



Green at Work Guide

**Making Your Workplace Activities More
Environmentally Friendly**

Developed for the
Commonwealth of Pennsylvania
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Introduction

Welcome to Pennsylvania's *Green at Work* guide. It was written to help make greening office operations easy for all Commonwealth agencies by offering standardized information and references. In it, you'll find ways to green your office by making simple changes to the way that you approach your facilities, office supplies, recycling, equipment use, meetings, and other day-to-day workplace activities. You'll also find a pullout poster that lists the key things that you need to do for a green office, making greening even easier.

Individuals and agencies across Pennsylvania have shown their commitment to being green through a variety of activities. Last year, Commonwealth agencies recycled 7005 tons of office, scrap, and computer paper as well as turnpike toll tickets and cardboard. They also recycled 31.5 tons of plastic containers and 9,300 tons of glass, bimetal and aluminum cans, brass, lead, and scrap metal. In greening their automotive maintenance activities, agencies reclaimed 9,675 gallons of waste oil, 2,980 gallons of diesel fuel, and 1,720 gallons of antifreeze. As part of the green furnishings program, over 10,800 cubic yards of nylon carpet were recycled when replaced. Here are just a few of them

The Importance of Choices

It is hard to believe that turning on the lights, printing out a page, or even making a photocopy can contribute to such environmental problems as deforestation and global warming. However, simple workplace activities like these have impacts that are not visible to us and that may extend beyond our life times. Whether we are aware of them or not, the choices that we make in buying products, how we use them, and how we get rid of them have environmental impacts that are often negative.

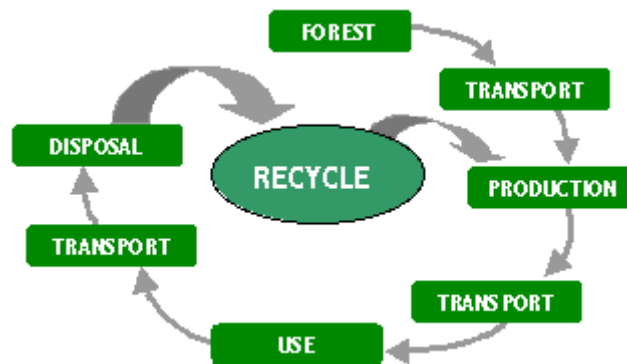
Global warming is one example. Global warming occurs when extra carbon dioxide and other "greenhouse gases" move into the atmosphere and Earth's temperatures go up as a result. Carbon dioxide is found in green plants, especially trees, and in fossil fuels, like coal, oil, and gas. Although Earth's temperatures change naturally, activities like cutting down trees for paper and wood and burning fossil fuels for energy intensify and quicken the process. So, the more fossil fuel energy we use and the more paper products we buy, the more we contribute to global warming.

In order to make more environmentally friendly choices at work, it helps to think about the life cycles of the products that we use. Product life cycles generally begin with the extraction of raw materials that are, then, transported to

manufacturing facilities where the product is made, packaged, and shipped to a warehouse or store. Then, the product is bought and used. At the end of its life, it is disposed of by being given away, recycled, or simply thrown away.

Each of these activities also requires energy. Together, the energy from all of these stages of a product's life cycle make up the product's *embodied energy*.

Life cycle analysis can help us identify some of the impacts that a product may have on the environment. Consider the impacts associated with a common office product - paper - throughout its life cycle.



(The Sustainable Office Forum, <http://www.tsof.org.uk/chcklst.html>)

Impacts to the environment include:

Forest - Trees are cut and removed. This has deep environmental impacts since trees store water, hold carbon dioxide, make the oxygen that we breathe, provide habitat to many species, and have extensive root communities that hold soils in place. Cutting trees reduces the soil's ability to stay in place and to hold moisture, making it vulnerable to erosion. When soil erodes, not only do wind and water carry the soil particles away, but they also carry the nutrients that the soil used to hold. This means that plants that grow there later will grow in poorer soils and may not be as healthy as the original ones. The loss of ground cover associated with deforestation also reduces wildlife habitat, which further throws the ecosystem out of balance. An ecosystem is any community of plants, animals, and other organisms that interact with one another and with the air, soils, water, rocks, and other features of the place where they live.

Transport - Trees are hauled to the manufacturing facility primarily by gasoline-fueled vehicles. Vehicle emissions add to global climate change and contain tiny particles, which contribute to lung problems and smog.

Production - Paper production relies almost entirely on non-renewable energy sources and uses a lot of water. Although there are alternatives, chlorine is usually used to bleach the paper pulp white. As a result, the wastewater from paper plants often contains pollutants, such as organochlorines, which can cause disease and genetic mutation in humans and other species.

Transport - Gasoline-fueled vehicles move paper from the manufacturing facility to the market, contributing further to climate change, smog, and lung-damaging emissions.

Use - A lot of paper is used in copiers, printers, fax machines, and other electronic equipment, which require energy to operate. Most paper is printed only on one side and, then, is thrown away, which misses the chance to use the paper as a resource to make new paper products.

Transport - Vehicles collect waste paper and take it to a landfill or recycling facility.

Recycle - When paper is recycled, it is de-inked and broken down into pulp, which is used to make new paper. When paper is made with paper and not from trees, it reduces the need to cut more trees and use energy and other resources to haul and process them.

Disposal - Paper that is thrown away can no longer be used as a raw material in other production processes. When the paper is put in a landfill, it breaks down very slowly. As it does, the inks, chlorine, and other chemicals that it contains from its production can get into the groundwater and pollute it.

To be green at work, we need to consider the life cycle impacts of the products that we consume.

How to Use This Guide

This guide was developed to help you make green choices at work. You can read it from cover to cover to gain a sense of all of the ways that you can help to green your agency and Pennsylvania. Otherwise, you can use it as a reference guide when you're looking for information on a particular subject.

