printer?

Environmentally responsible computer use implies not buying new equipment unless there is a demonstrated need. Thus, before buying new equipment, consider the following questions:

- Do you really need a new computer or printer?
- Can you meet your needs (with less expense and environmental damage) by upgrading existing equipment?
- Can you find a solution in software rather than hardware?

But if you do need new equipment, buy efficient and buy green.

Purchasing Recommendations

- Buy only “Energy Star” computers, monitors and printers.
- Buy a monitor only as large as you really need. A 17 inch monitor uses 30 percent more energy than a 15 inch monitor when each is in an active mode.
- Buy ink jet printers, not laser printers. These use 80 to 90 percent less energy than laser printers and print quality can be excellent.
- Network and share printers.

- Once they are available, consider buying “Green Computers.” Several computer equipment manufacturers are currently developing PCs which are not only highly energy efficient but are also manufactured in a resource efficient and less polluting manner and are designed and built for eventual recycling.

What to do with your old Equipment?

Currently, OU is not required by law to recycle computer monitors, CPUs, keyboards, or printing equipment. But members of the University community realize that it's the “right thing” to do and have made a commitment to recycle old equipment rather than landfill it. When land filled, computer equipment leaches lead and other heavy metals into ground water and the soil.

OU Energy Management Office

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