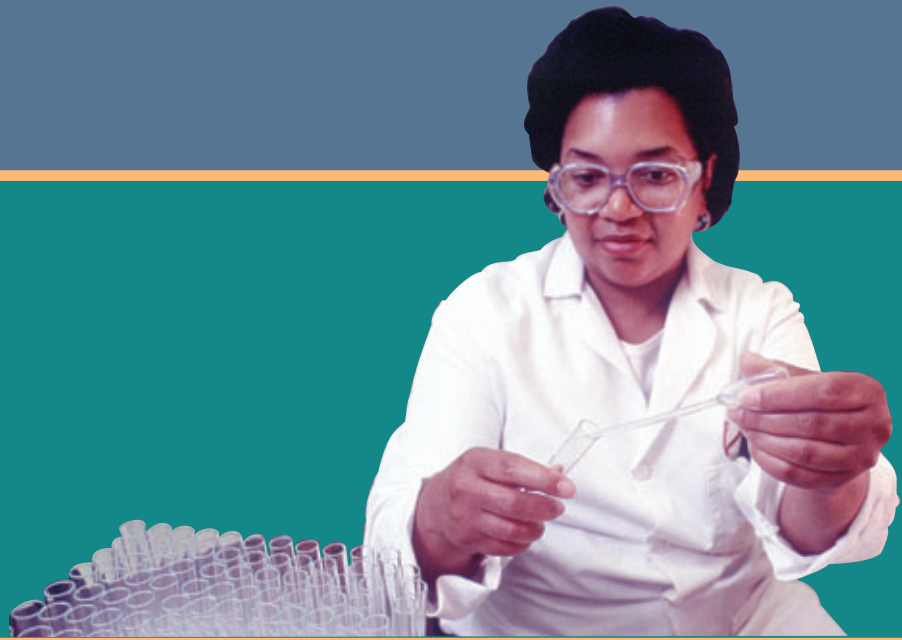




# EPA's Environmental Performance


2003



OARM

**Front cover photos: A wind turbine in Waverly, Iowa (top); an EPA scientist working in Fort Meade, MD (middle); and EPA's Region 7 Office in Kansas City, KS (bottom).**

**Table of Contents page: The National Computer Center located in EPA's Research Triangle Park, NC, Campus.**

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## Contents

From EPA's Environmental Executive	3
EMS Marks Milestones of Environmental Progress	4
Green Buildings Strike Gold	6
Audits Identify Compliance Progress	8
Managing Chemicals With the Click of a Mouse	9
Bringing Down the Mercury	11
Green Power Sparks 2003 Electricity Purchases	12
Targeting Energy for Improved Performance	14
Fuel for the Future	16
Wise Water Ways	16
Green Purchases Close the Loop	18
Acknowledgements	20



EPA Headquarters in  
Washington, DC.

## From EPA's Environmental Executive

As the U.S. Environmental Protection Agency's (EPA's) Environmental Executive, it is my job to ensure that our Agency adheres to several "Greening the Government" executive orders. Focused on environmental management systems (EMS), hazardous and chemical waste reduction, energy and water conservation, alternative fuels, and recycled-content and environmentally preferable products, these orders set goals for EPA and other federal agencies to reduce their impact on the environment.

As the agency charged with protecting human health and the natural environment of this country, EPA is committed to



being a leader in the implementation of these executive orders within the federal government and beyond. Our job is to achieve environmental progress, through prioritization, technology, collaboration, innovation, and compliance. In short, if there is a better way to conduct our business and achieve environmental benefits, EPA should be one of the first to employ it.

In 2003, EPA made significant progress toward reaching our environmental goals. We focused on the strategies that can have a long-term impact on the environment, including establishing an EMS in each key Agency location; incorporating

sustainable aspects into our building leases; reducing toxic chemical use in our laboratories; targeting facilities that use the most energy and water; purchasing green power; and making it easier for employees to purchase environmentally preferable products.

### "Greening the Government" Executive Orders

*Executive Order 13101: Waste Prevention, Recycling, and Federal Acquisition*

*Executive Order 13123: Efficient Energy Management*

*Executive Order 13148: Leadership in Environmental Management*

*Executive Order 13149: Federal Fleet and Transportation Efficiency*

Following is a snapshot of EPA's environmental progress in 2003; our work in each of these areas is an ongoing process. Through our efforts during the past year, we will contribute to a better environment in the future.



David J. O'Connor  
Assistant Administrator (Acting)  
Office of Administration  
and Resources Management

## EMS Marks Milestones of Environmental Progress

**D**uring the past three decades, EPA's strategy for achieving environmental protection has evolved, growing more efficient and effective with time. This evolution culminated in the realization that organizations should integrate environmental considerations into day-to-day decision-making by adopting environmental management systems (EMS). EPA promotes the EMS concept externally, but also works to implement EMS at its own appropriate and significant facilities.

In the 1970s, EPA mandated pollution control technologies and sued companies that failed to comply with regulations. Recognizing the limitations of a prescriptive approach, EPA began to supplement enforcement actions with pollution prevention initiatives and market-based incentives.

An EMS takes environmental stewardship one step further by requiring an organization to develop a formal set of procedures and policies that define how it will evaluate, manage, and track environmental impacts or "aspects" (see opposite page).

Executive Order 13148 challenges federal agencies to establish an EMS at all appropriate facilities by December 31, 2005. During the facility selection process, EPA cast a wide net, requiring 34 offices and laboratories to implement an EMS. By embracing the EMS concept, EPA demonstrates that organizations can take a holistic approach to environmental management.

EPA has identified 12 basic milestones that each of the 34 Agency facilities must meet to complete the EMS development and implementation process. These milestones include performing an EMS self-assessment, identifying significant environmental aspects, setting objectives and targets, and specifying operational controls to address these aspects. Each facility must also establish a management review process and conduct periodic self-audits to facilitate continuous improvement. The final milestone involves completing the EMS self-declaration process or obtaining external International Organization for Standardization (ISO) 14001 registration.

