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June 08, 2005

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News and Events

DOE Offers Guide to Building Energy Efficient Homes in the Southwest

DOE has issued a free guide to the construction of energy-efficient homes in the arid climate of the southwestern United States, a region that stretches west from central Texas and the Oklahoma panhandle, encompasses southern New Mexico and Arizona (including parts of Colorado, Utah, and Nevada), and extends into the non-coastal parts of California, continuing north to near the Oregon border. The second guide in the Building America Best Practices series, "Volume 2: Hot-Dry, Mixed-Dry," released on May 31st, addresses the challenge of maximizing energy efficiency while preserving the comfort of homes in both hot and dry climates and in dry climates with a mix of hot and cold weather. Equipped with this guide, builders and homeowners will be able to build high-quality, energy-efficient homes in such climates, saving 30 percent in space conditioning and water heating each year. See the [DOE press release](#).

As part of a continuing effort to provide consumers guidance on saving money through improving home energy efficiency, DOE's regional building guides offer tips to families and contractors on how to build energy-saving homes in different climates across the country. Volume 1 of the Best Practices series, focusing on construction in the hot and humid climate of the South, was published earlier this year. Upcoming releases in this series will include an edition on cold climates, available June 22nd; an edition on humid climates with a mix of hot and cold weather, available July 29th; and an edition on marine climates for coastal and island locations, available in early 2006. The guides are being developed by DOE's Building America program, which conducts and sponsors research and development in building

technologies aimed at improving the comfort and efficiency of U.S. homes. For more details and to download these guides, see the [Building America Web site](#).

Study Finds Huge Potential for White LEDs in the Developing World

Battery-powered lamps using white light-emitting diodes (LEDs) could provide a more cost-effective and energy-saving light source for the developing world, according to a researcher at DOE's Lawrence Berkeley National Laboratory (LBNL). In an article published in the May 27th edition of Science magazine, Evan Mills notes that 1.6 billion people still lack access to electricity and instead rely on low-tech light sources such as candles and kerosene lamps. In addition to being weak and inconvenient light sources, such light sources are also expensive and energy wasteful. According to Mills, the cost per unit of simple kerosene-based lighting is about 600 times higher than lighting from a 1-watt white LED, powered by a nickel-metal-hydride battery and recharged with a solar cell. Mills estimates that fuel-based lighting throughout the world consumes 77 billion liters of fuel annually, at a total cost of \$38 billion per year, or \$77 per household.

Illumination in industrialized countries is available at 1000 times the energy efficiency of lighting sources used in non-electrified households, says Mills. In particular, Mills notes that 1-watt white-light LEDs that are commercially available today can deliver more light to tasks than a 100-watt incandescent light bulb. See the [LBNL press release](#) and the [full article](#), posted on the LBNL Web site.



In



The Lighting Research Center developed this white-light LED system, which produces light more efficiently than today's compact fluorescent lamps.

Credit: RPI

the United States, researchers continue to achieve dramatic gains in the performance of white LEDs, while all types of LEDs are finding their way into new markets. Scientists at the Lighting Research Center at New York's Rensselaer Polytechnic Institute (RPI) have found a way to squeeze more than 80 lumens per watt out of a white-light LED, a higher efficiency than the 60 lumens per watt achieved by today's compact fluorescent lamps. The RPI researchers managed to reduce losses by separating the white-light-emitting phosphors from the ultraviolet-light-emitting semiconductor, thereby causing less ultraviolet light to be lost within the device. The Lighting Research Center has also conducted a marketing study, which found that consumers prefer the use of energy-saving colored LEDs in store window displays. Looking towards more high-tech applications, companies such as Hella, Lumileds, Cree, and Osram Opto Semiconductors, Inc. are developing LEDs for car headlights and taillights and for backlighting systems in LCD monitors and televisions. See the press releases from [RPI](#) and its [Lighting Research Center](#) as well as from [Hella](#), [Lumileds](#), [Cree](#), and [Osram](#).

EPA Requires Ethanol Use in California, Connecticut, New York

The U.S. Environmental Protection Agency (EPA) announced on June 2nd that it will reject petitions made by the states of California, Connecticut, and New York to waive

the oxygen content requirement for reformulated gasoline. The decision effectively maintains a requirement for the three states to use ethanol as a gasoline additive. Although both MTBE (methyl tertiary butyl ether) and ethanol are used as oxygenates to meet the EPA's reformulated gasoline requirements, the three states have banned the use of MTBE and, in the absence of a waiver, must use ethanol instead.

In rejecting the state petitions, the EPA found that neither New York nor Connecticut submitted the technical data necessary for the agency to determine the air quality impacts of a waiver. And although EPA agreed with California's claim that a waiver would lead to a decrease in some vehicle emissions, the EPA concluded that the overall impact on emissions is slight. The agency found that total volatile organic compound and nitrogen oxide emissions are likely to decrease with a waiver, but carbon monoxide emissions are likely to increase. See the [EPA press release](#).

The ethanol fuel industry has had its share of good news lately. In early May, Maryland established tax credits for the in-state production of ethanol and biodiesel when the governor approved Senate Bill 740. And at the end of May, Ohio gained its first ethanol fuel facility when the Liquid Resources plant went online near Medina. The good news should provide plenty to talk about at the 21st Annual International Fuel Ethanol Workshop & Expo, which comes to Kansas City, Missouri on June 28th and continues through July 1st. See Maryland's [Senate Bill 740](#), the [Liquid Resources press release](#) from the Renewable Fuels Association, and the [Fuel Ethanol Workshop Web site](#).

