United States Environmental Protection Agency

EnergizingEPA

Office of Administration and Resources Management's Newsletter on Energy Conservation and Sustainable Facilities

November 2002

EPA has embarked on a new initiative to improve water efficiency in its laboratories and office buildings, as part of its ongoing effort to improve environmental performance, conserve resources, reduce utility costs, and meet federal requirements under Executive Order 13123, *Greening the Government Through Efficient Energy Management*. From reducing leaks and eliminating irrigation to upgrading mechanical systems and employing recycling technologies, the Agency is committed to increasing water conservation across all of its facilities.

EPA Laboratories Conserve to the Last Drop

Chelmsford, Fort Meade Lead Water Efficiency Initiative

Executive Order (E.O.) 13123 requires all federal agencies to report baseline water use at their facilities and establish goals for water conservation. The Executive Order requires each agency to reduce potable water use by implementing the Order's 10 best management practices—including low-flow sanitary fixtures, optimizing cooling tower systems, reuse/recycling, and water-efficient landscaping. By the end of 2002, EPA must have water management plans incorporating at least four of the 10 best management practices in 5 percent of its facilities (or two of the labs it owns and operates). Labs in Chelmsford, Massachusetts, and Fort Meade, Maryland, are leading the way in implementing these best management practices and implementing water management plans that meet the criteria in E.O. 13123.

EPA's **New England Regional Laboratory** in Chelmsford, Massachusetts, exemplifies several of the best management practices called for in E.O. 13123. To reduce water needs before the facility opened in October 2001, EPA worked with designers to specify a number of conservation technologies. All the restrooms have low-flow sinks with automatic flush valves, and some of the men's rooms will soon have waterless urinals. EPA also installed a rooftop rain recovery system that diverts water from storm drains to onsite wetlands. The Agency reduced the area of lawn on the site covered with grass and landscaped mostly with native plants and organic mulch, and a well on the site supplies nonpotable water as needed for irrigation. In addition, facility employees and janitorial staff are trained in water conservation measures, such as reporting and immediately correcting leaky faucets.

Native plant landscaping in Fort Meade, MD.

EPA's **Environmental Science Center** in Fort Meade, Maryland, opened in February 1999. Native plants were planted or maintained on the 24-acre site, reducing the need for irrigation. Low-flow toilets, urinals, faucets, and showerheads were installed throughout the facility, and leaks are reported and handled immediately through a facility hotline. Use of single-pass cooling has been eliminated from laboratory processes and point-of-use closed-loop chillers are used in labs where water cooling is required. On the mechanical side, the cooling tower system is carefully maintained to achieve a high degree of water recycling.

Following are a few more examples of ways EPA labs have cut back on water use and promoted water efficiency:

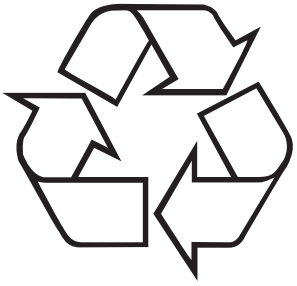
- **New RTP Campus.** EPA incorporated water-efficient fixtures throughout the laboratory campus that was dedicated in May 2002 in Research Triangle Park, North Carolina. Lab sinks have flow-restricting nozzles, automated shutoff, and automatic

continued on page 2

Region 5 Recycles "Anything That Rips"

EPA's Region 5 and the General Services Administration (GSA) have united to create a closed-loop paper recycling program for the federal Metcalfe Building in Chicago. Through a paper recycling program known as Anything-That-Rips, the approximately 2,200 federal employees at the Metcalfe Building can recycle all of their paper (high- and low-quality)—literally, anything that rips.

Recycling was already commonplace in the Metcalfe Building, but the sorting and maintenance of the high-grade paper was cost-prohibitive and participation was limited. "Imagine that you're the manager of a 26-story, multi-tenant federal building attempting to persuade 2,200 tenants to separate white paper, mixed paper, corrugated cardboard, newspapers, magazines, bottles, and cans for recycling," said Rich Hoffman, a program analyst and recycling coordinator for EPA's Region 5. "Not only that, but the janitorial employees must keep those items separated all the way to the loading dock. That's a lot of work for the limited amount of money these commodities fetch in today's recycling market."



By making participation easy and collecting all grades of paper, EPA and GSA have increased the building's collection rate by 200 percent over the previous year's paper separation program, and have fully closed the recycling loop. Every month, GSA collects 18 tons of mixed paper, which is sent to Kimberly Clark Corporation and manufactured into new products such as towels and tissues. GSA then buys back these products to stock the Metcalfe Building.

A month-long study conducted by Region 5 found that the quality of these new towels and tissues exceeds the material that was previously purchased. According to Hoffman, "The response from our employees to these new products was outstanding."

