

NREL In Focus

A Structure for Translational Science

In 2006, NREL created an organizational structure that facilitates work in translational science and reflects the laboratory's commitment to developing sustainable, accessible, affordable energy technologies to power the homes, businesses, and automobiles of the future.

Translational science at NREL focuses on renewable energy and energy efficiency innovations that will most benefit the nation in practical applications. The new organization reflects four main areas of expertise: renewable electricity science and technology, renewable fuels science and technology, basic energy sciences, and strategic analysis. Each area is represented in NREL's R&D and analytical centers.

The Renewable Electricity Science and Technology directorate is home to R&D centers for solar and wind power, distributed power generation, and energy-efficient buildings; it is headed by Associate Director Stanley Bull, who has had extensive management experience in more than 35 years of work in energy-related R&D.

Renewable Fuels Science and Technology is led by Associate Director Dale Gardner, who is experienced in hydrogen systems integration and was formerly a manager at Northrop Grumman Mission Systems. His directorate focuses on R&D in bioenergy, hydrogen, and transportation technologies.

Energy Sciences, headed by Associate Director Ray Stults, includes research centers in basic chemical, material, and biosciences as well as a scientific computing center. His background includes management positions in basic sciences R&D at three other U.S. Department of Energy (DOE) national laboratories: Idaho National Laboratory, Los Alamos National Laboratory, and Pacific Northwest National Laboratory (PNNL).



NREL Associate Directors (left to right) Ray Stults, Bobi Garrett, Stan Bull, and Dale Gardner.

Strategic Development and Analysis focuses on important issues of technology transfer, energy economics, applications, and markets and is led by Associate Director Bobi Garrett, who held several management and program leadership positions at PNNL before joining NREL. ■

NREL Goes "Carbon Neutral"

It's official: NREL is carbon neutral. Because the laboratory purchases 30 million kilowatt-hours of renewable energy certificates annually through DOE's Western Area Power Administration, NREL's activities produce no net greenhouse gas emissions over the course of a year. Certificate purchases offset all the energy NREL uses annually in buildings, vehicles, and day-to-day activities, including the energy used by staff members in commuting and air travel.

This helped to earn NREL a Climate Protection Award from the U.S. Environmental Protection Agency (EPA) in 2006. The award included recognition for NREL's significant analytical contributions to EPA's Mobile Air Conditioning Climate Protection Partnership, which could help reduce automotive carbon dioxide emissions by more than 35 billion kilograms per year.

In addition, NREL produces solar- and wind-generated power on site, uses alternative fuels in fleet vehicles, and helps to design its own energy-efficient buildings. Several facilities feature passive solar heating, natural lighting, energy-efficient equipment, and solar-heated water and ventilation air. Features like these earned NREL's new Science and Technology Facility a federal showcase designation in 2006 from the DOE Federal Energy Management Program.

These are just some of the many staff members who drive hybrid and other fuel-efficient vehicles to and from work at NREL.



Also in 2006, the Office of the Federal Environmental Executive recognized the Sustainable NREL initiative with a White House Closing the Circle Award Honorable Mention. Laboratory Director Dan Arvizu said the award is important in that it reflects NREL's goals for leadership in environmental management and sustainability. ■

NREL and Universities Form New Partnership

To help move clean, affordable energy technologies quickly to markets in its home state and beyond, NREL has joined with three Colorado institutions of higher learning in a new partnership, the Colorado Renewable Energy Collaboratory.

The Collaboratory is made up of renewable energy researchers from NREL, the Colorado School of Mines, Colorado State University, and the University of Colorado, Boulder. The State of Colorado is providing up to \$2 million per year in matching funds for the Collaboratory to pursue federally and privately funded R&D projects over the next three years. Income from spin-off commercial technologies will be used to reimburse the state for the matching funds.

The Collaboratory has already submitted a proposal to DOE for an R&D center for producing solar hydrogen and electricity via photoelectrochemistry, photochemistry, and photobiology. NREL Research Fellow Art Nozik would be the Lead Principal Investigator of a team consisting of approximately 30 NREL scientists, 35 faculty members, 30 graduate students, and 35 postdoctoral researchers. The idea for the partnership emerged from the Renewable Energy Summit hosted in early 2006 by U.S. Senator Ken Salazar of Colorado. ■

President Bush Visits NREL

President George W. Bush visited NREL in 2006 to tour a key laboratory facility and to lead a panel that discussed approaches to achieving the goals of his Advanced Energy Initiative, which aims to develop the foundations for a reliable, affordable, and clean energy future.

The visit began with a tour of NREL's Biochemical Process Development Unit led by Michael Pacheco, director of the National Bioenergy Center. During the tour, the president was given a basic overview of the process of converting cellulosic biomass to ethanol.

Later the president led a panel discussion on the best and most promising alternatives to the use of oil. The panel included NREL Director Dan Arvizu; Larry Burns, vice president, Research and Development, General Motors (GM); Bill Frey, Global Business director, Biobased Materials, DuPont; Dale Gardner, NREL associate director, Renewable Fuels Science and Technology; Patty Stulp, president, Ethanol Management Company; Lori Vaclavik, executive director, Habitat for Humanity of Metro Denver; and Pat Vincent, president and CEO, Public Service Company of Colorado.

President Bush said that dependence on foreign oil is a threat to both economic stability and national security, and he recognized NREL's work as important in developing viable alternatives. He proposed doubling funding for basic sciences research and developing alternative fuels, plug-in hybrids, and hydrogen-powered vehicles as well as advanced electricity generation technologies.

"We're close to changing the way we live in an incredibly positive way," the president said.

During the discussion, Arvizu described some of the exciting progress being made in photovoltaic technologies, and Burns talked about new ways that GM is marketing its considerable fleet of flexible-fuel vehicles. Stulp pointed out how growing corn for ethanol boosts the supply of domestic fuels and creates new markets for America's farmers. Frey cited GM's long partnership with NREL on hybrids and talked about new work to develop biorefineries for producing valuable fuels, chemicals, and materials from biomass.

Vaclavik said Habitat for Humanity has worked with NREL to provide comfortable, affordable homes that use little or no net energy because of their energy efficiency and integrated solar systems. Gardner described the promise of hydrogen technology and current work on producing and storing it cost effectively. Finally, Vincent talked about Public Service's "Windsource" program, advanced wind turbine technologies, and plans for new solar power stations.

The president said that future generations would appreciate the work of these pioneers and entrepreneurs. His visit to NREL was the second by a U.S. president; the first was by former President Jimmy Carter in 1978. ■



Credit: Daniel Hansen, White House

President Bush tours the NREL's National Bioenergy Center and hosts a panel discussion with NREL Director Dan Arvizu.