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DOE Pulse

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NETL mercury control patent licensed to private industry

DOE's National Energy Technology Laboratory ((NETL) recently issued a license to Mobotec, USA, Inc., of Walnut, Calif., to commercially develop a promising low-cost mercury control technology termed the Thief Process. The process is a cost-effective alternative to activated carbon because it produces thermally activated sorbents by extracting partially combusted coal. Since the cost of coal is relatively inexpensive, the cost of the Thief sorbent is estimated to be between $90 and $250 per ton, much less than the estimated $500 to $3,000 per ton of activated carbon. The Thief Process was patented by five NETL researchers.

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Efficient "can" lights open opportunities for energy savings

DOE's Pacific Northwest National Laboratory is working to improve the efficiency of popular "can" lights or "downlights." The widespread use of recessed cans and their inefficiency creates a great opportunity to reduce energy consumption and operating costs by using efficient compact fluorescent lamps and redesigning fixtures. PNNL researchers are working on two projects, one to improve performance of reflector-type CFL replacement lamps, and another to redesign fixtures that are hard-wired for CFLs. The program aims to increase the availability of these products and reduce the cost in the marketplace. To date, three CFL reflector lamps have passed PNNL's stringent 6,000 hour elevated temperature life testing procedure. A new round of testing begins this fall.

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Coding system 'tags' textiles' origins

A textile marking system developed at DOE's Oak Ridge National Laboratory that encodes information invisible to the naked eye could save the U.S. millions of dollars in revenue lost each year to counterfeiters and violators of trade laws. Some manufacturers routinely falsify country-of-origin certification to avoid paying those taxes. The coding system could put an end to the deception. The marker, which can be read only by special scanners, identifies the source, type, production conditions and composition of textile material. The system is based on a near-infrared material that can be used either as a marker, geometric figure or a bar code with millions of letter and number combinations.

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Enzyme cost reduced through collaborative agreement

DOE, its National Renewable Energy Laboratory and Novozymes were able to successfully reduce the overall enzyme cost of the conversion process of corn stover to 10-18 cents per gallon of ethanol in laboratory trials. This more than 30-fold reduction from the starting point of more than $5 per gallon combines pre-treatment technology developed by NREL and novel enzyme solutions from Novozymes. A collaborative research subcontract was entered into by the three organizations in 2001. Novozymes intends to further develop the enzyme technology as a supplier of enzymes and technology to leading industry players in the fuel ethanol industry.

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DOE Pulse highlights work being done at the Department of Energy's national laboratories. DOE's laboratories house world-class facilities where more than 30,000 scientists and engineers perform cutting-edge research spanning DOE's science, energy, national security and environmental quality missions. ***DOE Pulse*** (www.ornl.gov/news/pulse/) is distributed every two weeks. For more information, please contact Jeff Sherwood (jeff.sherwood@hq.doe.gov, 202-586-5806).

Multiple agencies study urban air dispersion

On a cold, clear morning in early March 2005, a team of approximately 75 scientists, students and federal and local officials gathered at the New Yorker Hotel for a final briefing before heading out into the streets around Madison Square Garden for the first day of a field study on air dispersion in an urban environment.

Brookhaven scientists worked with students from Medgar Evers College on the Urban Dispersion Program March field study in New York City.

New York City, with its tall buildings and deep canyons, was an ideal setting for the study, sponsored by the Department of Homeland Security, with additional support from the Defense Threat Reduction Agency of the Department of Defense and the Department of Energy. Data gathered from the study will help improve existing models of how a gas or chemical release might move around Manhattan.

Emergency management, law enforcement and intelligence personnel use these models to plan for, train for and respond to potential terrorist attacks and accidents involving toxic materials. The March field work, coordinated by DOE's Pacific Northwest National Laboratory through the New York City Office of Emergency Management, involved detailed meteorological observations, tracer gas releases, and tracer sampling.

The primary field efforts were accomplished by DOE's Brookhaven National Laboratory, with support from PNNL, the U.S. Environmental Protection Agency, the U.S. National Weather Service, Stony Brook University, Harvard University and Stevens Institute of Technology. The study also offered an opportunity for hands-on training of future engineers and environmental scientists through a partnership with the New York City College of Technology and Medgar Evers College.

Two additional and broader tests, scheduled for later this summer and spring 2006, will add to the team's knowledge of how weather conditions in spring and summer will affect air dispersion. For those broader studies, the collaborator list will grow to include Argonne National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, two divisions under NOAA Air Resources Laboratory, and the Naval Research Laboratory.

Submitted by DOE's Brookhaven National Laboratory

Researchers from Europe bring love of soccer

DOE's Oak Ridge National Laboratory, which is in the last stages of a building campaign, has provided some valuable real estate for a growing segment of its laboratory population: Soccer players. Soccer, of course, reflects the increasingly international flavor of the research community. Two of ORNL's soccer enthusiasts (or football, as it is known outside the United States) came to the laboratory as Eugene P. Wigner fellows: Thomas Maier and David Silvermyr.

Thomas Maier and David Silvermyr

Maier arrived at ORNL in as a postdoc via the University of Cincinnati and Germany. He has since joined the staff's Computer Science and Mathematics Division with an interest in condensed matter theory, more specifically computer simulations of high-temperature superconductors.

Silvermyr, a current Wigner fellow, hails from Sweden. He is currently working with the lab's PHENIX detector team for the Relativistic Heavy Ion Collider, searching for the J/psi particle. Maier, the more serious player of the two, participates in a mens' league in nearby Knoxville.

"I play the mid-field position. Over here they call it halfback," he says. In Germany Maier played in leagues that feed more professional teams with players, similar to American baseball, before stopping because of injuries. But his teams "won the leagues," he says. Silvermyr, a native of Sweden, uses ORNL's new soccer field to take a break from his High Energy Reactions group's research. The soccer field is just outside the Physics Division's offices.

"People get together to play three times a week," Silvermyr says.

"Two days a week we play at noon and one day we play at 4 p.m." A wet spring and summer made for soggy conditions but didn't dampen the desire to play.

"We are just letting the field rest for a while," Silvermyr says.

Submitted by DOE's Oak Ridge National Laboratory