



Overview

This guide explains why it's a good idea to “think energy efficiency” when selecting computers and other office equipment, and covers the kinds of labels and energy ratings you should look for when selecting items for purchase. In presenting several energy-efficient office ideas, it explains how:

- » Energy-efficient computers and equipment provide payoffs today and in the future by conserving energy and thus lowering your energy costs helping to improve your bottom line.
- » Recycling helps protect landfills from contamination by toxic materials so often found in used PCs, monitors, and other office equipment, collectively known as electronic hazardous waste, or **e-waste**.
- » Going green is a way to save money and energy.

This guide explains why it's a good idea to “think energy efficiency” when selecting computers and other office equipment, and covers the kinds of labels and energy ratings you should look for when selecting items for purchase. In presenting several energy-efficient office ideas, it explains how:

- » **Understand it:** Take a closer look at labeling and product information to understand which kinds of computing and office equipment represent environmentally friendly options, and understand their energy footprints and related costs.
- » **Plan it:** Explore your upcoming equipment needs and understand which items and components that you might replace require special recycling. Look for specific kinds of devices and components, and check for specific label and energy consumption information to make your selections as energy efficient as possible.
- » **Do it:** Check those items of computing or office equipment to see how they measure up in terms of their environmental quotient, and pick those items that deliver the best long-term cost of ownership.
- » **Use it:** Dig into energy management and equipment setup options that maximize energy conservation, and get the most out of your gear for the least amount of power consumed.



Understand It

Due to the ever-increasing costs of energy, and a consumer and industry trend toward a “greener” computing equipment, PC manufacturers have focused on building more energy-efficient designs. Today’s computing equipment consumes much less power, thanks to systems and components designed to observe activity levels and to ramp-down power consumption as activity levels decrease.

In addition, engineers now focus on building circuits with considerable computing power that require far less energy than earlier designs. This applies to a variety of components, including:

- » **Power supplies:** Designed to convert alternating current to direct current as efficiently as possible.
- » **Processors:** Designed to spread processing among multiple cores while consuming less energy.
- » **Monitors:** Switching from picture tubes to flat-panel displays can cut power needs for display by approximately 60 percent.

In addition, older PCs and monitors — especially picture-tube devices — as well as the circuit boards and other peripheral devices they include, are often full of heavy metals, such as lead, cadmium, mercury, tungsten, and other toxic materials. E-waste disposal includes proper recycling of this waste to avoid further pollution of the landfills. Plus, reusing already processed raw materials is less-expensive than mining and refining — or manufacturing — fresh materials.

DfE (designed for the environment) equipment means it’s been designed to impose as light an environmental footprint as possible. The take-home point for organizations is that environmental consciousness saves energy, and therefore energy costs. In addition, by following energy efficiency guidelines and making simple purchasing changes, your organization’s TCO (total cost of ownership) for office equipment is reduced



Energy-efficient programs

Two key programs come into play when considering the purchase of new computers, peripherals, and other office equipment such as copiers, scanners, and fax machines.

ENERGY STAR

ENERGY STAR is a program designed to help buyers save money while protecting the environment through labeling and education about energy-efficient products and practices. The ENERGY STAR program represents a joint effort between the U.S. EPA (Environmental Protection Agency) and the U.S. DoE (Department of Energy). Equipment with an ENERGY STAR label or logo has met stringent energy efficiency guidelines set by these agencies.

***Note:** The latest version is ENERGY STAR 4.0, effective as of July 20, 2007. This version uses idle power under the operating system as a metric to earn the ENERGY STAR 4.0 rating and requires an 80-percent-efficient power supply. HP was the first tier 1 PC manufacturer to offer products compliant with ENERGY STAR 4.0 guidelines.*

The EPA also offers tools and resources to help individuals, businesses, and institutions plan and undertake projects to reduce energy consumption and improve comfort in the home and the workplace. This includes EPEAT (Electronic Product Environmental Assessment Tool), which is a system designed to help private and public sectors evaluate, compare, and select desktop computers, notebooks, and monitors based on their environmental attributes and energy consumption profiles.

RoHS (Restriction of Hazardous Substances)

RoHS originates from a directive within the EU (European Community) and took effect on July 1, 2006. It restricts the use of six hazardous materials in the manufacture of electronic and electrical equipment: lead, mercury, cadmium, hexavalent chromium, and two brominated flame retardants — PBB (polybrominated biphenyls) and PBDE (polybrominated diphenyl ether). Although originally European in scope, RoHS has come to represent a worldwide standard and now commonly appears on equipment labels in many countries.

***Note:** HP implemented RoHS standards on all business desktops worldwide and in advance of the mandated date.*

Although RoHS probably gets the most attention for computer and consumer electronics, it also applies to large and small household appliances, all IT and telecommunication equipment, lighting equipment, and toys, leisure, and sports equipment



Plan It

When shopping for office equipment and computers, insist on ENERGY STAR ratings and RoHS compliance on any candidates that make it onto your short list for final selection. This is the easiest way to ensure that your future energy costs from those selections will be as low as current technology permits, and that the resulting purchases will contribute minimally to the toxic waste burden of the environment.

Tip: Using ENERGY STAR-labeled products along with renewable energy resources — solar power, wind power, and so on — can result in even greater savings organization-wide.

This applies to PC components you might use in an upgrade as well as to entire computer systems.

Select PCs with energy-efficient power supplies

Upgrading the power supply — the device that converts alternating current from the wall socket to direct current for devices inside the PC — is probably the best solution to cutting energy power usage. That's because most current power supplies usually offer electrical efficiency anywhere between 55 and 75 percent, whereas newer, more energy-efficient power supplies offer 80-percent efficiency.