Green at Work is organized into several sections, which are described below.

Introduction - Offers examples of agencies that are greening and explains why it is important to consider the life cycle impacts of the choices that we make at work.

Greener Purchasing & Suppliers - Discusses some things to consider when buying and

using products. Also addresses how to work with suppliers to identify how green products really are.

Greener Office Supplies - Presents some environmental considerations you can use when purchasing and using office supplies.

Greener Equipment - Explains what to look for when purchasing appliances and equipment and how to use them more efficiently.

Greener Furnishings - Provides some information to help you choose greener furnishings at work.

Greener Recycling & Waste Management - Explores the importance of recycling as well as the materials that are recycled in Pennsylvania.

Greener Meetings & Workshops - Explains some of the many things that you can do to green your meeting preparations and activities.

Greener Publications - Talks about how to green your in-house publications process, from the paper you use to distribution.

Greener Travel - Suggests how you can make your business trips more environmentally friendly.

Greener Commuting - Offers several options available for more environmentally friendly commuting.

Greener Vehicle Fleets - Discusses how to green fleet maintenance operations.

Greener Lunch & Coffee Breaks - Discusses how you can green your lunch and coffee breaks, an important but frequently overlooked aspect of workplace greening efforts.

Greener Building - Offers a synopsis of Pennsylvania's Green Building Program and ways that agencies can green their buildings.

Greener Operations & Maintenance - Explores greener facilities operations and maintenance.

Greener Landscaping - Explores some of the greener ways to maintain the site around your facilities.

Appendix 1. 10 Green Things You Can Do at Work - Provides 10 ways for management and staff to green their workplaces.

Greener Purchasing & Suppliers

Purchasing seems like such an innocent act. Yet it can do significant environmental damage when we are not aware of the impacts of our choices. Purchasing has an enormous effect on what processes are used to make and sell things, on pollution, and on those resources that are taken out of their places in Earth's living systems. That is because every product is tied to the processes used to make it. As the Introduction stated, a product can have powerful environmental impacts throughout its entire life cycle, from the extraction of resources to its production, use, and eventual disposal.

Together, state and local government agencies purchase over \$900 billion of office products and services each year, wielding enormous financial power to help green industries.

What to Purchase

1. Avoid buying more than you need by rotating products with limited shelf lives.
2. Buy products manufactured with non-toxic materials to be safer for the employee and kinder to ecosystems by checking the labels.
3. When purchasing cleaning products (including personal work space cleaners), buy products without hazardous contents that require special handling and disposal. Check with your Right-to-Know Coordinator to determine if the product requires any specialized disposal procedures. Check with product manufacturers to see if they have Material Safety Data Sheets available for their products. These can offer important information on the safety of and handling procedures for certain products.
4. Incorporate a requirement into your purchase order stating that you will not buy products that contain banned or restricted substances, such as CFCs, arsenic, or lead.
5. Whenever possible, incorporate a clause into purchase orders requiring products both that contain recycled content (especially with post-consumer recycled content) and that can be recycled when you are finished with them. Post-consumer recycled content comes from products after they have been used and discarded. (Pre-consumer content is material that comes from manufacturing leftovers, for example. Although it is important to use scraps and other leftovers in production to minimize waste, it does not close the production-purchasing-disposal loop the way that post-consumer content does.) For suggested percentages of recycled content, check the US EPA's Green Procurement Guidelines www.epa.gov/cpg.

PLEASE NOTE: The recycled-content products listed are not only desirable, they have been required for agency purchasing since 1993. This mandate came in the form of Management Directive Number 205.28 in April 1993 (with additional

language in Management Directive 215.14). The Management Directive also tied agency purchasing to the federal Environmental Protection Agency recycled content purchasing guidelines. It can be found at <http://sites.state.pa.us/oa/directives/205-28.pdf>.

6. Put a green purchasing clause into your contracts with your suppliers requiring manufacturers to provide environmentally sustainable alternatives.
7. Look for products that are certified as green. Certification may come from third party certifiers or from information provided by state or local government, local consumer protection groups, or environmental watchdog organizations. Look for U. S. Environmental Protection Agency Energy Star logos or mission statements from companies that have attained ISO 14001 compliance. ISO 14001 is a voluntary international standard that establishes a uniform set of environmental guidelines to which manufactures agree to adhere.
8. Find out what the product's life cycle impacts are. Look for a brand that is greener than its competitors. Find out if the company is ISO 14000-compliant.
9. Check to see that wood products do not contain threatened tropical hardwoods, such as mahogany or teak.
10. When possible, buy products that are easy to maintain and inexpensive to repair or upgrade.
11. For battery-operated products, favor rechargeable batteries over disposable ones.
12. Use products completely before discarding them.
13. For products used infrequently, consider renting or sharing a product with another department or agency before buying it.
14. Also consider visiting the U.S. Environmental Protection Agency Green Procurement Guidelines at www.epa.gov/cpg.

Working with Suppliers

Let your product suppliers know that you are greening your workplace, including your purchasing. Not only does this tell them that greener purchasing is important to a growing number of their clients, but it gives them an impetus to look for more environmentally friendly products.

To ensure that your suppliers have the same responsible policies that your agency has, you may want to ask them the following questions:

- Which of the products that you carry are made from recycled, non-toxic, or sustainably harvested materials?
- What are your products' impacts on environmental health, including human health?
- Will they biodegrade, or will they add to the waste stream?

