

Energizing EPA



Lab Recommissioning Reaps Rewards

In November 2005, EPA opened the First Environments Early Learning Center, a new, state-of-the-art childcare facility at its Research Triangle Park (RTP) campus in North Carolina. The facility was designed to achieve a minimum Silver rating by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) program. The new center includes a number of green features, including an ENERGY STAR®-rated roof, highly reflective concrete paving, energy-efficient lighting features such as occupancy sensors and daylighting dimmers, native landscaping, locally manufactured materials, and indoor air quality monitoring. The 25,400-square-foot facility enables EPA to accommodate a total of 41 staff and 188 children. For more information, visit www.epa.gov/rtp/childcare/daycare.htm.



EPA completed a two-year recommissioning project in November 2005 at its National Enforcement Investigations Center (NEIC) in Denver, Colorado. As part of this effort, EPA evaluated and modified the laboratory's heating, ventilation, and air conditioning (HVAC) system; rebalanced the facility's air flow; and recertified all of the laboratory's fume hoods. EPA also installed a new onsite metering system, which allows the Agency to verify the facility's actual energy use. EPA expects that these actions will help NEIC reduce its energy consumption by approximately 10 to 20 percent and contribute to significant cost savings.

Part of EPA's Office of Enforcement and Compliance Assurance, NEIC conducts field and laboratory work to support the Agency's enforcement of environmental regulations. As one of five federal agencies occupying Building 25 of the Denver Federal Center, a U.S. General Services Administration (GSA)-owned facility, the NEIC consumes considerably more energy than the other tenants due to its energy-intensive laboratory operations and equipment. Prior to the recommissioning project, the NEIC's energy use was unmetered, and GSA billed EPA for its energy use based on engineering estimates. This billing arrangement gave EPA an incentive to evaluate its energy performance and develop the ability to verify its actual energy use.

As a first step in the recommissioning process, the NEIC facilities and operations staff identified laboratory equipment, air vents, and exhaust points that were no longer in use. After receiving full approval from laboratory management and the safety, health, and environmental management



To save energy and reduce air flow, 18 articulated snorkel exhaust hoods were removed during a recommissioning project at EPA's NEIC laboratory.

staff, EPA removed numerous unused instrument vents and canopy hoods. Following additional safety testing, EPA also removed 39 wall-mounted slot vents and 18 articulated snorkel exhaust hoods that were ineffectively capturing air from work spaces, rerouted several exhaust points from the wall to the general ceiling exhaust, and adjusted the fume hood exhaust settings during evening hours. EPA expects these modifications to reduce the volume of air flowing through the facility by 40 percent.

Following these substantial modifications to NEIC's ventilation configuration, the operations staff rebalanced the air flow in all occupied spaces to ensure continued safety and comfort and achieve optimal HVAC performance. As part of this effort, EPA reset the HVAC control valves to compensate for reduced air flow. Once the laboratory was properly rebalanced, EPA then recertified each fume hood to meet EPA performance and safety requirements. To track and verify its actual energy consumption, EPA installed



New Wireless Sensors Improve Comfort and Energy Efficiency

EPA's Mid-Continent Ecology Division Laboratory in Duluth, Minnesota, tested a new wireless temperature sensor system earlier this year that has not only improved employee comfort by enhancing control of indoor air temperatures, but has the potential to increase energy efficiency and cost savings.

EPA partnered with the Pacific Northwest National Laboratory (PNNL), with funding by the U.S. Department of Energy's Federal Energy Management Program (FEMP), to use the Duluth facility as a demonstration site for FEMP's New Technology Demonstration Project. The project tests new, commercially available technology that has yet to be broadly adopted, with the goal of improving energy efficiency. FEMP's program provides equipment, engineering services, and analysis to execute new projects in coordination with federal agencies that offer in-kind support and share outcomes and best practices with other federal facilities.

In March 2005, EPA and PNNL installed 37 wireless sensors in laboratory offices and corridors in two wings of the main laboratory building at EPA's 89,000-square-foot facility. One repeater (which replicates the sensor's signal) was installed on each floor of the building and a receiver and translator (which integrates the wireless temperature sensors



Wireless sensors provide additional control and efficiency gains at EPA's Duluth facility.

into the building's existing HVAC control system) were installed in the building's mechanical room.

In addition to demonstrating the technology's ability to transmit and receive wireless signals throughout the building, the project produced the following test results:

- **Significant cost savings are achievable for building temperature monitoring, particularly in retrofit/building renovation situations.** Installation costs typically represent 20 to 80 percent of the cost of sensors and controls in an HVAC system. Installation of the wireless sensors, however, does not require labor costs for running wires or hiring an electrician, dramatically reducing the overall installed system cost. The entire hardware cost for Duluth's wireless technology was less than \$5,000, and the system was installed and integrated into the existing

HVAC system in less than one day.