Most EPA facilities have made significant progress toward reaching their EMS goals. In fact, in 2002, the Environmental Science Center (ESC) in Fort Meade, Maryland, became the first EPA facility to complete EMS implementation—and to receive ISO 14001 certification. In preparation for the certification process, ESC employees identified environmental aspects and established goals to reduce the center's environmental footprint. In 2003, the facility achieved the following:

- Reduced paper copies by 24 percent.
- Reduced electricity consumption by 17 percent.
- Reduced water consumption by 37 percent.
- Reduced the quantity of chemicals stored on site.

## EPA's Environmental Aspects

Following is the extensive list of environmental aspects, which each EPA office or laboratory reviewed in developing its individual EMS. In addition to addressing these items as part of the EMS process and putting in place new systems where necessary, EPA as an agency has made significant progress in many of these areas, as demonstrated throughout this report.

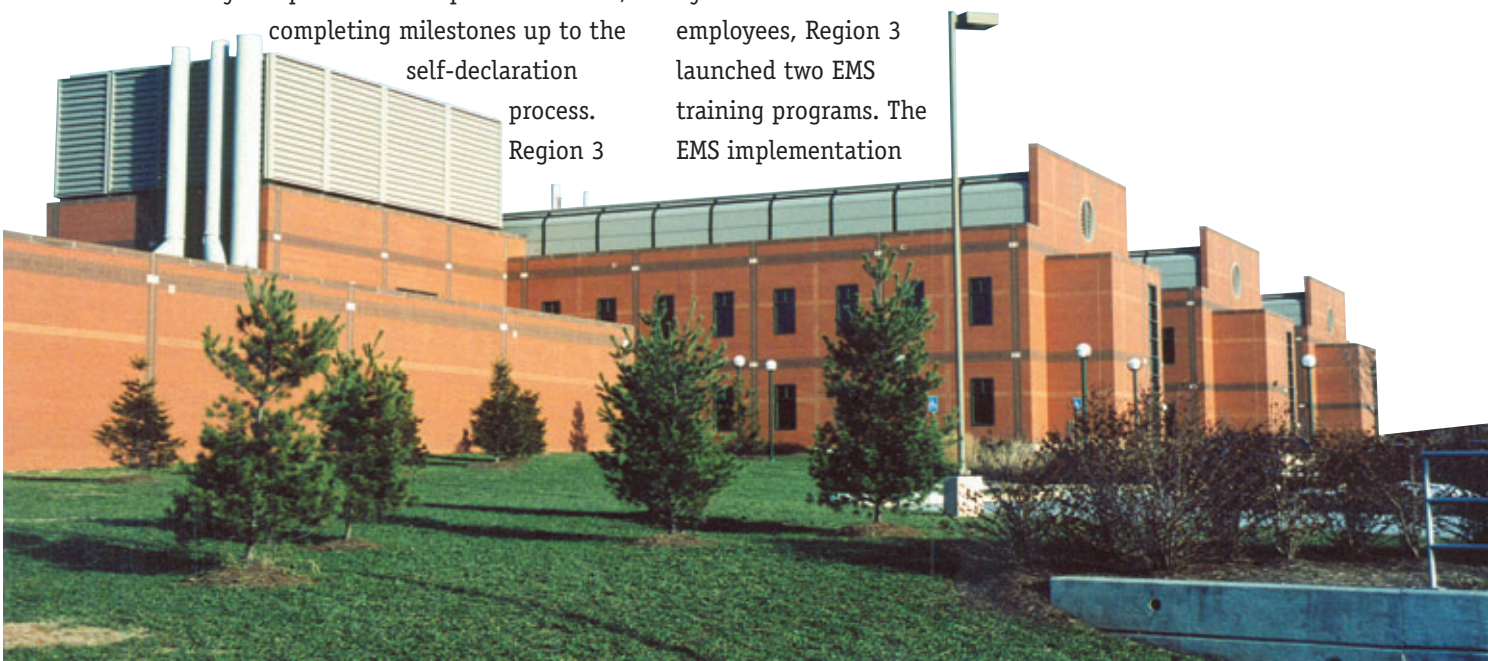
Energy Consumption	Vehicle Exhaust Emissions	Heat Generation
Water Consumption	Fugitive Air Emissions	Transfer of Foreign
Paper Consumption	Vent/Hood Air Emissions	Organisms
Storm Water Discharge	Accidental Releases	UV Radiation
Wastewater Generation	Chemical Consumption	Battery Use
Waste Management	Chemical Storage	Construction/Demolition
Waste Generation	Chemical Reagent Use	Resource/Material
Solid Waste Disposal	Chemical Resources	Consumption
Hazardous Waste	Chemical Disposal	Land Use
Generation	Recycling	Greenhouse Gases
Radioactive Waste	Fuel Consumption	Ozone Depletion
Generation	Fossil Fuel Consumption	Consumption of Disposable
Nonhazardous Solid Waste	Compressed Gas	Supplies and Equipment
Generation	Use of Lubricants/Fluids	Habitat Damage
Wastewater Discharge	Noise Generation	Purchasing Office
Air Emissions		Furniture and Equipment

ESC's EMS implementation team has educated employees at the lab and provided training to other Agency locations, explaining how day-to-day decision-making—from recycling to closing fume hoods—affects the environment.

The Region 3 Office in Philadelphia also nearly completed its EMS process in 2003, completing milestones up to the self-declaration process. Region 3

employees have already reduced paper consumption by nearly 30 percent, but the office's EMS also calls for a 10 percent reduction in electricity use and a 10 percent reduction in gasoline use by the end of September 2005. Region 3 plans to purchase duplexing printers, install the "sleep mode" on computers, and purchase four hybrid cars in the near future. To educate employees, Region 3 launched two EMS training programs. The EMS implementation

**The Environmental Science Center in Fort Meade, MD, was the first EPA lab to receive ISO 14001 certification for its EMS.**



team also sends e-mails reminding employees to turn off lights and computers, avoid making unnecessary copies, properly maintain Agency vehicles, and carpool to work.