- What packing materials do you use - reusable pallets, boxes filled with newspaper, unbleached corrugated cardboard, Styrofoam, biodegradable cornstarch peanuts?
- Are packing materials biodegradable or recyclable?
- May we return used packaging to you to be reused or for credit?
- Are the people who make your products paid fairly, and do they work in suitable conditions? Is the company ISO 14001-certified?
- Do your company and any of your suppliers have an environmental mission statement, practicing environmentally friendly policies in the workplace and in business practices?

Buying Green Products in Pennsylvania

The following is a link to federal and state web sites that list greener products. These lists will be expanded as more products are made available. Most of the listed products are made using at least some recycled materials, helping to reduce the amount of waste that goes into landfills and lengthen the lives of resources. Access the list at www.gggc.state.pa.us/purchase/gshplist.html. For more information and specifications on the products listed above, please contact the Commonwealth Agency Recycling Office (717-772-2300), or consult the EPA documents on the Internet at <http://www.epa.gov/epaoswer/non-hw/procure/index.htm>.

Greener Office Supplies

Office supplies include a wide variety of products - paper, pens, highlighters, white boards, memo pads, binders, folders, and more. It is especially important to green paper, as it is the most heavily purchased, used, and discarded office supply in the workplace.

Each year in the United States, the average office employee uses 120-180 pounds of white office paper.

What to Purchase

1. Buy supplies with a high percentage of recycled materials, especially post-consumer content.
2. Purchase recycled, non-chlorine-bleached paper. The state contract for copy paper stipulates 30% post-consumer recycled content. Higher percentage recycled content should be used whenever it is cost-effective. Consider buying 100% recycled-content, process chlorine-free papers for special publications, and make a point of advertising its use on the cover. Explore tree-free papers, such as those made of hemp, kenaf, bamboo, or various other materials also for special projects.
3. Be sure that office supplies - such as highlighters, pens, paper, and office furniture - are non-toxic and, where applicable, were made using recycled or renewable resources.
4. Choose plain paper fax machines rather than thermal paper fax machines. Thermal paper fax machines use a paper that is coated with clay and difficult to recycle. Additionally, the quality of the faxes decreases in time.
5. Try to buy unbleached, recycled-fiber napkins, toilet tissue, paper towels, and coffee filters.
6. Think about alternatives to paper calendars, such as electronic or erasable calendars.

What You Can Do

7. Use copier duplex functions to copy on both sides of the paper. Make this the default setting.
8. Reuse paper for scratch paper instead of notepads.
9. Eliminate the use of fax cover sheets when possible. Consider using recycled post-its, instead.
10. To conserve paper, ensure that documents are single-spaced and don't have margins larger than necessary.
11. Update subscription and document circulation lists regularly.
12. Create an exchange for newspapers and magazines to avoid multiple copies.
13. Post memos and publications online or on an office bulletin board rather than printing them.
14. Edit documents on the computer screen rather than printing multiple drafts.

Disposal

15. Reuse partially used paper for scrap paper, memo pads, or printing drafts of documents.
16. Recycle paper and other office supplies when they can no longer be used.
17. Consider donating discarded supplies that are still useful but no longer needed, according to Commonwealth guidelines.
18. Setup recycling centers in the office to collect alkaline, nickel cadmium, and lithium batteries and recycle them through the DGS recycling office.
19. Purchase toner cartridges from manufacturers that have exchange or recycling programs so that they can be recycled.
20. Collect and recycle used VHS format video tape, computer discs, and old CDs.

Greener Office Equipment

Office equipment includes a variety of machines from personal computers, printers, servers, and copiers to restroom hand dryers, coffee pots, and personal refrigerators. In addition to requiring energy to operate, these products generally contain large amounts of embodied energy, making their cost to ecosystems high.

Office equipment uses about 30 billion kilowatt-hours of energy each year.

What to Buy or Lease

1. Equipment that is energy-efficient both when in use and when inactive.
2. Equipment that powers down when not in use. Check the manufacturer's specifications under energy saving features. Also check to see if the product carries the U. S. Environmental Protection Agency's Energy Star logo.

What You Can Do

3. Set computers to go on standby after a specified period of non-use.
4. Since screensavers do not save any energy, choose the screensaver setting "None" to save energy.
5. Turn off your computer and other equipment when they are not going to be used for a significant period.
6. Turn off your computer monitor whenever you are not using it. (The monitor accounts for about half of a computer's energy demand.)
7. Make sure to shut down your computer when leaving work for the day unless there is a specific technical reason why you should not. The airplane-engine manufacturer, Pratt & Whitney, determined that shutting off its computers and monitors during evenings, weekends and when not in use, saved \$47.00 per year per unit.
8. Ensure that other equipment, such as copiers, go on standby when not in use for extended periods of time.
9. Make sure that printers and copiers have the ability to print on both sides of the paper. Also make sure that printer and copier software will allow the duplexing function to be set as the default.

Disposal

10. If possible, get an agreement from the product's manufacturer that it will take back and recycle your appliance or equipment at the end of its useful life. Currently the Department of General Services has a computer-leasing program that requires the manufacturer to periodically replace old computers with new ones. This allows agencies to keep pace with newer technology while avoiding stockpiles of antiquated hardware.

Greener Furnishings

Choosing greener furnishings can significantly reduce your agency's environmental impacts. Furnishings, such as environmentally friendlier carpeting, paints, and furniture, offer a great opportunity to be greener.

Over 2.5 million tons of carpet are thrown away annually, making up about 2% of landfill volume.