- **Wireless sensors can be used effectively as a diagnostic tool to maintain the high performance of an HVAC system.** Several wired-in sensors were discovered to be out of calibration, which was resulting in higher heating and cooling costs than necessary.
- **Better spatial information about the building allows for finer comfort monitoring.** Hot and cold spots in the building can be identified and resolved quickly to improve occupancy comfort.
- **More sensors deliver more timely, higher-resolution feedback for building operators, who can establish more energy-efficient building operations.** Due to improved monitoring, the Duluth laboratory's temperature set point was increased by two degrees during summer occupancy, decreasing the amount of energy used for air conditioning. The Duluth facility is now considering purchasing and installing additional sensors to wirelessly monitor temperatures in the aquaria that are vital to its ecological testing operations.

For more information, contact Rod Booth at (218) 529-5040 or <booth.rod@epa.gov>, or Michael Kintner-Meyer at (509) 375-4306 or <michael.kintner-meyer@pnl.gov>.

Green Your Office Move

Moving to a new office typically requires a lot of work and can create volumes of unnecessary items in your wastebasket. You can help minimize the amount of waste generated during an office move or renovation by recycling or reusing excess, outdated, and unused materials.

Paper and office supplies: Before a move or renovation, employees should conduct major file cleanups and purge

unwanted paper, files, and telephone books. Most paper can go into mixed office paper or newspaper collection containers. Paper should be separated from plastic, including supplies such as binders and clips, which can be reused. Take old office supplies with you when you move, or set up a reuse collection for items others can use. Ask your facility manager for extra boxes or recycling containers that are big enough to handle the large quantities of materials that will be collected during the move or renovation.

Toner and inkjet cartridges and

batteries can be recycled through EPA's Blanket Purchase Agreement (see <www.epasupplies.com>). Ask your recycling coordinator or facility manager if CDs and tapes can also be recycled. Even if you are not moving, office "clean sweeps" are a good idea. EPA's Region 8 office routinely holds a cleanup campaign, during which employees recycle a variety of materials, including phone books, mixed paper, used office supplies, and unwanted personal and household items.



More Green Power from Coast to Coast

EPA continues to demonstrate its commitment to renewable energy by finalizing contracts to purchase 26.3 million kilowatt hours (kWh) of green power for five of its facilities. With these new purchases, the Agency is now under contract to purchase nearly 247 million kWh of green power annually, or approximately 83 percent of its electricity consumption—enough renewable energy to power more than 9,000 homes for a year. The amount of annual carbon dioxide emissions offset by these purchases is equivalent to removing approximately 44,000 cars from the road.

The two new green power contracts and three replacement contracts are in the form of renewable energy certificates (RECs), which help offset the environmental impacts of conventional electricity generated by fossil fuel combustion. The RECs will offset 100 percent of the annual electricity consumption at all five facilities. With its new green power contracts, EPA now ranks second in terms of total green power purchases among the more than 600 partners participating in the Agency's voluntary Green Power Partnership (www.epa.gov/greenpower).

In early August, EPA worked with the Defense Energy Support Center (DESC) to finalize new, one-year contracts with Basin Electric Power Cooperative for two facilities—the Region 5 office in Chicago,

Illinois, and the Environmental Science Center (ESC) in Fort Meade, Maryland. The Region 5 office will receive 9 million kWh in RECs, and the ESC will receive 6.4 million kWh in RECs. Both purchases support the Edgeley/Kulm wind power project in Lamoure County, North Dakota, and the Hyde County wind project in South Dakota.

Also in August, EPA replaced recently expired green power contracts with new, three-year agreements (through DESC) for the New England Regional Laboratory (NERL) in Chelmsford, Massachusetts, and the Region 2 laboratory in Edison, New Jersey. NERL had been receiving 1.9 million kWh in RECs per year since September 2001, but under the new contract with Select Energy, the laboratory will receive 3 million kWh in RECs annually. The Region 2 laboratory also increased its green power purchases from 4.5 million kWh per year in RECs since September 2003, to 6 million kWh on an annual basis. The purchases support wind power generation at the Foote Creek III facility in Carbon County, Wyoming, as well as the Edgeley/Kulm wind power project in Lamoure County, North Dakota, and the Hyde County wind project in South Dakota.

EPA also replaced the green power contract for its Region 9 laboratory in Richmond, California, with a new, three-



Recent green power purchases for five EPA facilities support wind power projects such as the Edgeley/Kulm wind power project in North Dakota.

year agreement (through DESC) with 3 Phases Energy Services. Although the laboratory has been purchasing green power since October 1999, the new contract increases its annual supply of RECs to 1.9 million kWh per year. This purchase supports the generation of renewable energy at wind farms in both northern and southern California.

For more information on EPA's green power purchases, or to learn more about renewable energy certificates, visit www.epa.gov/greeningepa/greenpower.htm or contact Justin Spenillo at (202) 564-0639 or jspenillo@epa.gov.