During 2003, EPA as a whole expanded efforts to educate staff about the Agency's EMS policy. EPA's Office of Administration and Resources Management (OARM) developed a step-by-step manual on EMS implementation. In August 2003, OARM held a national EMS training seminar for senior

managers in New York City, including a panel of distinguished EMS speakers from the government, industry, and academia, who shared their expertise on the topic. The seminar was well attended, and EPA has produced a videotape of the primary sessions for distribution throughout the Agency. Employees also received EMS basic awareness training via live telecast or a CD-ROM.

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## Green Buildings Strike Gold

**W**hile the Agency addresses existing environmental aspects in its laboratories and offices through the EMS process and other initiatives, EPA is also working hard to ensure that any new office or laboratory, whether leased or owned, leaves a "shallow" environmental footprint. In both new construction and renovation of existing facilities, EPA requires that each major new location be

certified with a Silver rating or higher by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™) program. Using a set of rigorous criteria, LEED™ rates a facility's performance in key environmental areas, including sustainable site development, energy efficiency, water savings, materials selection, and indoor environmental quality.

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## Conducting Due Diligence

EPA has a formal process of assessing past activities and operations that could have environmental liabilities for the Agency. When the Agency plans to vacate a facility for a new locale, EPA initiates an environmental due diligence process (EDDP) to identify, evaluate, and investigate areas of environmental concern left by research operations at the old facility. The Agency follows strict federal regulations for removing underground storage tanks, closing hazardous waste storage areas, and terminating radiological materials licenses. If the EDDP identifies areas of environmental concern, EPA works to decontaminate and remediate the areas affected by both the equipment and the hazardous materials associated with them. During 2003, EPA completed two EDDP projects at its former laboratories in Research Triangle Park, North Carolina, and Kansas City, Kansas.



## Wanted: Green and Healthy Offices

Throughout 2003, EPA worked with the General Services Administration (GSA) to develop new environmental provisions for inclusion in the solicitation for offers (SFO) for the regional office in Denver, Colorado, and the new EPA Headquarters offices in Northern Virginia. The leases for current EPA offices in these locations will expire in 2004 and 2005, respectively, and the Agency has seized the opportunity to improve the environmental performance of its office space. EPA is also working with GSA to include sustainable features in the renovation of a historic building it owns in Boston, Massachusetts, for the New England Region's new office.

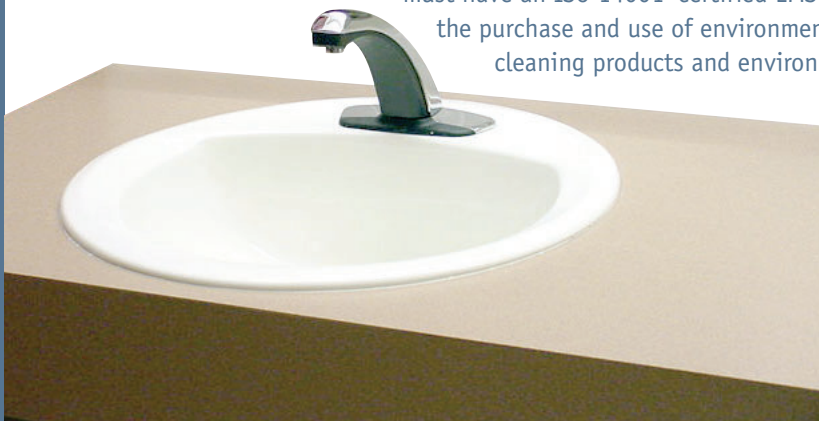
In addition to requiring that each new or renovated space meets LEED™ Silver certification requirements, EPA's SFOs contain a number of additional environmental provisions. Demonstrable achievement in energy efficiency is one key requirement. Office buildings leased by EPA must receive an ENERGY STAR® building label within 14 months after achieving 95 percent occupancy. SFOs also encourage the use of natural light and occupancy sensors that will automatically turn off lights when rooms are unoccupied.

To conserve water, the new SFOs mandate the use of low-flow faucets, electronic sensors, and self-closing sinks. To ensure that employees have safe water, SFOs stipulate that the solder and flux used in joining piping should not introduce lead into the water supply.

EPA also requires use of low-VOC products for paints, adhesives, caulks, and joint compounds. Other building and finishing materials, such as carpet, insulation, and ceiling tiles must meet EPA's comprehensive procurement guidelines (CPG) for recycled content, and builders are encouraged to refurbish and reuse suitable materials when possible.

Finally, EPA's efforts look beyond the construction or renovation process to ensure that the environmental impact of the facility will continue to be minimal throughout EPA's tenancy. The owners of the facility must agree to provide regular recycling service for paper, cardboard, glass, metal, and plastic. SFOs also stipulate that the lessor

must have an ISO 14001-certified EMS addressing the purchase and use of environmentally friendly cleaning products and environmental protections for future repairs.



To conserve water, new SFOs mandate the use of low-flow faucets, electronic sensors, and self-closing sinks.

Establishing sustainable attributes and practices in every leased and newly constructed building has paid off for EPA. In 2003, the Agency achieved LEED™ Gold certification for its new laboratories in Kansas City, Kansas, and Chelmsford, Massachusetts.

EPA opened its new 72,000-square-foot Kansas City Science and Technology Center on May 9, 2003, with numerous sustainable design features. Energy-conserving measures such as a variable air volume laboratory, heat recovery system, and a variable/constant volume combination for the chiller system helped create a facility designed to use significantly less energy than a typical laboratory. A reflective roof surface, daylight dimmers, occupancy sensors, and a design focused on natural lighting also contribute to the building's energy savings.

