



## Buying Environmentally Preferable Office Equipment: A Buyer's Guide

Institutions are increasingly concerned about the potential environmental and human health effects of printers, copiers, and fax machines throughout their life cycle, from production to use to disposal. To address these concerns, purchasers are requesting that manufacturers incorporate environmental and human health considerations into their products, services, and practices. These considerations include indoor air quality, hazardous substances, energy efficiency, and waste. Many leading manufacturers already incorporate innovative environmental features into their products and a wide range of products are now available that address these concerns. This fact sheet is intended to help institutions easily adopt a purchasing program for printers, copiers and fax machines (office equipment) that accounts for social and environmental concerns.

### WHAT ARE THE ENVIRONMENTAL IMPACTS OF OFFICE EQUIPMENT?

#### **Hazardous Substances**

While newer products are likely to be designed to meet stringent European toxics reduction requirements, older printers, copiers and fax machines may contain hazardous substances, including cadmium, lead, mercury, and brominated flame retardants such as polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs), which can pose human health risks if these products are improperly managed at the end of their useful life. Buying printers, copiers and faxes with reduced hazardous substance content helps reduce any risks of improper management of these products at the end of their useful life.

#### **Packaging and Shipping**

The use of materials for packaging and shipping is one of the sources of waste in the life cycle of electronic equipment. Packaging is often more than is necessary to protect the items contained, and certain packaging materials are not recyclable. Environmentally preferable packaging involves reusable crates, pallets, and boxes, and recyclable cardboard for internal

cushioning. Choosing a multifunction device will also help to reduce packaging, as well as to save some of the energy that would be expended during multiple product deliveries. Finally, suppliers should take responsibility for removing their packaging: preferably for reuse; secondarily for recycling.<sup>1</sup>

#### **Energy and Consumables**

Office equipment are often kept running, consuming energy, for long periods of time—sometimes 24 hours a day. Much of the energy consumed by electronics is wasted because machines are kept on while not in use. The process of generating electricity for our daily activities can create a range of negative impacts, including the release of greenhouse gases, air pollutants, and mercury, with their attendant impacts on human health and the environment, as well as habitat destruction and depletion of valuable nonrenewable resources. Along with energy use, the consumption of materials such as paper and toner cartridges can contribute to the negative environmental impacts of office equipment. Efforts to monitor and reduce paper use can decrease paper costs for institutions, and substituting environmentally preferable paper, preserve resources, cut pollution, and limit other environmental impacts associated with paper consumption.

#### **Indoor Air Quality**

Emissions from office equipment contribute to indoor air pollution, including releases of ozone, which causes decreased lung function, asthma, throat irritation, coughing, and other respiratory ailments. Particulate emissions resulting from dust, paper debris, and residue from toners and inks can also aggravate the respiratory system. Volatile organic compounds (VOCs) are an additional cause for concern.<sup>2</sup> Specifying office equipment that reduce potentially harmful emissions may significantly improve the health of building occupants.

#### **End-of-Life Management**

Consumer electronics in general comprise a small amount of municipal solid waste (less

than two percent in the United States), but much of this material still goes to disposal. This is unfortunate because many electronic components, particularly imaging equipment, can be remanufactured or recycled at the end of their useful life cycle, conserving resources and eliminating unnecessary waste from landfills.

Purchasers can facilitate reuse, recycling, and proper disposal by choosing models designed for easy disassembly. They should also give preference to products designed for repair, refurbishment or remanufacturing and those that contain reused and recycled parts. Purchasers can lease electronic equipment instead of purchasing it, and also include a take-back provision in specifications, allowing office equipment to be returned to manufacturers at the end of its useful life. Alternatively, purchasers should arrange for reuse of unwanted equipment, or find a responsible recycler for it.

Manufacturers in some locations may have take-back programs, agreeing to take back the equipment at the end of its life and assume the responsibility for reuse or recycling. They may also have asset management programs that allow them to remanufacture equipment as well as reuse some equipment components.