Carpet: During an office renovation, carpet typically needs to be replaced. EPA encourages offices to recycle their old carpet, either by returning it to the original manufacturer through a "take-back" program or through some other type of recycling program. When purchasing new carpet, make sure to include a "take-back" clause in the contract. EPA's Region 5 office recently recycled 426,000 square feet of used carpet by returning the carpet to the original manufacturer. Visit the Carpet America Recovery Effort (CARE) program Web site at www.carpetrecovery.org for

more information.

Electronics: It is also important to properly dispose of unwanted or unused electronics because they can release toxic chemicals. Reuse, recycling, and proper disposal can keep many of these pollutants out of landfills and incinerators, which helps protect the environment. One way of making sure unwanted electronic products are properly handled is to use the Recycling Electronics and Asset Disposition (READ) government-wide acquisition contract.

READ provides all federal agencies with an easy way to properly manage

electronic inventories and to recycle and properly dispose of obsolete electronics. Through READ, a pool of qualified contractors that specialize in asset management services ensure that the electronics are either refurbished and resold, donated to charitable causes, recycled, or properly disposed. Programs should budget for the cost of READ; to date, participants have been charged \$2 to \$3 per electronic component, depending on size. For more information on how to use the READ contract, contact Oliver Voss at (202) 564-4514 or voss.oliver@epa.gov.



Labs21 Conference Grows Larger, Greener in Portland

Numerous local organizations helped make this year's Laboratories for the 21st Century (Labs21) 2005 Annual Conference in Portland, Oregon, the largest and greenest to date. From October 18 to 20, nearly 550 architects, engineers, federal employees, facility managers, and other laboratory professionals converged at the Oregon Convention Center—a facility certified by the U.S. Green Building Council's Leadership in Energy and Environmental Design for Existing Buildings (LEED®-EB) Rating System—to discuss the latest in sustainable laboratory design and construction.

Prominent speakers from EPA and the U.S. Department of Energy (DOE) kicked off the conference during the opening plenary session. Brian Conner from DOE's Federal Energy Management Program provided an overview of the ways Labs21 can help the federal sector meet the goals of the Energy Policy Act of 2005. Luis Luna, Assistant Administrator for EPA's Office of Administration and Resources Management, issued a challenge to conference attendees to get involved in Labs21 to help save money, improve laboratory performance, and have a lasting impact on the natural environment. Dr. Dan Arvizu, Director of the National Renewable Energy Laboratory (NREL), delivered a keynote address on the role of innovative renewable



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Opening plenary speakers at the Labs21 conference, from left top: Luis Luna, EPA; Dr. Dan Arvizu, NREL; Michael Grainey, Oregon Department of Energy; from left bottom: Brian Conner, DOE; Margie Harris, Energy Trust of Oregon; David Lloyd, EPA.

energy technologies in diversifying the nation's energy supply, as well as the range of exciting applications for these technologies in laboratories.

Two pre-conference courses—which included the first-ever Labs21 “advanced” course on optimizing laboratory ventilation—were offered this year. The conference also included a technology fair, which featured 40 manufacturers of high-performance laboratory equipment, and for the first time was open to Labs21 Supporters. Other conference events included more than 50 technical sessions, a poster session, and evening tours and receptions.

In particular, an evening tour of

Swindells Hall at the University of Portland allowed attendees to venture off site to a three-story, 42,000-square-foot laboratory that is considered a model for environmentally sustainable design, planning, and construction. Attendees were able to see “intelligent” fume hoods, an indirect evaporative cooling system, and the use of recycled glass for bathroom tiles and counter tops, among other sustainable features.

Attendees also participated in engaging breakfast sessions that addressed such hot topics as the new Energy Policy Act of 2005, sustainable hospitals, energy efficiency in cleanrooms, commissioning, and LEED for Labs.

New to this year's conference were the highly successful “Roll Up Your Sleeves” Roundtables. These two sessions provided an informal atmosphere for design teams to lay out their new laboratory designs and receive advice from technical experts in the audience. Presenters took away valuable feedback on how to further improve the energy performance of their facilities.

Plans are already taking shape for the Labs21 2006 Annual Conference, scheduled for October 17 to 19, 2006, in San Antonio, Texas. For more information about the Labs21 conference and program, visit <www.labs21century.gov>.

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three electricity meters, two chilled water meters, and two high-temperature hot water meters on site, which allow the Agency to be billed for actual energy use.

EPA expects that these modifications will enhance the overall safety and performance of laboratory operations and result in annual energy savings of 9.5 billion British thermal units (Btus) and cost

savings of \$100,000 each year—enough to pay for the cost of the upgrades over a two-year period.

For more information about the NEIC recommissioning project, contact Jon Yeagley at (303) 462-9017 or <yeagley.jon@epa.gov>, or Dan Amon at (202) 564-7509 or <amon.dan@epa.gov>.

Contact Us

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