In addition to water-conserving plumbing fixtures and landscaping with minimal irrigation needs, the laboratory installed an innovative rooftop rainwater recapture system. Rainwater is collected and directed from the roof to a 10,000-gallon holding

tank, where approximately 735,000 gallons per year can be distributed to the lab's toilets, cooling tower, and landscape faucets.

EPA specified low-volatile organic compound (VOC) and recycled-content construction products wherever possible in the new lab, including recycled-content ceiling tile, drywall, insulation, carpeting, and flooring. Recycling was also a priority during construction itself; 72 percent of construction and demolition waste was recycled, avoiding substantial costs in hauling and disposal fees. Combined, these efforts exemplified EPA's commitment to green buildings. The facility received LEED™ Gold 2.0 certification in August 2003.

EPA's 66,000-square-foot New England Regional Laboratory, which was completed in October 2001, received LEED™ Gold certification in April 2003. The lab employs a variety of innovative, resource-conserving technologies, including: energy-efficient skylights; photovoltaic window awnings to generate onsite renewable energy; automated and low-flow sink faucets; and waterless urinals.

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## Audits Identify Compliance Progress

**A**s guardian of the nation's environment, EPA works to set an example on safety, health, and environmental compliance. Executive Order 13148 requires all federal agencies to establish internal environmental regulatory compliance audit programs by 2001, but EPA had developed its Safety, Health, and Environ-

mental Management (SHEM) audit program by 1988. The program provides a systematic, documented, and objective review of Agency activities, facilities, and practices related to meeting safety, health, and environmental requirements and sustaining optimal program performance through effective management systems.

Under the program, industrial hygienists, environmental engineers, fire safety experts, and other professionals audit EPA laboratories at least once every three years and office locations at least once every five years.

Auditors examine the following environmental compliance issues at EPA facilities:

- Air pollution, water pollution, and pesticide control.
- Solid waste disposal practices.
- Drinking water, underground storage tanks, hazardous waste, polychlorinated biphenyls, and radioactive materials management.
- Emergency Planning and Community Right-to-Know requirements.

The audits identify compliance issues with regulations and standards (“findings”) and verify that facilities have taken corrective actions to address past findings.

In addition to determining compliance with applicable regulations, auditors evaluate the processes and procedures facilities have established to identify hazards, manage risk, and reduce environmental impacts. Auditors note pollution prevention and waste minimization efforts and evaluate the effectiveness of each facility’s EMS implementation.

In 2003, EPA conducted 14 comprehensive audits of laboratories, regional offices, and field offices. Auditors did not find anything that posed a significant and immediate threat to human health or the environment. They did, however, document a number of minor compliance violations, and facilities will address these findings by taking corrective actions.

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## Managing Chemicals With the Click of a Mouse

**M**uch of what EPA does to monitor and protect the environment involves chemical research and experimentation. Like any other research organization, EPA’s laboratories must pay careful attention to the chemical products they purchase and the waste they generate. All of the Agency’s laboratories

employ chemical management systems designed to prevent pollution by reducing the amount of

chemicals the labs purchase, tracking chemicals purchased to make sure they are used before their expiration date, and developing chemical reuse or “adoption” programs.

As a best business practice, EPA recommends that its labs use automated tracking systems with integrated inventory databases to constantly monitor chemical use and supplies; as of 2003, more than half of its laboratories were using this software. Using bar-code technology, the program tracks the status of chemical containers once they enter the lab, inventories chemical quantities, and provides

**Safety of all laboratories and workers, like this woman checking for radioactivity, is a key component in the SHEM audit process.**



information about each lab's chemical usage patterns. Within the laboratory, EPA's safety, health, and environmental management personnel can use this information to monitor laboratory-wide chemical use and practices. Individually, labs can use this data in ordering chemicals to ensure that they purchase the exact amount of material they need and reduce chemical waste.

### What Happens in Vegas...

In Las Vegas, Nevada, EPA's Environmental Science Division and Radiation and Indoor Environments National Laboratory employs a software system that bar-codes all chemicals upon receipt from the supplier, before they are distributed. All requests for chemical purchases are compared to the chemical inventory database, and new purchases are delayed or avoided until all supplies are depleted. Chemical storage areas are periodically inspected and inventoried with a bar-code reader. Excess chemicals are offered to in-house users, the local university, public schools in the area, and a nearby Air Force base.

Additional management practices, such as requiring health and safety personnel or a hazardous waste officer to sign off on all chemical acquisition requests before an order can be placed, help facilities minimize purchase duplication, use up any excess materials before new ones are purchased, and ensure that the facility is not purchasing a particularly toxic chemical that could cause a health and safety haz-

ard or create a waste that the lab is not prepared to handle.

When labs do have excess chemicals, many of them try to use them in other areas of the facility. If that is not possible, some facilities make their unused chemicals available to other researchers in the surrounding area (e.g., local colleges, universities, and public schools); 10 EPA labs have such "adoption" programs in place. Another way the Agency avoids chemical waste is by minimizing toxic chemical use wherever possible, by reducing sample size, upgrading lab equipment, identifying innovative methodologies, reusing solvents, and substituting less toxic materials for toxic reagents. These efforts not only reduce chemical risks and waste, but they save the Agency and taxpayers money. In 2003, for example, the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, installed two new solvent reuse systems, which save the cost of purchasing 240 gallons of solvent each year.

Reducing chemical use at EPA goes beyond the laboratory setting; in 2003, more than three quarters of the Agency's facilities were making an effort to "green" custodial practices, modifying janitorial contracts to encourage the use of non-toxic cleaning agents and/or reduce the amount of the cleaning agents used.



**EPA scientists take great care to remove soil samples from an Oregon estuary with minimum disturbance to sample integrity and the surrounding ecosystem.**

## Bringing Down the Mercury

**E**PA has targeted mercury as a toxic and hazardous chemical to reduce from its operations. By replacing old equipment with new, environmentally preferable versions, the Agency is not only ensuring that its offices and facilities have the least impact on the environment, but also working to protect human health and safety.