What to Purchase

1. Incorporate a standard requirement in your contract language that carpets, adhesives, paints, upholstery and partition fabrics, and other materials, will not give off harmful gasses or other pollutants.
2. Ask manufacturers for documentation of their environmental claims.
3. Buy remanufactured furnishings and office partitions that are offered by the highest quality manufacturers.
4. Buy carpets, furniture, and other interior furnishings made of recycled products. Use the Department of General Service's procurement contracts, which offer environmentally sustainable products.
5. When shopping for furniture, look for the upholstery that are made with natural materials and non-toxic dyes and that are not treated with toxic coatings. (Some upholstery fabrics are not dyed at all.) Ask the manufacturer's local representative for information on upholstery treatment or go directly to the manufacturer for that information if necessary.
6. If possible, buy furniture made from materials that are grown without the use of toxic pesticides and fertilizers. (Although it is a natural fiber, cotton is the most pesticide-intensive crop in the U.S.)
7. Be sure that furniture does not contain foams with CFCs (chlorofluorocarbons) or HCFCs (hydrochlorofluorocarbons).
8. Purchase furniture that is easy to take apart to replace worn, broken, or missing parts.
9. Refurbish existing office furniture if possible.
10. Find out if any of the furniture's metal or plastic parts contain recycled materials, particularly those with post-consumer recycled content.
11. Look for furniture in which any plastic parts are coded to make recycling easier.
12. If possible, install only wood flooring, furniture, and other products that are made with wood that has been certified sustainable by the Forest Stewardship Council (FSC) or another equivalent organization.
13. Reuse wood furnishings that were used previously.
14. Buy paints, paint strippers, and wallcoverings that are made of non-toxic, natural materials. Currently, the Commonwealth has contracts with several manufactures of low- or no-VOC paints. These contracts can be accessed through the Department of

General Services procurement process. Check labels to determine that the product is low-VOC or no-VOC. (VOCs are volatile organic compounds and are toxic.)

What You Can Do

15. If using wall coverings, be sure that they are applied with non-toxic adhesives or tack them in place.
16. Use all-natural, non-toxic products to clean and maintain furnishings. The Department of General Services has amended contract number 7920-06, change # 2, to include environmentally friendly cleaning products that meet the requirements of Green Seal.

Disposal

17. Before disposing of furniture, find out if it can be reconditioned and reused or recycled.
18. Check with the furniture manufacturer to find out if it will take back and recycle your used office furniture.
19. When you are ready to discard furniture, consider donating it to non-profit organizations, schools, charities, homeless shelters, or churches in accordance with Commonwealth procedures.
20. Visit the Carpet America Recovery Effort (CARE) for information on the joint industry-government effort to keep spent carpet out of landfills. Visit: <http://www.carpetrecovery.org>.

Buying Green Carpet in Pennsylvania

The Department of General Services has a Pennsylvania Commercial Description covering requirements for environmentally preferable commercial grade nylon carpeting - broadloom and carpet tile. Carpet must conform to this Description, unless otherwise specified in the Invitation-for-Bid proposal or Purchase Order. It can be accessed at www.dgs.state.pa.us/comod/specification/1057.

Greener Recycling & Waste Management

Like purchasing, recycling is an important part of a green office. It helps to "close the loop" on waste, feeding materials such as glass, aluminum, and paper back into production processes rather than sending them to the landfill. True recycling means using the material to make a product of equal or higher value than the original product, as opposed to "down cycling" where the material is used in a lesser value product which reduces the value of the resource. Using rubber from waste tires to make high-grade flooring is one example. Burning them for energy is down cycling.

Making aluminum products from recycled aluminum requires about 95% less energy than making products from raw bauxite. The same energy that it takes to make *one* can out of new materials can be used to make 20 cans from recycled aluminum.

Recycling offers several benefits, including:

Saving energy: Making products from recycled materials generally saves a considerable amount of energy. On average, manufacturing with recycled materials requires 17 times less energy per ton of product than making products using virgin raw materials. Some recycled materials save even more than that.

Conserving natural resources: Using recycled, rather than virgin, resources reduces the need for mining, drilling, harvesting, logging, and other means of resource extraction that cause environmental damage. It also tends to require far less water and energy in manufacturing.

Saving money: Rather than having to pay for waste removal, some organizations have found that they can profit by selling their recyclable materials.

Reducing pollution: When industries use recycled materials rather than virgin ones, they tend to create fewer harmful emissions to air, water, and soils in their production processes.

Reducing the need for more landfills: By sending fewer materials to landfills, we can reduce our need for more landfill space.

Creating jobs: The recycling industry has created nine times more jobs than the landfill industry.

What to Purchase

1. Buy products made with high percentages of recycled content and packaged in

recycled, recyclable materials, like remanufactured toner cartridges.

2. Buy products with minimal packaging.
3. Buy goods in returnable containers that can be recycled when they begin to wear out.
4. Whenever possible, buy products in bulk to reduce packaging. Purchasers of bulk commodities must have facilities to handle products and to contain hazardous ones in the event of a spill.
5. When buying in bulk, avoid purchasing more of the product than can be used within the specified shelf life.
6. Buy products shipped with recycled/recyclable packaging.
7. Avoid disposable items and buy products that can be refilled and reused. Tape dispensers, mechanical pencils, pens, and reusable coffee filters are a few examples.

What You Can Do

8. Reduce the amount of waste that you generate by using only what you need and using products until the end of their useful lives.
9. Reuse products whenever possible.
10. Reuse packaging.
11. If you have paper that cannot be recycled, consider shredding it and using it for packaging material.

Disposal

12. Recycle cans, paper, toner cartridges, newspapers, corrugated cardboard, and other materials that are picked up at the office.
13. Arrange with DGS' Recycling Office for special pick-ups or to drop off recyclable products that are not picked up at work regularly, such as computers and equipment, appliances, compact discs (CDs), and motor oil.
14. Try to repair broken products before buying new ones.
15. When you no longer need or want a product, donate it to a charity or community rather than throwing it away in accordance with Commonwealth requirements.
16. Visit www.gggc.state.pa.us/recycle/default.htm for a list of agency recycling coordinators.