The new recycling program is also saving money. Under the previous collection program, janitorial staff had to sort paper three hours per day to achieve various levels of collection purity. GSA now saves nearly $5,500 each year avoiding this task. In addition, GSA realizes the financial advantage of purchasing paper products made from the building's recycled material—the recycled products are less costly—and its contractor saves $12,900 a year in avoided disposal fees by reducing paper waste. According to Hoffman, through this closed-loop program EPA is helping to keep the majority of its paper materials out of the waste stream and has become a model for other recycling programs.

For more information, contact Rich Hoffman at 312 886-6116 or <hoffman.rich@epa.gov>.

EPA Labs Conserve Water

continued from page 1

temperature controls for hot and cold water. The restrooms have sensor-operated metered faucets that regulate water flow, which saves water and the energy needed to heat it. In addition, the campus is landscaped with native plants and wild flowers that grow naturally in the existing climate, requiring little maintenance and reducing the need for watering.

- **Region 10 Laboratory.** Sometimes upgrades to a facility's mechanical systems can result in major water savings. In June 1998, EPA's lab in Manchester, Washington, replaced its four-inch PVC water lines with six-inch ductile iron ones. The bigger, stronger lines reduce the frequency of leaks, which reduces the lab's overall water consumption rate. The lab also replaced a 20-year-old water cooling tower in October 1999 with a new, more efficient tower, which reduced the water volume needed to run the cooling system. These upgrades have cut the facility's water consumption by 66 percent, from 204,000 to about 70,000 gallons per month.

- **Kansas City Science & Technology Center.** EPA is building a new lab in Kansas City, Kansas, that will "harvest" rainwater from the roof and condensate from the cooling coils in its air conditioning system. The rooftop rain recovery system catches and filters rainwater to use in toilets and as makeup water for the facility's cooling tower. During the summer, it is estimated that the cooling tower will need approximately 10,000 gallons of water per day to provide cooling to the building's chiller. In addition to rainwater, the facility will capture condensate, or the "sweat" from the cooling coils in air conditioning units and recycle it into make-up water for the cooling tower.

Even with numerous best management practices in place at several of its facilities, EPA is continuing to review its labs' water use and look for ways to improve conservation. The Office of Administration and Resources Management (OARM) is assessing several facilities' water use and management practices and, as part of the Agency's Safety, Health, and Environmental Management auditing process for each of its buildings, OARM also evaluates water use and recommends conservation strategies. As it strives to reach E.O. 13123's ultimate goal of water management plans in 80 percent of facilities by 2010, OARM can support all major EPA facilities in developing water management plans. For more information, contact Dan Amon in the OARM Sustainable Facilities Practices Branch at 202 564-7509 or <amon.dan@epa.gov>.

DER Diversifies EPA's Energy Portfolio

As a way to diversify their energy supply and reduce reliance on traditional energy sources, several EPA facilities are now using distributed electrical resources (DER). DER, or off-grid electrical sources that cover a variety of onsite power generation alternatives, offers several distinct advantages over traditional electric power:

- Improves the reliability and quality of a facility's power supply
- Provides redundancy or "backup"
- Taps into renewable resources
- Reduces emissions
- Puts less pressure on the regional electrical grid
- May have lower life cycle costs

Recent changes in the electric utility industry have allowed EPA labs to take advantage of such DER options as natural gas fuel cells, geothermal power, and solar energy.

As part of an energy savings performance contract (ESPC) at EPA's **National Vehicle Fuel Emissions Laboratory (NVFEL) in Ann Arbor, Michigan,** in 2001 the energy service company installed a natural gas fuel cell to provide both base load power and emergency backup power. The fuel cell generates 200 kilowatts of power and provides hot water. By cutting the lab's peak load demand for energy that is dependent on the electrical grid, this effort also reduced the charges that NVFEL pays for electricity.

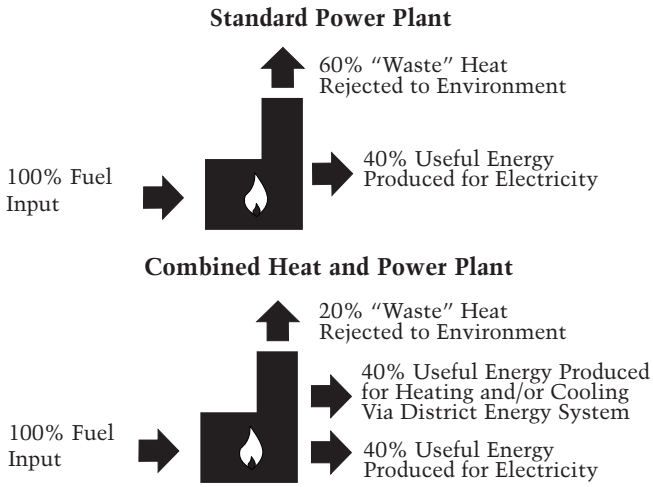
Another ESPC project, the **Robert S. Kerr Environmental Research Center in Ada, Oklahoma,** has installed a ground-source heat pump, which uses the Earth's heat to generate power and will contribute to energy savings of more than 50 percent at the facility once operational in March 2003. The system will provide an alternative source of heating and cooling for the facility for 10 months of each year, reducing the need for a cooling tower to only July and August (the peak season for cooling needs).