Mercury is a threat to human health due to its persistent and bioaccumulative characteristics. A large percentage of products that contain mercury—such as conventional fluorescent light bulbs, thermometers and other medical devices, pressure gauges, switches, and batteries—wind up in the solid waste stream every day. Once mercury contaminates water and soil, it can affect wildlife, fish, and plants, which in turn can travel up the food chain and eventually impact human health.

Executive Order 13148 requires each federal agency to reduce hazardous substances and pollutants by 50 percent by December 2006, through effective facility management and procurement practices. EPA's Headquarters and regional offices, satellite locations, and laboratories host a variety of activities for which replacing hazardous products and equipment is no small task.

### Light Bulbs Go Off

EPA employed a comprehensive strategy to reduce the amount of mercury waste created during the construction of its new facilities in Research Triangle Park, North Carolina. The Agency specified low-mercury light bulbs and replaced their mercury thermometers, barometers, and manometers with digital or alcohol-based equipment. Employees were not permitted to bring their old mercury-containing equipment into the new facility from the old laboratory, and the Agency recycled and disposed of the old mercury-containing products properly.

In 2003, the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, replaced its conventional fluorescent light bulbs with low-mercury bulbs. While the laboratory currently uses other mercury-containing equipment, such as thermometers, barometers, pressure sensors, and mercury switches, it is looking to replace the equipment with mercury-free products in the near future.

The Agency is answering this challenge by working hard to purchase mercury-free laboratory equipment and low-mercury fluorescent bulbs. In addition, EPA's commitment to the safe disposal of mercury-containing light bulbs goes beyond its own offices and facilities; the Agency launched a national outreach program to promote recycling of fluorescent bulbs and reduce the use of mercury in light bulbs.



## Green Power Sparks 2003 Electricity Purchases

For the past five years, EPA has been aggressively pursuing purchases of “green” power for its offices and laboratories across the country. Renewable energy, in the form of wind power, landfill gas, and onsite solar technologies, has reduced the Agency’s reliance on fossil fuels and lowered many of the greenhouse gas emissions associated with electricity use. However, 2003 in particular was a banner year for EPA’s Green Power Purchase program, as the Agency more than quadrupled its procurement of renewable energy.

To help educate employees on the Agency’s green power purchases, window “clings” are hung throughout EPA buildings that purchase renewable energy.



By the end of 2003, EPA was purchasing green power and “green tags” (also known as renewable energy certificates) for 10 of its facilities at a rate of 111 million kilowatt hours (kWh) per year, or 40 percent

of the Agency’s electricity use. Following are the newest EPA facilities to join those already using green power for 50 to 100 percent of their electricity needs:

*EPA Headquarters, Washington, D.C.:* In the Agency’s largest green power purchase to date,

EPA Headquarters began purchasing a blend of 25 percent wind power and 75 percent landfill gas generated at Mid-Atlantic facilities in Fall 2003. The purchase totals 39 million kWh per year,

enough electricity to power 100 percent of the Agency’s Federal Triangle offices.

*Research Triangle Park, North Carolina:* EPA contracted to buy more than 35 million kWh worth of green power annually, or 50 percent of the electricity needed to power the Agency’s new main laboratory building and National Computer Center. Approximately 6 million kWh of the green power is generated from sources in North Carolina, and nearly 30 million kWh is from green tags, which support a wind farm in Iowa and a landfill gas facility in Florida.

*Houston, Texas, Environmental Laboratory:* In June 2003, EPA contracted to receive 3.3 million kWh worth of green tags annually from a New Mexico wind farm, the equivalent of 100 percent of the Houston lab’s electricity needs.

*Region 2 Office, New York City:* Also in June 2003, EPA’s offices in New York City became the Agency’s first regional office to purchase 100 percent green power for its electrical needs. The purchase of 6.1 million kWh per year from the Fenner Wind Project also made the office the largest federal purchaser of wind power in New York State.

*Region 2 Laboratory, Edison, New Jersey:* In September 2003, EPA completed a purchase of 4.5 million kWh per year of electricity from biomass and landfill gas, or 100 percent of the lab’s electrical needs.

In addition to the new purchases completed in 2003, EPA continued to procure 100 percent green power at five additional facilities. The following contracts were initiated between 1999 and 2002:

*Richmond, California, Laboratory:* 1.8 million kWh per year of landfill gas.

*Golden, Colorado, Laboratory:* 1.9 million kWh per year of wind power from Xcel WindSource.

*Manchester, Washington, Laboratory:* 2.1 million kWh in green tags annually from the Bonneville Environmental Foundation.

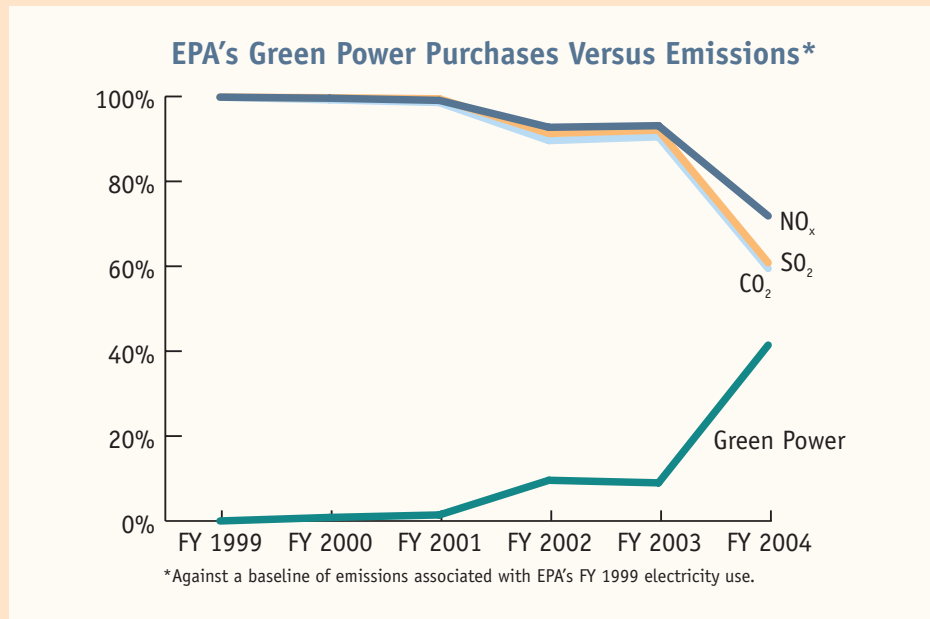
*New England Regional Laboratory, Chelmsford, Massachusetts:* 2.8 million kWh per year from wind power sources in New York and Vermont.