## WHAT CAN PURCHASERS DO?

### Set Goals

Begin by determining your baseline, or current consumption. Establish tracking systems if they are not already in place. Once your baseline is known, evaluate whether you can meet your printing and copying needs with fewer machines. Buying the minimum equipment required to meet your needs is the easiest way to save money. Set reduction goals. For example, aim for reducing paper usage by 20 percent in two years, or reducing energy use by 30 percent, etc.

### Choose the Right Equipment or Service

Using printers, copiers, fax machines, and multifunction devices that meet energy efficiency specifications is an easy way to reduce energy consumption. Similarly, energy saving features such as entering a "sleep" mode after a period of inactivity, allowing equipment to function on low power when not in full use, may help reduce energy consumption. For products where these features exist, stipulate that manufacturers activate all power management features before shipment. Programs such as ENERGY STAR (for the United States and Canada) help sorting through energy efficient products and practices.

In Canada, an example of environmentally preferable purchasing is Public Works and Government Services Canada's procurement program, which requires environmental management systems from the suppliers of imaging devices.

### Digital Copiers

New technologies, such as digital copiers, present opportunities to save paper. Digital copiers often include functions such as multi-page printing on a single sheet of paper, as well as improvements in paper handling that lessen paper jams and misfeeds. The "scan to e-mail" function on copiers is a useful way to replace unnecessary paper copies by scanning and e-mailing documents straight from the copier.

### Multifunction Devices

Especially for smaller offices with low equipment usage, a multifunction device—which may include a copier, printer, fax machine, and scanner in one—can be the most economical and environmentally friendly option. Having one machine with multiple functions will consume less energy than running a single-function copier, laser printer, and fax machine, and it will also significantly reduce maintenance costs. Many multifunction devices can be upgraded,

allowing users to start with basic functions such as copying and printing and later add other functions such as faxing and scanning.<sup>3</sup>

### Leasing and Cost-per-Copy Contracts

Leasing office equipment can have multiple benefits: users are encouraged to minimize printing and copying needs when service bills are pegged to actual use; equipment can be upgraded or replaced by the service provider when better technology enters the market; disposal becomes the contractor's responsibility. Be sure to stipulate disposal that maximizes reuse and recycling and is done in an environmentally and socially responsible manner such as those described in the US EPA's "Plug Into ECycling Guidelines," also known as "Guidelines for Materials Management" at <[www.epa.gov/plugin](http://www.epa.gov/plugin)>.<sup>4</sup>

Cost-per-copy contracts allow organizations to purchase copy services rather than equipment. Contractors can provide office equipment, supplies, maintenance, training, and more. The National Aeronautics and Space Administration (NASA) estimates it will save \$4.5 million over its five-year cost-per-copy contract. Since the agreement combined all of NASA's printing and copying needs into one contract rather than several, it also saved administrative costs and time associated with the contracting process.<sup>5</sup>

### Returnable, Recyclable or Remanufactured Toner and Inkjet Cartridges

Switching to recyclable, remanufactured or returnable toner and inkjet cartridges can save resources and money by reusing components rather than disposing single-use products. Toner cartridges typical of small printers, faxes, copiers, and multifunction printing devices contain 40 percent plastic, 40 percent metal, and 20 percent rubber, paper, foam, and toner, but about 97 percent of this can be reused or recycled.<sup>6</sup> Most business copiers and multifunction printing devices use simple cartridges that do not have metals or electronics in them. Most manufacturers accept spent cartridges and take-back provisions can easily be included in contract specifications.

### Improve Practices

Buying environmentally preferable office equipment is an important step, but some environmental benefits, such as reduced energy and paper use, depend on user behavior.

Below are some guidelines for maximizing the environmental benefits of office equipment:

- Improve user awareness and training in use of environmental features.

- Enable power management features that meet energy efficiency standards where available.
- Set defaults to double-sided printing in all computer programs. Duplexing units allow double-sided copying and reduce paper use by up to 40 percent.<sup>7</sup>
- Adopt a "double-sided" policy to further ensure this practice.
- Reuse one-sided paper. Provide trays to collect paper printed on one side, to be reused in copiers, printers, and fax machines and for note paper.
- Encourage use of multi-page printing on a single sheet as a way of decreasing paper usage and limiting wear and tear.
- Use the size reduction feature. Two pages can often be copied onto one side of paper.
- Send information electronically when possible.
- Turn off office equipment at night and on weekends to save energy and prolong the life of electronic equipment.
- Use the "scan to e-mail" feature to avoid unnecessary copies.