EPA's **National Computer Center (NCC) in Research Triangle Park, North Carolina,** installed a photovoltaic roof, one of the two largest on the East Coast. Tiles on the roof use the sun's light to generate 80 kilowatts of electricity—enough electricity to power the entire building's lights. As a result, NCC uses less energy from the regional power grid.

Another way DER helps EPA is by providing a higher quality of energy. "Because of some of the sensitive equipment the labs use, an interruption in power cannot be afforded even for a microsecond," notes Dan Amon, a mechanical engineer with EPA's Sustainable Facilities Practices Branch.

In the future, the Agency may rely even more on DER. EPA is working in partnership with the U.S. Department of Energy's Oak Ridge National Laboratory on feasibility studies for two additional distributed generation projects at NCC and NVFEL. At the NCC, one proposed option was to install a two-megawatt diesel generator for emergency power. After considering alternatives such as a natural gas-fired turbine or fuel cell, however, Oak Ridge determined that a gas-fired turbine could be implemented with a simple payback period of 11 years—and significantly reduce emissions compared to the diesel generator.

DER Efficiency—Combined Heat and Power Example
(Courtesy of DOE)



At NVFEL, Oak Ridge is looking at microturbine and fuel cell options as alternatives to the six or more internal combustion engines that would be needed to provide "clean power," a term for a completely uninterrupted power supply, which is not available from the traditional electric grid. In that case, the payback period of the additional cost over the internal combustion engines was two years. EPA will consider these DER options as the Agency makes its final decisions on backup power for both labs. For more information, contact Dan Amon at 202 564-7509 or <amon.dan@epa.gov>.

New Look for OARM Web Site

EPA's OARM recently revamped part of its public Web site to provide easy access to information on sustainable practices at the Agency's facilities. The site now provides a wealth of data, such as facility square footage, energy and water consumption, facility manager contact information, and "green" building highlights.

OARM renamed this Web site *Greening EPA* to reflect the many efforts EPA is undertaking to live its mission by practicing sound environmental management at its facilities. By updating the site on a quarterly basis, OARM is bringing the most current information available to the public, such as the latest on the Agency's efforts to procure green power for its facilities, and the most recent *Energizing EPA* newsletter. Visit <www.epa.gov/greeningepa> or contact Marjorie Buchanan at 202 564-8206 or <buchanan.marjorie@epa.gov>.

2002 Labs21 Conference Draws Record Attendance

More than 400 laboratory designers, owners, and operators from around the globe convened in Durham, North Carolina, for the 2002 Laboratories for the 21st Century (Labs21) Annual Conference, October 7 to 10, 2002. Attendees worked together to devise new solutions to reduce costs and increase laboratory design and operational efficiency using the principles advocated by the Labs21 Program.

Morris X. Winn, EPA's Assistant Administrator for Administration and Resources Management, opened the conference by noting the importance of the accomplishments of Labs21 and its partners. "Your work, whether for a corporation, a university, or a federal institution, is helping to build the future of research. By making labs energy efficient and environmentally sustainable, you are also protecting and preserving our most critical resource—the environment."

Conference sessions delved into industry-specific topics, including bio-containment facilities, large-animal labs, aeronautics labs, and automotive testing facilities. As a new component, this year's conference also featured a technology fair, displaying state-of-the-art products from nearly 30 vendors.

"As laboratories are places for cutting-edge research, they can be viewed as leaders and agents of change," said Phil Wirdzek, EPA's Labs21 program manager. "By embracing aggressive environmental and energy efficiency goals, these buildings can expand their leadership role and contribute to the commercialization of advanced building technologies and economic growth. These goals were successfully pursued by each attendee and speaker at this year's Labs21 conference."

Assistant Administrator Morris X. Winn welcomes attendees at the recent Labs21 Conference.

Labs21 has announced plans for its 2003 Annual Conference to be held in Denver, Colorado, from October 20 to 23, 2003. More information is available at <www.epa.gov/labs21century> or from Phil Wirdzek at 202 564-2094 or <wirdzek.phil@epa.gov>.

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