*Cincinnati, Ohio, Laboratories:* 15 million kWh per year of landfill gas from Illinois and a wind farm in Pennsylvania.

## Clearing the Air With Green Power

With each green power purchase, EPA is helping to reduce the emissions of carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>)—greenhouse gases associated with the production of traditional energy sources such as coal. As EPA's green power purchases continue to increase, the annual emissions related to its electrical purchases since 1999 have consistently decreased.

By the end of 2003, based on the Agency's commitment to purchase 111 kWh per year of green power, EPA was contributing to greenhouse gas emissions reductions totaling 97,217 metric tons of CO<sub>2</sub>, NO<sub>x</sub>, and SO<sub>2</sub>, or the equivalent in carbon dioxide reductions of removing approximately 12,500 cars from the road, per year.



With each green power purchase, EPA helps reduce emissions of carbon dioxide, nitrogen oxides, and sulfur dioxide associated with traditional energy generation.

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## Targeting Energy for Improved Performance

While using green power for its electrical needs can have a positive effect on air quality, EPA recognizes that an even better way to reduce the impact of its energy use is to consume less in the first place. While the Agency includes energy conservation language in its lease provisions for offices (see page 7), EPA can have the greatest effect on energy performance in its 29 laboratories, where it uses the most power and controls the building mechanical systems.

Under Executive Order 13123, EPA reports its energy use for each fiscal year (FY) on a British thermal unit (Btu) per gross square foot (GSF) basis. In FY 2003, the Agency's 29 laboratories consumed a total of 326,455 Btus/GSF. Energy from offices and some other labs, which are handled under leases by the U.S. General Services Administration (GSA), is reported by GSA. Executive Order 13123 requires federal agencies to reduce their energy use in laboratories and other energy-intensive facilities by 20 percent by FY 2005, measured against the Btus/GSF used in FY 1990. Compared to that baseline, when the Agency's labs consumed 357,864 Btus/GSF, EPA has reduced its energy use by 8.8 percent.

Four facilities on two campuses (Research Triangle Park, North Carolina, and Cincinnati, Ohio) represent about half of the Agency's laboratory space and reportable energy use. With that in mind, EPA prioritized its energy conservation efforts in

2003 and focused its resources on the largest energy consumers in its lab inventory, making progress on building re-commissioning efforts, mechanical upgrades, and energy master planning.

Re-commissioning, a coordinated effort to identify system operation improvements and energy saving opportunities in existing buildings, was launched in EPA's new main laboratory in Research Triangle Park. While the lab incorporates a variety of energy-efficient technologies and automated systems, re-commissioning the entire building will help identify and implement operational opportunities to make the lab perform better and realize significant energy savings. EPA is also retro-commissioning two of its older facilities in North Carolina—the Human Studies Laboratory in Chapel Hill, and the National Health and Environmental Effects Research Lab in Research Triangle Park.

Since the Agency was founded in 1970, some of EPA's earliest facilities are ready for major system replacements, as these systems reach the end of their useful lives. The A.W. Breidenbach Environmental Research Center in Cincinnati, Ohio, for example, is more than 30 years old, and its mechanical system needs to be replaced. As part of the planning process for that upgrade, EPA has incorporated energy master planning. This process allowed the Agency to evaluate energy-efficient approaches to the mechanical systems



replacement, including moving from constant volume to variable air volume laboratories (see sidebar at right). In 2003, EPA completed its energy master plan for this facility, which set a strategic direction for significant energy savings as the mechanical systems are replaced over the next eight years.

Energy performance improvements are not limited to EPA's large facilities; in 2003 the Agency made progress in several other labs. Mechanical system improvements were designed for EPA's lab in Houston, Texas, where the hot, humid climate leads to a high Btu/GSF ratio. In Narragansett, Rhode Island, the Atlantic Ecology Division Laboratory put a contract in place for a new, efficient chilled water system. And EPA's Richmond, California, laboratory completed designs to replace an oversized boiler, upgrade controls, and install a natural gas co-generator.



## Lab Hoods Close in on Energy Savings

Because of the nature of the research that goes on in many EPA facilities, and for the protection of laboratory workers, the quality of air in each laboratory is extremely important. Lab air purity and employee safety are maintained by a number of fume hoods. In many of EPA's laboratories, these hoods have traditionally controlled air flow at a constant volume.

To address energy efficiency and ensure the safety of its research and workers, EPA is working to transition many of its laboratories to variable air volume (VAV) technology. By replacing outdated equipment where possible and designing its new laboratories with VAV systems, the Agency is realizing significant savings in energy use. New VAV labs include those in Kansas City, Kansas; Chelmsford, Massachusetts; Research Triangle Park, North Carolina; Fort Meade, Maryland; and a new wing completed in 2003 in Manchester, Washington.

The Agency has introduced new automated systems that monitor building systems remotely and generate reports, to identify opportunities where additional efficiencies could be realized—particularly during the unoccupied time in laboratories.