### Measure Progress

Schedule assessments to measure your program's success. Check to see if predetermined benchmarks are being met. Reward or recognize stakeholders responsible for achieving goals. If necessary, identify and address obstacles that may be limiting the program's success.

## IS ENVIRONMENTALLY PREFERABLE OFFICE EQUIPMENT COMPARABLE IN TERMS OF COST, PERFORMANCE, AND AVAILABILITY?

### Cost

Environmentally preferable office equipment generally costs no more than conventional models. In fact, such equipment can save money in the long run. In its 2005 bid, the State of California actually reduced its costs for new copiers while incorporating many environmental criteria.<sup>8</sup>

Duplex units are standard on many printers and copiers, and can reduce paper needs by up to 40 percent. A broad range of office equipment products available from a variety of manufacturers meets the US EPA's ENERGY STAR<sup>9</sup> specifications. ENERGY STAR equipment meets strict energy-efficiency requirements, based on the type of product and its typical usage patterns. However, ENERGY STAR qualification does not add to the cost of office

equipment. Plus, ENERGY STAR equipment is at least 30 percent more efficient compared to similar non-ENERGY STAR products, which decreases energy costs and may yield a longer service life for the equipment.<sup>10</sup> Remanufactured toner cartridges can save purchasers up to 60 percent on a per copy basis compared to new cartridges. For example, King County, Washington, saved \$450,000 in 2004 alone, since its purchase of over 7,500 remanufactured cartridges was approximately one-half the cost of new cartridges.<sup>11</sup> However, remanufactured toner cartridges, just like manufacturers' original equipment cartridges, range in quality and durability and therefore will yield differing life cycle costs. Lower reliability and quality records can result in lower page yields, additional labor, lost productivity and potential printer damage, so it pays to look for quality remanufactured toner cartridges.

### Performance

Environmentally preferable office equipment performs just as well as other models, although a few differences are worth noting. Duplexing, because it is a more complex method of printing, can take extra processing time and potentially increase the risk of paper jams. To reduce these issues, look for office equipment with efficient output speed and maintain it in correct adjustment.

Remanufactured toner cartridges can perform just as well as new ones and can last just as long. However, just like new cartridges, their quality can vary from one supplier to another, as mentioned above. Some toner cartridge remanufacturers guarantee that their cartridges will not damage machines and will cover repair costs in the event of a faulty cartridge. Purchasers should be wary of companies that restrict product warranties if the manufacturer's original equipment is not used. To avoid this, include specification language prohibiting such exclusions. For instance, the Canadian Standards Board has performance standards for toner cartridges to ensure that a remanufactured product will perform as expected.

### Availability

Purchasers—such as the State of California; King County, Washington, and the Commonwealth of Massachusetts—have procured office equipment meeting some or all of the environmental concerns discussed above. Many environmental features are not only widely available, but also easily identifiable. Duplexing units, for example, are standard on higher-speed printers and copiers and many local computer and office supply stores stock remanufactured toner cartridges. There

are currently over 3,000 models of ENERGY STAR-qualified office equipment, from such manufacturers as Canon, Dell, Epson, HP, Ricoh, Sharp, Sony, Lexmark and Xerox.

### HOW CAN PURCHASERS IDENTIFY ENVIRONMENTALLY PREFERABLE OFFICE EQUIPMENT?

Specifications should address the following performance and vendor considerations:

#### Energy Consumption

Meets energy efficiency standards

- Ship with all specified power management features enabled.
- Include all necessary information and technical support to ensure users can easily install and maintain power management features.

#### Indoor Air Quality

Meet Greenguard Environmental Institute's latest allowable emission levels for office equipment or equivalent (currently covers VOCs, formaldehyde, styrene, benzene, ozone, and dust).