Greener Meetings & Workshops

Meetings and workshops can provide real opportunities to show your commitment to being green. They can involve several activities, such as travel, preparing hand-outs, catering, and cleaning. By taking a few extra steps in your meeting preparations, you offer an example to others of how to be more environmentally friendly at work.

Buying recycled instead of virgin paper saves 17 trees, 6,953 gallons of water, 463 gallons of oil, 587 pounds of air pollution, 3.06 cubic yards of landfill space, and 4077 kilowatt hours of energy.

What to Purchase

1. For participants who will be traveling, get meeting rates and book a block of rooms at greener hotels. Explain to participants what a green hotel is and how to find one. Visit the U.S. EPA's green meetings site for more information:
http://www.peninsula.wednet.edu/conservation/Recycling/green_meetings.htm.
2. Provide registration packets in reusable binders or folders made of recycled/recyclable materials.
3. Use post-consumer, recycled paper for registration materials and other handouts.
4. Buy durable, reusable signage.
5. Provide recyclable, reusable exhibit materials.
6. Ensure that any prizes awarded are green.
7. Provide reusable dishes, utensils, napkins, and tablecloths rather than disposable ones.
8. Buy beverages, milk, and cream in bulk and serve them in pitchers.
9. Buy jams, butter, condiments, and other food products in bulk and serve them in bowls.
10. Buy coffee in bulk rather than in individual packets.

What You Can Do

11. Ask exhibitors to use recycled/recyclable handouts, gifts, and other products in their exhibits.
12. Keep promotional materials brief so that they don't require a lot of paper and other resources.
13. Provide slide and overhead capabilities.
14. Place copies of session notes or presenters' papers at the front of the room rather than the rear so that those really interested will take them.
15. When practical, use erasable blackboards or whiteboards rather than flip charts.
16. Distribute registration materials at the meeting rather than mailing them out.
17. Ask attendees to bring their own pens and writing paper.
18. Encourage participants to register electronically or by phone, not by fax.
19. Print meeting-related documents on both sides of paper.
20. Design and use small registration forms that do not require an entire sheet of paper.

21. Ask attendees to place reusable plastic nametag holders in well-marked receptacles at the end of the meeting or workshop.
22. Use non-toxic markers.

Disposal

23. Be sure that there are several well-placed recycling bins and that they are well-marked.
24. Remind attendees just before breaks to help you with your green efforts and recycle.
25. Donate leftover food to a soup kitchen or other needy organization.
26. Compost food scraps.

Greener Publications

Producing in-house publications can provide a number of challenges to greening. Historically, inks, papers, and mailings have had severe impacts on environmental health. Now, however, there are steps that you can take to green your publications process. Using environmentally friendly inks and papers produces greener documents and also enables easier recycling of the documents that you produce.

The U.S. Department of Agriculture reports that about half of the nation's 9,100 newspapers using color ink have replaced their petroleum-based inks with soy inks.

What to Purchase

1. Buy recycled papers.
2. Use lightweight paper, using heavier papers and cardstock only when necessary.
3. Purchase paper in standard sizes to avoid trimming waste.
4. Use vegetable-based inks, such as soy inks, rather than those made of non-renewable, petroleum-based products.
5. Buy inks colored with natural colors when available.
6. Avoid inks containing heavy metals as well as those that are fluorescent or metallic.
7. Avoid varnishes, glosses, foil stamping, and other coatings that will make recycling difficult or impossible.
8. Use bindings that can be easily removed, allowing the paper to be recycled - such as staples, ring binders, and spiral bindings.
9. Ensure that if publications will be mailed, packaging is recycled/recyclable. Avoid shrink-wrap unless you have a process for recycling it.

What You Can Do

10. Produce only as many copies as you need.
11. Whenever possible, distribute documents electronically rather than by hard copy.
12. Encourage staff to share and circulate publications rather than printing copies for everyone.
13. Print on both sides of the paper. Fill up as much of the paper as possible.
14. Keep distribution lists updated so that copies are not sent out inadvertently.
15. Avoid designing brochures, newsletters, and other publications with large margins and large blocks of ink.
16. Avoid designing with bleeds, which result in trimmed and wasted paper. Bleeds occur when you create documents that use ink beyond their margins.
17. Limit the number of colors that you use in your design. (When using traditional production techniques, every color requires a separate print cycle, meaning that more energy is used during production.)

18. Limit your use of colors that are more difficult to remove during the recycling process, such as purples, blues, and reds.
19. Do not use glues for binding, as they make documents more difficult to take apart and recycle. Additionally, glues can be toxic.

Disposal

20. Recycle paper waste from trimmings or bad runs.

Greener Travel

Business travel can provide challenges to greening. Transportation accounts for the majority of greenhouse gas emissions, which contribute to climate change, as well other pollutants, which cause smog and degrade ecosystems. However, with a little ingenuity, you can make your out-of-town visits more environmentally friendly.

The average hotel guestroom uses about 144 gallons of water each day, or 52,200 gallons every year, which costs \$196 annually.

What You Can Do

1. Encourage teleconferencing or videoconferencing in place of traveling to meetings. (Teleconferencing saves on travel costs, employee time, and reduces the amount of pollution associated with vehicle travel, whether it is by car, train, plane, or bus.)
2. If your hotel doesn't offer the option of changing your linens daily, leave them a note by the bed explaining that you do not want them to wash your sheets and towels every day. This will save water, energy, and detergent.
3. Consider starting an agency ride board that lists the use and destination of all agency vehicles used to attend meetings and workshops. Urge employees to check ride boards and consider doubling up whenever practical before signing out a vehicle.
4. If possible, stay at green hotels.
5. Contact the Green Hotels Association for information on greening your hotel and travel experiences. (Visit their web site at: <http://www.greenhotels.com/>.)

