NREL Takes Two R&D 100 Awards

July 8 2005

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 R&D 100 Awards for 2005 are for a **silicon testing system** that helps manufacturers determine the quality of silicon material in the early stage of solar cell production, and for **energy modeling software** that determines building energy consumption and cost effective energy efficiency upgrades for buildings. This year's announcement brings to 39 the number of R&D 100 Awards earned by NREL.

"NREL's goal is to invest in research that will ultimately benefit consumers while enhancing our nation's energy security and reducing our reliance of foreign sources of oil," said Dr. Dan E. Arvizu, NREL Director and Sr. Vice President of Midwest Research Institute which, with Battelle, operates NREL for DOE. "These technologies will help consumers save energy in their homes and help renewable energy companies make better consumer products."

"These awards demonstrate that DOE scientists and researchers are hard at work developing the technologies of the future," said Secretary of Energy Samuel W. Bodman. "In the past, breakthroughs like these have played an important role in both our economic and national security."

The Sinton QSSPC Silicon Evaluation System is a method of detecting

impurities and defects in silicon boules — the material from which solar cells are made — early in the manufacturing process. A boule tester sends short pulses of infrared light into the boule and measures minority-carrier lifetime in p- or n-type silicon. Using radio frequency (RF) sensing, the tester determines quasi-steady-state photoconductance (QSSPC), then uses this information to calculate the bulk minority-carrier lifetime. Next it calibrates the results of the photoconductance analysis to determine the absolute lifetime and then determines grain structure and calculates levels of unwanted impurities. This process gives manufacturers information to identify substandard silicon before it is made into cells, thereby increasing the number of efficient cells produced, boosting yields and reducing manufacturing costs. The evaluation system will enable the solar industry to keep up with product demand and growth.

The award is shared by NREL and Sinton Consulting, Inc. NREL researchers who worked on this project are David Mooney and Katie Brown.

The energy modeling software, called TREAT 2.6 for Targeted Residential Energy Analysis Tools, is a comprehensive energy analysis tool that models building energy consumption and identifies the most cost effective energy efficiency upgrades for both single-family and multifamily buildings. The tool gives building performance contractors and energy auditors a competitive edge in the areas of accurate energy-use analysis, energy efficiency improvement options and customer confidence. It was developed specifically to address the problem of inefficient and excessive residential energy consumption. To that end, TREAT helps reduce home energy consumption and emission of carbon dioxide and other pollutants to the environment while minimizing home energy costs.

The award is shared by NREL, Taitem Engineering, Performance

Systems Development and the New York State Energy Research & Development Authority. Michael Deru is the NREL researcher for the project.

Source: NREL

Citation: NREL Takes Two R&D 100 Awards (2005, July 8) retrieved 6 May 2024 from https://phys.org/news/2005-07-nrel-awards.html