#### Hazardous Substances

- Look for products that have reduced or eliminated hazardous substances (e.g., cadmium, chlorinated plastics, halogenated flame-retardants, hexavalent chromium, lead, and mercury).
- Use an organic photoreceptor (or at least one that does not contain arsenic, cadmium, or selenium).
- Use photoconductor drums that do not contain selenium, lead, mercury, or cadmium.
- Use ozone absorption media or catalysts that are non-toxic and do not contain heavy metals.

#### Paper Use

- Include duplexing capabilities, be shipped with a duplexing unit in place, and be installed with duplexing set as the default.
- Ensure products are compatible with the use of at least 30 percent post-consumer recycled content paper.
- State in writing that using recycled paper will not void manufacturer's warranties and service contracts.

#### End-of-Life Management

- Design products to facilitate dismantling and reuse or recycling.
- Provide take-back and end-of-life management services that ensure reuse

(preferable) and/or recycling to the greatest extent feasible in ways that minimize harm to the environment and human health.

- Use packaging and shipping material that contains reused and/or recycled material; is reusable and/or recyclable in the geographic region where the product is sold; and, if feasible, is collected by the vendor for reuse and/or recycling. Efforts should also be made to minimize the use of packaging and shipping material.

#### Recycled Toner and Inkjet Cartridges

- Allow used toner and inkjet cartridges to be returned to the vendor for remanufacturing or recycling.
- Require in writing that vendors provide environmentally sound recycling services for used cartridges.
- State in writing that using remanufactured toner and inkjet cartridges will not void manufacturer's warranties and service contracts.

<sup>1</sup> US Environmental Protection Agency, Environmentally Preferable Purchasing Program. Electronics. Accessed 15 June 2007. Available at <[www.epa.gov/epp/pubs/electronics/electronics2.htm](http://www.epa.gov/epp/pubs/electronics/electronics2.htm)>.

<sup>2</sup> State of California (CA 2006). "Office Machines – Copiers." Environmentally Preferable Purchasing Best Practices Manual. Last updated 12 July 2006. Available at <[www.green.ca.gov/EPP/OfficeMach/copiers.htm](http://www.green.ca.gov/EPP/OfficeMach/copiers.htm)>.

<sup>3</sup> CA 2006. US EPA, Environmentally Preferable Purchasing Program. Greening Your Purchase of Copiers. Accessed 9 August 2006. Available at <[www.epa.gov/epp/pubs/copiers/copiers.htm](http://www.epa.gov/epp/pubs/copiers/copiers.htm)>.

<sup>4</sup> Minnesota Solid Waste Management Coordinating Board (MSWMCB 2002a). "Office Machines – Laser Printers." The Environmentally Preferable Purchasing Guide. Last updated 15 November 2002. Available at <[greenguardian.com/EPPG/6\\_3.asp](http://greenguardian.com/EPPG/6_3.asp)>; US EPA 2006.

<sup>5</sup> US EPA 2006.

<sup>6</sup> Alameda County Waste Management Authority, Alameda County Source Reduction and Recycling Board. Remanufactured Toner Cartridges in Alameda County. May 2004. Available at <[www.stopwaste.org/docs/toner.pdf](http://www.stopwaste.org/docs/toner.pdf)>.

<sup>7</sup> Minnesota Solid Waste Management Coordinating Board (MSWMCB 2002b). "Office Machines – Copiers." The Environmentally Preferable Purchasing Guide. Last updated 15 November 2002. Available at <[greenguardian.com/EPPG/6\\_1.asp](http://greenguardian.com/EPPG/6_1.asp)>; MSWMCB 2002a.

<sup>8</sup> CA 2006.

<sup>9</sup> Both Canada and the United States have equivalent Energy Star programs. Energy Star is an internationally recognized symbol for energy efficiency.

<sup>10</sup> US EPA 2006.

<sup>11</sup> King County, Washington, Environmental Purchasing Program. Remanufactured Toner Cartridges. November 2004. Available at <[www.metrokc.gov/procure/green/tonecar.htm](http://www.metrokc.gov/procure/green/tonecar.htm)>.