New Process Converts Sugars Into Diesel-Fuel Substitute

Researchers at the University of Wisconsin-Madison announced on June 2nd that they have found a

new way to convert sugars derived from plants into a fuel that could be used as an additive in diesel fuels. In an article in the June 3rd issue of Science magazine, the researchers detail their use of a four-phase catalytic process to react biomass-derived carbohydrates with hydrogen to form sulfur-free liquid alkanes. Alkanes are molecules that contain only carbon and hydrogen with only single bonds between them; alkanes of various lengths make up crude oil, and are the main constituents of gasoline and diesel fuel. The UW-Madison researchers claim that their process will produce alkanes from a variety of plant-derived carbohydrates. Because no heating or distillation is needed to separate the alkanes from the water used in the process, the researchers claim that the alkane fuel embodies more than twice as much energy as is used in the production of the fuel. See the [UW-Madison press release](#).

Food and Paper Industries Pursue Energy Savings

With energy costs near record highs, it's no surprise that a number of industries are trying to find ways to cut their energy use and draw on renewable sources of energy. What may be surprising is the number of ways that industries tackle that challenge.

In the food processing industry, the current focus seems to be on new energy sources and using energy more efficiently. Ocean Spray's plant in Wisconsin Rapids, Wisconsin, is preparing to use methane gas from a nearby landfill to fuel its boilers. Ocean Spray and Onyx Cranberry Creek Landfill have agreed to build a one-mile-long pipeline to supply the landfill gas to the facility, cutting Ocean Spray's fuel costs by 25 percent. The new system should be ready by fall, in time for the cranberry crop. Meanwhile, Energy and Power Solutions, Inc. is preparing to build three large cogeneration plants at dairy food

processing facilities in southern California and Massachusetts. With financing from New Energy Capital Corporation, each project will be fired with natural gas and will produce two megawatts of power while providing heat for food processing. See the press releases from [Ocean Spray](#) and Energy and Power Solutions ([PDF 32 KB](#)). [Download Acrobat Reader](#).

For the paper industry, DOE's Lawrence Berkeley National Laboratory (LBNL) thinks there's a simple answer: producing the right thickness of paper. Currently, paper mills produce 15- to 30-ton rolls of paper at a time, and if a roll fails to meet specifications, the entire roll is recycled or sold as inferior grade. To avoid that paper loss, LBNL designed and built an innovative ultrasonic laser sensor to measure paper's bending stiffness and shear strength as it speeds through the mill. The sensor recently proved its ability in a two-week test at a Boise Cascade mill. According to LBNL, the new sensor could reduce the consumption of trees and chemicals and save U.S. paper mills about \$200 million in energy costs and \$330 million in fiber costs each year. See the [LBNL press release](#).

The paper industry is part of the forest products industry, one of eight energy-intensive industries that DOE's Industrial Technologies Program is focusing on through its Industries of the Future effort. See the [Forest Products Industry of the Future Web page](#).

South Korea to Build World's Largest Tidal Energy Plant

VA Tech Hydro announced in late May that it will supply the main components for what will be the world's largest tidal energy plant, the 260-megawatt Sihwa Lake Tidal Power Plant in South Korea. The facility will dam the flow of water from the ocean into Sihwa Lake, creating power at high tide as the ocean flows into the lake, but

allowing the unrestricted flow of the water back into the ocean during low tide. According to the company, this arrangement will also increase the water quality in the lake. Daewoo Engineering & Construction is leading the project, which the companies expect to complete by 2009. See the [VA Tech Hydro press release](#).



SMD Hydrovision will soon make a full-scale version of this prototype tidal energy device.

Credit: SMD Hydrovision

Meanwhile, the U.K. Department of Trade and Industry announced a grant of nearly \$5 million (2.7 million pounds) to SMD Hydrovision for the development of its tidal stream device, the TidEl. The propeller-driven device captures tidal flow energy while submerged in the ocean and moored to the ocean floor. According to SMD Hydrovision, a scale model successfully completed a seven-week trial, and the new grant will be used to develop a full-scale one-megawatt grid-connected system. The unit will be installed and tested next year at the European Marine Energy Center's Tidal Test Site, located near Stromness on the northern Scotland island of Orkney. See SMD Hydrovision's [press release](#) and [TidEl Web page](#).

Site News

World Green Building Council

The [World Green Building Council](#) serves the real estate and development industry to help

transform it into a sector in which sustainability is a core value. The Web site is a source of information, news, data, and opinion about green building practices and developments worldwide. The site also promotes international sustainability events and provides a roadmap for other countries aiming to set up their own not-for-profit council.

Energy Connections

DOE Offers Energy-Saving Tips to Cut Summer Cooling Bills

Summer is coming soon, and with many parts of the country already experiencing hot days, DOE is offering easy tips to save money and energy while keeping cool. By following a few common sense guidelines, you can cut your summer energy bills by 10 to 50 percent. The energy-saving tips cover such topics as wisely using fans and air conditioning, landscaping for energy efficiency, shading your windows, and weatherizing your home, as well as other low-cost tips to save energy. See the tips and other useful links in the [DOE press release](#).

The Alliance to Save Energy and the U.S. Environmental Protection Agency (EPA) are also offering tips to save energy this summer. See the [Alliance to Save Energy press release](#) and see the EPA press release and related documents on the [Energy Star Web site](#).

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