Disposal

6. Ask hotel staff where to recycle your plastic bottles and other containers, such as glass bottles, plastic containers, and aluminum cans.

Greener Vehicle Fleets

The use and maintenance of vehicle fleets can have profound effects on ecosystems. By ensuring that vehicles get good gas mileage, using alternative fuel sources when available, avoiding products containing CFCs, and maintaining vehicles to prolong their lives and help them run more efficiently, you can reduce your contribution to global warming, ozone depletion, and pollution.

According to the U.S. EPA, the average car creates more than 600 pounds of air pollution annually and emits about 3.8 grams of volatile organic compounds (VOCs) daily, even when they are not driven.

What to Purchase

1. When buying new vehicles, consider their size and characteristics in relation to their purpose.
2. Request the Department of General Services provide your agency with more fuel-efficient vehicles.
3. Explore the purchase of more fuel-efficient vehicles, such as a hybrid electric vehicle.
4. Purchase re-refined motor oil and other lubricants that contain recycled materials.
5. Substitute hazardous vehicle maintenance products with less hazardous ones, such as water-based degreasers.
6. Purchase fleet-related products in bulk.
7. Consider buying retreaded tires for vehicles when appropriate to their use.
8. Purchase traffic cones and other transportation products that contain recycled products.

What You Can Do

9. Use cleaner, alternative fuels whenever available.
10. Initiate a vehicle maintenance program to assure that vehicles run efficiently and cleanly. For instance:
 - Regularly record fuel use and vehicle maintenance.
 - Check tire pressure regularly. Tires kept at the correct pressure last longer and help the vehicle to move and use fuel more efficiently.
 - Take steps to avoid fluid leaks from causing contamination.
11. Operate the vehicle in such a way that it runs more efficiently and lasts longer. For example, reduce time spent idling, decrease the use of air conditioning when possible, operate vehicles at speed limit, and gradually accelerate and brake.

Disposal

12. Recycle used motor oil and other automotive fluids.

13. If fluids and other materials cannot be recycled, dispose of them safely.
14. Ensure that maintenance contractors follow green purchasing, use, and disposal practices.

Greener Commuting

Commuting to work is a necessary way of life for many Commonwealth employees. Yet, from an environmental standpoint, not all methods of commuting are equal. The type of cars that we drive, how many miles we drive, and how many people are in the car are important factors in determining the most environmentally efficient ways of getting to work.

If each commuter took just one more person to work, the U.S. would save 600,000 gallons of gas every day and prevent the release of 12 million pounds of carbon dioxide into the atmosphere.

What You Can Do

1. Explore agency options to encourage employees to use public transportation. Look at such ideas as the possibility of offering transit checks instead of paying for parking slots.
2. When you buy a car, consider buying a more energy-efficient one. The U.S. EPA estimates that motor vehicle exhaust is responsible for about 60% of all U.S. carbon monoxide emissions. Carbon monoxide decreases the blood's ability to deliver oxygen to the body's vital tissues, mainly affecting the cardiovascular and nervous systems.
3. Minimize distances driven by planning travel routes ahead of time.
4. Carpool to work, riding with at least one other person.
5. If you are close enough to work or are into a fitness program, ride a bicycle to work. Work with your agency to install bike racks at your facilities.
6. If it is available, take public transportation, such as a bus, train, or subway. (A full-size transit bus seats 40 people, meaning that there are 40 fewer cars on the road.)
7. Take advantage of flextime to avoid spending time and gas in heavily traffic when roads are most congested. If your agency has not instituted flextime, suggest that they consider it.
8. If you are moving, consider living close to work so that you can walk, bicycle, or, at least, reduce the miles you drive and the time you spend in your car.
9. To offset the greenhouse gas emissions associated with commuting and travel, consider planting native trees or other plants, which store and use carbon.

Disposal

10. Dispose of used motor oil and other vehicle fluids safely. Note that this is a do at home initiative. Also add regular maintenance for environmental benefits.

Greener Lunch & Coffee Breaks

An enormous amount of food and solid waste is discarded daily during our lunch and coffee breaks. Just as food vendors throw away excess food, our leftovers are usually discarded or placed in non-recyclable, take-home containers. This wastes resources - the food that could feed back into ecosystems to build new soils - as well as the resources used to make disposable containers.

Americans use 2.5 million plastic bottles every hour, many of these containing bottled water or other beverages.)

What to Purchase

1. Whenever possible, purchase organic, non-genetically modified foods and animal products made using more humane techniques. Organic foods are those that are grown without chemical pesticides and fertilizers. This is important not only for human health but also because these chemicals can kill the microorganisms that live in the soil. These microscopic organisms are responsible for building and maintaining healthy soils, which hold nutrients and water used by plants and ingested by those who eat plants.
2. Avoid eating plants or animals whose populations are being harvested at non-sustainable rates, are losing habitat, or are otherwise vulnerable to extinction. For instance, you can visit the Monterey Bay Aquarium's "Seafood Watch" for a list of those fish to eat and those to avoid (http://www.mbayaq.org/efc/efc_oc/dngr_food_watch.asp).
3. Purchase "shade-grown" coffee. (Traditional coffee farms grow their plants under the shade of rainforest trees; both trees and plants offer habitat for migratory tropical birds and other wildlife. In recent years, the high demand for coffee has resulted in farmers changing to "sun" coffee, which requires complete deforestation to provide full sun for the plants. Sun coffee also necessitates the use of pesticides and chemical fertilizers. As sun coffee farms increase, migratory bird populations continue to fall.)
4. Buy coffee, cream, sugar, and other products in bulk rather than in individually wrapped packages.
5. Purchase drinks in large containers rather than those that are individually sized.
6. Avoid buying Styrofoam containers (or ordering food that comes in them).