**ADDITIONAL RESOURCES**

- Alameda County's "Remanufactured Toner Cartridges Fact Sheet" <[www.stopwaste.org/docs/toner.pdf](http://www.stopwaste.org/docs/toner.pdf)> Offers information in remanufactured toner cartridges, including case studies, how to evaluate remanufacturers, and how to maximize product performance.
- California Integrated Waste Management Board's "Office Paper Reduction Quick Tips" <[www.ciwmb.ca.gov/BizWaste/OfficePaper/QuickTip.htm](http://www.ciwmb.ca.gov/BizWaste/OfficePaper/QuickTip.htm)> Presents tips for reducing paper use and saving money.
- Canada ENERGY STAR Program <[www.energystar.gc.ca](http://www.energystar.gc.ca)>
- US EPA ENERGY STAR Program <[www.energystar.gov](http://www.energystar.gov)> Evaluates energy efficiency of printers, copiers, fax, and multifunction devices and provides tools for purchasers, such as savings calculators and a store locator for ENERGY STAR-certified products.
- US EPA Plug Into E-Cycling Guidelines, a.k.a. Guidelines for Materials Management <[www.epa.gov/plugin](http://www.epa.gov/plugin)>

For examples of specifications for printers, copiers, and fax machines incorporating environmental criteria, consult the following:

- Government of Canada Office of Greening Government Operations <[www.tpsgc-pwgsc.gc.ca/greening/](http://www.tpsgc-pwgsc.gc.ca/greening/)>
- Commonwealth of Massachusetts OFF16 - Photocopiers, Printers, Facsimile/Multifunctional Equipment, Supplies, and Services <[www.comm-pass.com](http://www.comm-pass.com)>
- State of California Contract #1S-05-36-20 - Copiers and Associated Services <[www.pd.dgs.ca.gov/StratSourcing/SpecsDigitalCopiers.htm](http://www.pd.dgs.ca.gov/StratSourcing/SpecsDigitalCopiers.htm)>
- King County, Washington Remanufactured Toner Cartridges <[www.metrokc.gov/procure/green/tonercart.htm](http://www.metrokc.gov/procure/green/tonercart.htm)>

**Standards**

The following environmental standards and certifications are available for office equipment.

- Blue Angel (Germany) <[www.blauer-engel.de](http://www.blauer-engel.de)> Certifies copiers, printers, multifunction devices, and remanufactured toner cartridges.
- Environmental Choice Program (Canada) <[www.nvironmentalchoice.com](http://www.nvironmentalchoice.com)>
- Environment Canada's ecolabeling program certifies printers, copiers, fax machines, and remanufactured toner cartridges.
- Nordic Swan (Denmark, Norway, Iceland, Sweden, Finland) <[www.svanen.nu/eng](http://www.svanen.nu/eng)> Certifies copiers, printers, faxes, multifunction devices, and remanufactured toner cartridges.
- TCO Development (Sweden) <[www.tcodevelopment.com/](http://www.tcodevelopment.com/)> Certifies printers.
- Greenguard Environmental Institute <[www.greenguard.org](http://www.greenguard.org)> The Greenguard certification program evaluates air emissions of office products.



## What is the North American Green Purchasing Initiative?

The Commission for Environmental Cooperation (CEC) launched the North American Green Purchasing Initiative (NAGPI) to harmonize green product standards and practices throughout North America. NAGPI is working closely with public, private, and non-profit organizations to harmonize green standards and specifications throughout North America. NAGPI is structured as a "network of networks," which allows it to quickly gather information, facilitate agreement, and distribute the resulting consensus with large segments of the green purchasing community. For additional information on NAGPI, visit <[www.cec.org/nagpi](http://www.cec.org/nagpi)>.

The CEC is an international organization created by Canada, Mexico, and the United States under the North American Agreement on Environmental Cooperation (NAAEC). The CEC was established to address regional environmental concerns, help prevent potential trade and environmental conflicts, and to promote the effective enforcement of environmental law. The Agreement complements the environmental provisions of the North American Free Trade Agreement (NAFTA). For additional information, visit <[www.cec.org](http://www.cec.org)>.