**Closing fume hood sashes not only provides a healthier lab environment, but can also help save energy with VAV technology.**

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## Fuel for the Future

**A**s EPA strives to incorporate the best environmental practices into everyday activities, the Agency continues to pay close attention to its vehicle fleet. For the fourth straight year in a row, EPA exceeded the Energy Policy Act's requirement that 75 percent of nonexempt, new vehicles acquired by federal agencies be alternative fuel vehicles (AFVs). AFVs include those powered by compressed natural gas, ethanol, and/or electricity. AFVs are more fuel-efficient and emit less carbon monoxide, carbon dioxide, and other air pollutants than traditional vehicles. As of FY 2003, more than 365 of EPA's 1,197 national fleet vehicles are AFVs or other advanced technology vehicles, such as hybrid-electrics.

Looking beyond its own fleet, EPA is also helping to encourage the use of AFVs in the commercial marketplace, particularly with respect to vehicle fuel cell technology. In May 2003, EPA announced a new government-industry partnership with DaimlerChrysler and UPS to promote hydrogen-powered fuel cell delivery vehicles, testing the vehicles in a real-world setting.

Set to hit the road in 2004, these Daimler-Chrysler fuel cell vehicles will be used in typical UPS delivery operations on established routes. This initiative represents the first time that zero emission medium-duty fuel cell delivery vehicles will be introduced as a part of a commercial vehicle fleet in the United States. The program, based at EPA's National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, will enable EPA and its partners to continue evaluating fuel cell vehicle attributes such as fuel economy and driving performance under varying weather conditions. The Agency's Ann Arbor lab will also serve as a hydrogen refueling station for the UPS delivery vehicles. This program will allow EPA, DaimlerChrysler, and UPS to evaluate the operations of fuel cell fleet vehicles and the new hydrogen refueling station.

This partnership and the promising technologies of fuel cells and hydrogen fuel fit together with EPA's overall strategy of protecting public health and the environment while reducing greenhouse gas emissions.

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## Wise Water Ways

**E**PA recognizes that sound resource management, including careful, efficient use of our nation's water resources, is essential to protecting natural habitats and public health. EPA is also

aware that many of its facilities, particularly its laboratories, are large consumers of water. To do its part, EPA set an internal goal of reducing water use at its facilities by 10 percent by FY 2010 from

consumption levels in FY 2000. The Agency is well on its way to achieving this goal: in FY 2003, EPA consumed approximately 172 billion gallons of water in the 29 laboratories where it controls the utilities—a decrease of more than 8 percent from the FY 2000 baseline.

The Environmental Science Center (ESC) in Fort Meade, Maryland, completed a water management plan in 2002 and now exemplifies Agency water conservation. In 2003, after re-evaluating the lab's reverse osmosis/deionization system (processes used to purify water by removing minerals), ESC was able to reduce the quantity of water consumed and discharged by optimizing the system's schedule. The result was more than 40 percent water reduction since FY 2000. The laboratory also decreased the quantity of water used in the cooling tower by increasing the water recycling rate. These efforts to maximize cooling tower and deionized water production efficiency combined to save nearly two million gallons of water in FY 2003.

Similar reductions were seen at EPA's lab in Ada, Oklahoma. As part of an energy savings performance contract (ESPC), the lab installed a geothermal heat pump, which helped to reduce cooling tower water needs—reducing water

consumption by more than 40 percent from FY 2000 to FY 2003.



## Conserving Water Is Part of the Plan

Executive Order 13123 requires every federal agency to implement water management plans in 10 percent of its facilities by FY 2004. Having completed water management plans at three facilities in 2003—the National Vehicle and Fuel Emissions Laboratory (NVFEL) in Ann Arbor, Michigan; the Region 8 Lab in Golden, Colorado; and the Atlantic Ecology Division Lab in Narragansett, Rhode Island—EPA has exceeded the executive order requirement.

NVFEL, for example, was able to demonstrate how water management plans and ESPCs can be integrated to provide greater water reductions. The lab combined elements of its management plan, completed in April 2003, with its ESPC to reduce water consumption approximately 80 percent from FY 1993–1995 (baseline) to FY 2003. Looking to the future, EPA has water management plans underway in several facilities, including its largest lab complexes in Research Triangle Park, North Carolina, and Cincinnati, Ohio.

The New England Regional Laboratory in Chelmsford, Massachusetts, began implementing a water management plan in 2003. The lab installed waterless urinals, estimated to save 20,000 to 80,000 gallons of potable water per year. As mentioned in “Green Buildings Strike Gold” (page 8), the Agency is using technology and innovation to reduce water use through a rooftop rain recovery system installed in its new laboratory in Kansas City, Kansas, which

**A commercial water softener installed at EPA's Region 7 Office has allowed that building's cooling tower (pictured) to run more efficiently.**

opened in 2003. To reduce office water use as well, EPA installed a new water softener at the Region 7 Office in Kansas City, Kansas. The softener reduces the hardness of the water before it reaches the cooling tower, preventing scale deposits from building up, and therefore reducing the need for flushing and draining of the water. During a typical hot summer day, this will reduce cooling tower water use by 5,700 gallons of water per day—a total of

700,000 to 900,000 gallons per year (or a 62 percent cut in water use).

EPA continues to assess water use at a number of its facilities and develop comprehensive water management plans to increase water efficiency at these facilities (see previous page). EPA also launched a water conservation awareness campaign in August 2003, "Every Drop Counts...Count Every Drop," aimed at promoting specific water conservation actions to all of EPA laboratories.

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## Green Purchases Close the Loop

**W**hile EPA emphasizes recycling collection programs in all of its facilities, the Agency recognizes that collection is just one step in the recycling process. A complete recycling program includes buying products that contain recycled content materials, and EPA strongly promotes the motto, "If you're not buying recycled products, you're not really recycling."