What You Can Do

7. Keep a coffee mug or a thermos at work for drinks instead of using disposable Styrofoam, plastic, or paper cups.
8. If you are eating out and think that you may have leftovers, bring your own reusable food container.

9. Replace plastic wrap and aluminum foil with more durable, reusable containers when you bring your own lunch to work.
10. Bring reusable lunch bags that are made of canvas or another durable fabric.
11. Use a thermos to replace energy inefficient hot plates and warmers.

Disposal

12. If you buy bottled or canned drinks, be sure to rinse and recycle the bottles and cans when you are finished with them.
13. Bring a container for organic waste, such as apple cores and orange rinds, if you compost at home.
14. Compost coffee grounds on the premises.
15. Consider starting an agency composting project, especially if your agency deals in commissary or industrially catered meals. For basic information on composting, you can visit the DEP's site on composting at home:
http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/compost_sum/home.htm. Additional links are provided.

Greener Building

Just as we consider the life cycle impacts of individual products in our choices, we also need to look at the impacts of our buildings. High performance green buildings provide natural daylight and excellent indoor air quality as well as using half the energy used in conventional buildings. Not only do they provide more pleasant working conditions, but studies also show that they reduce sick time and increase productivity and morale. By contrast, about one in three new conventional buildings is a "sick building." Sick buildings cost U.S. business \$60 billion each year in lost productivity and illness. What we build now our children will inherit. By building greener we lessen their maintenance burden and bequeath them healthier spaces for living and working.

Buildings consume approximately 40% of raw materials, approximately 40% of US energy flows, and construction and demolition waste contribute approximately 40% of the waste going to landfills.

Greening Your Building Leasing, Renovation, and New Construction

Pennsylvania is a national leader in high-performance green building and is setting a leadership example by increasingly seeking LEED certification of new buildings - both those that it owns and those built under lease agreements. In 2001, the Commonwealth spent more than \$115 million on electricity and heating fuel. This is exclusive of rented facilities where energy was included in the rent. If retrofitted with designs assuring a modest 15-25 percent energy decrease, the savings over ten years would amount to \$150 million. Most employees will not be involved in building-related decisions, but, for the few who are, these may be the most environmentally significant actions they take during their careers.

What You Can Do

1. The greenest building is the one you don't build. Consider renovating an existing building. This can involve minor renovations or gutting a building and retaining only the shell.
2. If you need a new building, try redeveloping an already developed site where the infrastructure, such as utilities, is already in place. Act 32 of 2000, the "Downtown Relocation Law," was designed to facilitate the revitalization of traditional central and neighborhood business districts throughout the Commonwealth. State agencies should lead by example by considering locating office facilities to a downtown area. The Department of General Services' policy for the construction of new office facilities requires the agency to consider the rehabilitation, reuse, or both of existing structures within a downtown area.

3. When redeveloping a site, consider deconstructing any existing building rather than demolishing it to allow for the reuse of materials.
4. Consider building on a brownfield site. To learn about Pennsylvania's Land Recycling (Brownfields) Program, visit:
<http://www.dep.state.pa.us/dep/deputate/airwaste/wm/landrecy/default.htm>

The Commonwealth is a leader in developing brownfields - abandoned or underused industrial sites. The Commonwealth's first green building, the Department of Environmental Protection's South Central Regional Office Building, is sited on a 13.4-acre parcel of land that was a shale quarry, a city dump, and, finally, a landfill for debris from Hurricane Agnes.

The Department of Labor and Industry's new Duquesne office is built on a brownfield as well. Over a thousand redeveloped brownfields are the office sites for over 15,000 people in the Commonwealth.

For further information on sound land use initiatives in the Commonwealth, visit the Department of Community and Economic Development's Invent PA website at www.inventpa.com. Learn more about the Pennsylvania Growing Smarter land use program at www.landuseinpa.com. These sites explain past and current land use practices in the Commonwealth as well as the projected impacts of unchecked future land development. They also explore possible resolutions to unsound land use policies and spell out ways citizens can incorporate sound land use practices in day-to-day activities.

5. If you need to have a new building constructed, the Commonwealth's handbook, *Guidelines for Creating High Performance Green Buildings*, provides an introduction to the basic principles and issues. It can be found at <http://www.gggc.state.pa.us/publictn.htm>. For further information, visit: <http://www.gggc.state.pa.us/building/newbldg.htm>.
6. If the building is being constructed under a lease arrangement, please consult the standards adopted by the Department of General Services in the *Model Green Office Leasing Specifications*, which also can be found at <http://www.gggc.state.pa.us/publictn.htm>.
7. If you have a large existing building or building complex that needs a major capital upgrade, consider the Commonwealth's Guaranteed Energy Savings Performance Contracting program.

This program enables agencies to contract with selected companies to provide comprehensive capital energy improvements, such as lighting, HVAC equipment, and controls. The resulting guaranteed savings cover all project costs, including financing, over a ten-year contract term, and help is provided in negotiating the performance contract. Such state facilities as universities, prisons, the Hiram G. Andrews Center,

and Fort Indiantown Gap are using the guaranteed energy savings performance contracting process. Complete contracting information can be found at www.gggc.state.pa.us/building/renovar.htm.

Greener Operations and Maintenance

In order for a building to be green, it also needs to be operated and maintained in an environmentally friendly way. Through greener operations and maintenance, your agency can ensure that it reduces its environmental harm, cuts its operating costs, and enhances the working environment.

A faucet leaking cold water could cost about \$1.50 per week while one leaking hot water could cost about \$20 per week due to the energy used to heat the water. In one year, one leaky faucet could cost about \$1,000.

