Two R&D 100 Awards for Biomass and Solar Breakthrough Technologies

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Two technologies developed by the U.S. Department of Energy's National Renewable Energy Laboratory are among this year's most significant innovations, as judged by Research & Development (R&D) Magazine.

The Laboratory's two R&D 100 Awards for 2004 are for an innovative, lower-cost method for transforming plant material into the sugars that can be used to make fuels and chemicals, and a thin-film solar cell that produces electricity directly from sunlight, which has greater efficiency, and is lighter weight and more flexible than previous devices.

This year's announcement brings to 37 the number of R&D 100 Awards garnered by NREL.

"Once again, the technologies developed by our Laboratory's researchers are being acknowledged for their importance to the nation," said Stan Bull, NREL associate director for science and technology. "It's particularly gratifying that the R&D 100 Awards this year include two NREL technologies that can enhance our nation's energy security and reduce our reliance on foreign sources of oil."

The Enzymatic Hydrolysis of Biomass Cellulose to Sugars technology is expected to allow a wide range of biomass resources to be used to produce energy and chemicals. It is an important step toward realizing the potential of bio-refineries—in which plant and waste materials are used to produce an array of fuels and chemicals, analogous to an oil

refinery today.

Through this technology, the cost of converting cellulosic biomass into usable sugars can be reduced by more than 20 times per gallon of ethanol produced.

The award is shared by NREL, Genencor International and Novozymes Biotech, Inc. NREL researchers who worked on this project included Michael Himmel, Jim McMillan, Dan Schell, Jody Farmer, Nancy Dowe and Rafael Nieves.

Also recognized for 2004 are light and flexible thin-film copper indium gallium diselenide (CIGS) photovoltaic modules, which can be manufactured in various sizes and have a compact, foldable design that allows for easy deployment, transport and storage.

As a result, the modules have twice the power-to-weight ratio, and three times the power-to-size ratio as competing products. Because of this, they are especially suited for military applications, portable power for consumer and public use, boating and other marine applications and building-related uses, such as for bus shelters and in PV-integrated roofing.

The award is shared by NREL, Global Solar Energy and ITN Energy Systems. NREL researchers who worked on this project included Harin Ullal, Ken Zweibel and Bolko von Roedern.

NREL is the U.S. Department of Energy's premier laboratory for renewable energy research and development and a leading laboratory for energy efficiency R&D. NREL is operated for DOE by Midwest Research Institute and Battelle.

Source: National Renewable Energy Laboratory