When configured with other ENERGY STAR 4.0 hardware requirements, HP Labs test results show that an 80-percent-efficient power supply can reduce total system power consumption by as much as 52 percent¹.

By itself, wholesale replacement of older units with newer ones can stretch energy outlays much further, and they lower cooling costs significantly.



Explore thin client solutions

Another terrific energy-efficient solution for many organizations is to make the move to a thin-client computing environment. A thin client is an alternative server-based computing solution with a mouse, keyboard, ports, and network connectivity — much like an ordinary desktop PC — but without a hard drive. Thin clients connect to one or more central servers, which provide all applications and data storage. The design of thin clients results in:

- » Energy cost savings: Because thin clients require less energy than an ordinary desktop PC — up to an 80-percent power savings² — your organization saves energy costs.
- » Fewer repairs: Because of fewer moving parts, thin clients are less prone to repairs and downtime.
- » Reduced support load: Network administrators can support many users from a single server or a group of servers.
- » Improved security: Because the host server provides applications and data, thin clients function only when connected to the server and are highly secure.

Like other HP products, thin clients comply with the RoHS directive.

Recycle and reuse

As you phase-out older equipment, it's also necessary (and in some areas, legally mandated) to keep it out of ordinary trash. This kind of equipment qualifies as e-waste and must be properly disposed of.

Many computer vendors and resellers offer various kinds of disposal programs, from handling the old device that a new purchase replaces to for-a-fee recycling offerings. HP's Product Reuse & Recycling program, for example, is designed to help organizations easily and safely recycle or dispose of HP electronic products. This program offers various product asset recovery programs, such as product buy-back, trade-in, leasing, and recycling. In addition, HP helps customers in the United States to donate working computer hardware to charitable organizations through the NCF (National Cristina Foundation) and the Rethink Initiative with eBay.

Note: *It's becoming increasingly common to pay a small fee when purchasing new equipment to cover the cost of its return and recycling when its productive life ends.*

Numerous municipalities and other local governments also make e-waste collection centers available to their taxpaying citizens.



Get started

Assess your current purchasing and recycling processes and determine where you can improve your organization's green status. Look for products that are EPEAT-registered and carry the ENERGY STAR 4.0 label or logo to help you through this process. Create an energy conservation plan that forecasts costs and cost savings over a one-year, two-year, and three-year time period. This plan should also address e-waste awareness and disposal techniques.



Do It

As you ponder a new graphics card, power supply, or motherboard for a PC upgrade, or select among turnkey notebook, desktop, or server PCs or other office equipment, it's essential to select items that are EPEAT-compliant. Likewise, you can use ENERGY STAR rating information to predict the annual energy costs for the devices you plan to acquire. You may even be able to argue for modestly more expensive and capable equipment on the strengths of the energy costs they'll save during their productive lifetime.

***Note:** On January 24, 2007, President Bush issued Executive Order 13423 requiring all federal agencies to buy EPEAT-registered green electronic products for at least 95 percent of their needs.*

Certainly, this combination of positives — low environmental impact for toxicity and lower energy consumption and costs — offer all kinds of payoffs. Beyond the feel-good side of “being environmentally friendly,” it saves money and provides a better ROI (return on investment). This is as potent a combination to businesses seeking to boost their bottom lines as it's for agencies and institutions seeking to stretch their funding further in times of ever-tightening budgets or shrinking tax bases or donor pools.

Spread the word

Putting an energy conservation program in place requires buy-in from upper management and education for employees. Teach them how and why energy conservation is vital to the organization and how they can help. Efforts that help further a conservation program include:

- » Buying 80-percent-efficient power supplies, which help to lower air conditioning costs because they generate less heat in the work environment
- » Adjusting the thermostat
- » Turning off unnecessary lights at night
- » Placing paper recycling bins in key places

Use email, the intranet, and staff meetings to disseminate information, and consider holding brownbag training sessions over lunch to accommodate employees' busy schedules.



Use It

Once you've implemented energy efficient practices, it's also important to make the most of this kind of technology. On computers, for example, most major modern operating systems offer a variety of less-active states, sometimes called hibernation, that enable equipment to keep running while consuming less energy. Hardware vendors also include special activity monitors that let a PC gradually reduce its activity level and energy consumption after specific periods of idleness or inactivity. Unique to HP's BIOS (Basic Input/Output System) or firmware, you can manually adjust the fan speed to suit your particular environment. Decreasing the fan speed as activity levels decline lowers power consumption.

***Note:** The AMD Cool'n'Quiet and Intel EIST (Enhanced Intel SpeedStep Technology) processors are good options of energy-conserving technology built into HP desktop PCs. These technologies consume less energy than processors offered just a few years ago.*

As you start down the road to energy efficiency, you'll find all kinds of interesting and innovative ways to take a good thing and keep improving upon it. Other positive outcomes will follow as well: more efficient computing equipment tends to be both cooler and quieter, lessening its overall noise and heating impact and improving ambient conditions in home offices and the workplace alike. Subject to less stress from heat and power, more efficient equipment also tends to last longer, and can thus deliver an enhanced return on the original purchase investment.

Continue the momentum

Once you've joined the ranks of other environmentally aware organizations, you can spur continued participation internally by reporting on savings and offering incentives. For example, report savings from your energy conservation program to upper management and employees. Hard numbers and proven cost savings can result in greater participation. Also, offer incentives, such as monthly employee recognition awards or a few hours of personal leave, to employees who offer viable and wide-reaching ways to save energy or whose actions result in the highest cost savings over a period of time.