What You Can Do

Management

1. Work with property management to perform energy and water audits to find opportunities to save resources and money.
2. Monitor for heating and cooling leaks around the building.
3. Ensure that cleanings products used are non-toxic for manufacturers, users, and when disposed.
4. Be sure that cleaning staff is training in the proper and safe use of cleaning products.
5. If you have the option in your office, lower the thermostat a few degrees. (Most buildings are enormous energy guzzlers, and most of the energy used to power them still comes from non-renewable resources.)
6. Reduce the amount of water used by toilets, urinals, faucets, drinking fountains, and showers.
7. Purchase green power, which is generated from renewable fuel sources. (Beginning January 1, 2002, the Pennsylvania government began purchasing 5% (100 million kilowatt-hours) of its energy from renewable resources for the next two years. These include solar, wind, landfill gas, and hydropower. For more information, visit: <http://www.dep.state.pa.us/newsreleases/default.asp?ID=1390&varQueryType=Detail>

Personal

8. Turn off lights when leaving the office for meetings, for lunch, or for the day.
9. Consider taking the stairs instead of the elevator.
10. If it helps you to remember, place a reminder on your door or by your light switch to turn off your lights and equipment when you leave for the day.
11. If you bring in cleaning products for your own workspace, be sure that they are non-toxic.
12. Turn off the water when you're not using it.
13. Keep a bottle of water in the refrigerator to avoid running the water until it is cold.

Disposal

14. Don't use the toilet as a trash can. Excessive flushing wastes water.
15. Report leaks, dripping faucets, and running toilets to maintenance staff.

Greener Landscaping

Consider an opportunity to revitalize some of Pennsylvania's wildness and to enrich its natural beauty and diversity. Through greener landscaping, you have the ability to restore some native plant and animal communities and enhance the diversity of life that they support.

Using a gas-powered mower for one hour emits the pollution equivalent to driving a car 100 miles.

What to Purchase

1. Plant native plants in order to revitalize the native ecology of the area. Native plants also are adapted to weather conditions and require little or no watering when established. (For general information on landscaping with native plants, visit: <http://www.epa.gov/glnpo/greenacres/natvland.html>. For native plant and other information, visit the Sewickley Public Library's Environmental Information Center at: <http://sagan4.einetwork.net/eic/index.cfm>.)
2. Avoid chemical fertilizers, herbicides, and pesticides.
3. When purchasing maintenance equipment - lawn mowers, leaf blowers, chain saws, edge trimmers - look for ones with low emissions. (Two-cycle engines burn gas oil mixtures, which increase emissions.)

What You Can Do

4. Let some landscaped areas grow long and wild. By not cutting them, you are helping to restore habitat and allowing plants to mature and reseed themselves annually.
5. Consider establishing riparian buffer zones between facilities and watercourses in order to keep watersheds and streams healthy.
6. Use grey water for landscaping and irrigation. Check state & local regulation first.
7. If you must water your landscaped areas, consider using underground sprinkler systems that deliver water directly to the roots and prevent the evaporation common with regular sprinklers. Otherwise, you can use soaker hoses as an above-ground alternative to sprinklers. Soaker hoses deliver water directly to the ground so that less water is lost through evaporation.
8. Consider irrigating at night rather than the hottest part of the day to minimize the loss of water through evaporation.
9. Avoid using mowers or other fossil-fuel-powered equipment for landscaping on days when there are smog alerts.
10. Avoid using pesticides on days when there are smog alerts.
11. Work to eliminate the use of pesticides in landscape maintenance.
12. Plant trees around parking lots and other open areas in order for shade and to keep the surrounding air cooler.
13. Be sure to maintain outdoor equipment to prevent leaks or evaporation through broken

seals and the like.

Disposal

14. Compost grass clippings and other organic materials in order to add nutrients to the soil and build more soil. For basic information on composting, visit http://www.dep.state.pa.us/dep/deputate/airwaste/wm/recycle/compost_sum/home.htm.
15. If equipment breaks, try to repair it to prolong its useful life as long as you can use it safely.
16. Safely dispose of used oil and other fluids used in landscaping equipment.
17. Be sure that old pesticides and fertilizers are disposed of properly. Consult your waste hauler or the Department of General Services for guidance.

Appendix 1. 10 Green Things You Can Do

As an Employee

1. Ensure that all new and renovated facilities are resource-efficient and healthy for humans and the rest of the ecosystem.
2. Create and share an agency vision that incorporates green into all planning, policy, development, and operations activities.
3. Institute green as part of the agency's culture.
4. Make green a part of new employee orientation packages.
5. Develop information on greener purchasing, recycling, commuting, etc., and make it easily accessible to staff.
6. Institute an internal conservation committee with representatives from every department to identify areas for improvement and seek solutions to environmental issues.
7. Recognize employees who make extra efforts in helping the agency move toward sustainability or ecological restoration.
8. Track energy, water, resource, and cost savings where possible and use these measures as benchmarks against which to compare future resource use.
9. Undertake retrofits that would increase conservation, such as sensors that turn lights off when not in use.
10. Ensure that outdoor landscaping helps to restore local, native flora and fauna.

Personally

1. Turn off your lights, PC, and other office equipment when not in use.
2. Carpool, walk, take public transportation, or bicycle to work.
3. Minimize water use (e.g., don't let water run as you wash your hands).
4. Buy from greener and socially responsible businesses.
5. Use products efficiently and completely.
6. Recycle paper, cardboard, metals, glass, CD-ROMs, toner cartridges, light bulbs, and any other waste products for which there is a market.
7. Use mugs and reusable utensils rather than Styrofoam and other disposable products.
8. Buy organic and locally grown foods for lunch.
9. Volunteer in conservation-related programs.
10. Save energy by bringing hot coffee in a thermos rather than using individual coffee pots.

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