EPA took a major step in increasing its recycled-content purchases when the Agency's Office of Acquisition Management awarded a new Blanket Purchasing Agreement (BPA) in October 2003 focused on

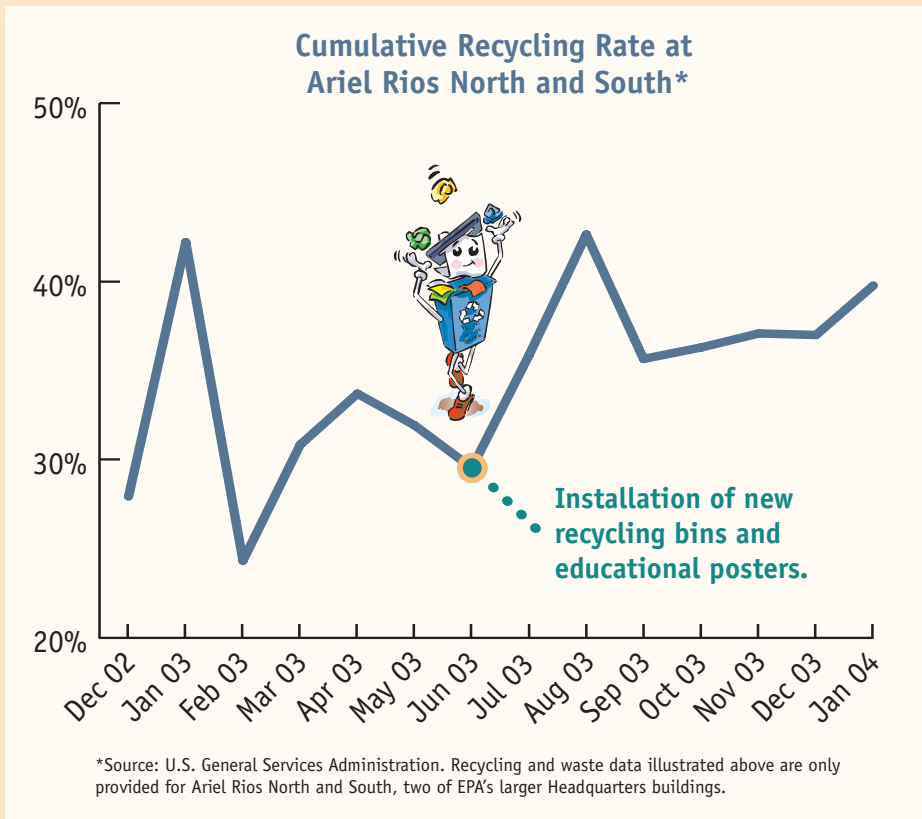
recycled-content and other environmentally preferable products. Designed to create a one-stop shop for EPA purchase card holders, the BPA includes non-electronic desktop supplies, such as recycled-content paper, pencil holders, paper clips, and remanufactured toner cartridges. The BPA also includes special emphasis on products that fulfill both the federal Comprehensive Procurement Guidelines for buying recycled-content products and the Executive Order 13101 mandate to purchase environmentally preferable supplies. The BPA will be phased in during 2004 and will be mandatory for all EPA offices nationwide by October 2004.

**Environmentally preferable and recycled-content office supplies on display at EPA Headquarters.**



## Renewed Commitment to Recycling

Beginning in June 2003, the Agency began rolling out a revamped recycling program at its national Headquarters facilities in Washington, D.C., and Northern Virginia. The program has achieved its goals of: standardizing the recycling procedures for all EPA Headquarters buildings; maximizing the amount of materials recycled; minimizing the contamination of recyclables; and boosting employee participation through a comprehensive outreach campaign.



Initially focused on items generated in the highest quantities—mixed office paper, newspaper, glass and plastic bottles, cans, and corrugated cardboard—EPA has added toner cartridges and an organic materials composting pilot program.



To make recycling as easy for employees as possible, the program includes clearly marked collection bins placed at convenient locations. To encourage employee participation, an outreach program was developed—including kickoff events, posters, handouts, videos, deskside recycling boxes, a new intranet site, and a mascot named “Slim Bin.” To ensure effectiveness, EPA conducts periodic assessments of recycling procedures and works to remedy any program deficiencies.

Revitalizing EPA Headquarters' recycling program has helped increase the amount of material collected.

All EPA facilities also continue to follow requirements to purchase 100 percent recycled-content paper with a minimum of 50 percent post-consumer content and to make great strides in supporting other recycled-content products, including re-manufactured toner cartridges, re-refined oil, and concrete. Maintaining support for these initiatives, EPA conducts purchase card training courses every year, which address “buying green” for purchase card users and other acquisition personnel. In FY 2003, more than 1,900 EPA purchasers attended these training classes.

The past year also saw more traditional recycling collection programs revitalized throughout the Agency. In addition to the

improved Headquarters recycling campaign (see previous page), a number of regional labs and offices enhanced their recycling programs in 2003. For example, a recycling station was installed in the cafeteria at Cincinnati’s A.W. Breidenbach Environmental Research Center, one of EPA’s largest facilities. The National Health and Environmental Effects Research Laboratory in Duluth, Minnesota, started a waste food composting program, and the New England Regional Office in Boston expanded its recycling program (which already included cardboard, binders, and computers) to incorporate battery collection. The office also held a special cell phone and sneaker collection event on Earth Day 2003.

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## Acknowledgements

This document has been compiled from several EPA annual reports required under the Executive Orders listed on page 3. In order to compile these environmental performance results, the Agency relies heavily on a nationwide network of Headquarters, laboratory, and Regional office personnel to collect, analyze, and summarize data. Though too numerous to list by name here, EPA would like to acknowledge the following staff for their contributions to this report and their tireless commitment to improving the Agency’s environmental performance:

- Assistant and Regional Administrators.
- Safety, health, and environmental management and sustainable facilities personnel.

- Energy, facility, fleet, and laboratory managers.
- Pollution prevention, EMS, and recycling coordinators.
- Purchasing and contract officials.

Photos provided courtesy of:

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Field scientists with EPA's Western Ecology Division in Corvallis, OR, go to great lengths (and heights) for their work.

