



Innovation for Our Energy Future

NREL's mission: NREL develops renewable energy and energy efficiency technologies and practices, advances related science and engineering, and transfers knowledge and innovations to address the nation's energy and environmental goals.

History & Background

The National Renewable Energy Laboratory (NREL) is the Department of Energy's primary national laboratory for renewable energy and energy efficiency research and development.

Established in 1974, NREL began operating in 1977 as the Solar Energy Research Institute. It was designated a national laboratory of the U.S. Department of Energy (DOE) in September 1991 and its name changed to NREL.

NREL is the principal research laboratory for the DOE Office of Energy Efficiency and Renewable Energy which provides the majority of its funding. Other funding comes from DOE's Office of Science and Office of Electricity Transmission and Distribution.

NREL is managed for DOE by Midwest Research Institute and Battelle.

National Centers of Excellence

NREL is home to three national centers of excellence: the National Center for Photovoltaics, the National Bioenergy Center and the National Wind Technology Center.

Technical Disciplines

NREL's technical disciplines focus on development and characterization of renewable energy and energy efficiency technologies. They include:

- Biological sciences
- Chemical sciences
- Computational sciences
- Electrocatalysis
- Energy conversion and storage
- Materials sciences
- Nanoscience
- Optoelectronic technologies
- Solid state spectroscopy
- Solid-state theory

In addition, NREL has established a systems integration capability. This function supports informed DOE decision-making for complex R&D programs by providing comprehensive technical and programmatic baselining activities, independent and objective analysis and recommendations, and the implementation of key management and systems engineering processes.



Dan E. Arvizu

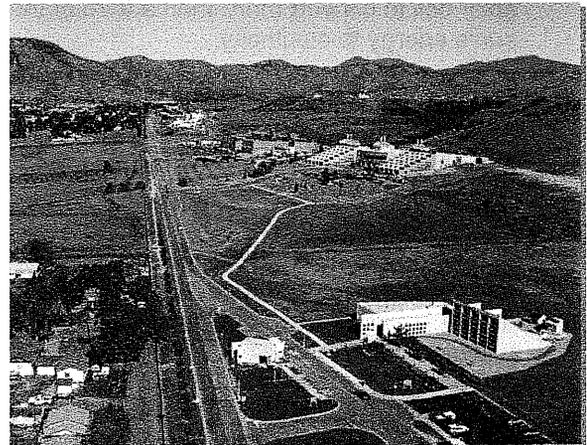
Laboratory Director

Dan E. Arvizu, Ph.D, became NREL's eighth Laboratory Director on January 15, 2005. Prior to NREL, Arvizu was an executive with CH2M HILL Companies. Most recently, he was Senior Vice President and Chief Technology Officer of the Federal and Industrial Client Groups. Before joining CH2M HILL, he was also an executive with Sandia National

Laboratories, where he worked for more than 20 years. He began his career at the AT&T Bell Telephone Labs Customer Switching Laboratory. Arvizu was recently appointed to the National Science Board by President George W. Bush.

Location

NREL's main 327-acre site is in Golden, Colorado, just west of Denver. The Laboratory also operates the National Wind Technology Center on 307 acres about 20 miles north of Golden, adjacent to the Department of Energy's Rocky Flats Environmental Test Site.



Major Programs

NREL's renewable energy and energy efficiency research spans fundamental science to technology solutions. Major program areas are:

- Advanced Vehicle Technologies & Fuels (hybrid vehicles, fuels utilization)
- Basic Energy Science
- Biomass (biorefineries, biosciences)
- Building Technologies (building efficiency, zero energy buildings)
- Electric Infrastructure Systems (distribution & interconnection, thermal systems, superconductivity)
- Energy Analysis
- Geothermal Energy
- Hydrogen & Fuel Cells (production, storage, infrastructure & end use),
- Solar (photovoltaics, concentrating solar power and solar thermal)
- Wind Energy

Applying Technologies

NREL partners with international, environmental and government agencies to apply renewable energy and energy efficiency solutions. The Laboratory works with industry to transform NREL expertise and technology into commercially viable products. The Laboratory also licenses its technologies to promote commercialization of clean, efficient, and sustainable energy options.

Achievements & Awards

- Researchers fabricated a 34%-efficient solar cell (III-V materials, triple junction), the first solar cell to convert more than a third of the sun's energy to electricity.
- Organic molecular semiconductors, potentially useful as low-cost and efficient solar materials, were doped successfully and properly for the first time.
- Group III-V semiconductor quantum dots were successfully produced as colloids and as solid-state arrays, and the charge-carrier relaxation dynamics were established for the first time.

- R&D 100 awards – NREL research has been recognized with 35 R&D 100 Awards, more per researcher than any other DOE national laboratory. Most recently, it collected an award for developing a new High-Rate Vapor Transport Deposition process for depositing semiconductor layers onto photovoltaic (PV) modules, which is expected to lower the cost of solar cells.

Staff

NREL's staff of nearly 1,200 is dedicated to advancing renewable energy and energy efficiency research and development.

Total funding (in millions):

FY00	FY01	FY02	FY03	FY04
186.7	214.5	215.8	229.8	211.9

Major Research Facilities

- Solar Energy Research Facility—home to the National Center for Photovoltaics and hydrogen and basic science research
- Field Test Laboratory Building—home to the National Bioenergy Center; includes the Thermochemical Users Facility
- Thermal Test Facility—houses buildings and efficiency research; includes the Battery Test Facility
- Alternative Fuels User Facility—includes Biotechnology Pilot Scale Unit
- Solar Furnace
- Solar Radiation Research Laboratory
- Photovoltaics Outdoor Test Facility
- National Wind Technology Center — blade structural test facility, megawatt dynamometer test stand, and full-scale turbine testing sites
- Distributed Energy Test Facility
- Science & Technology Facility — this new facility, expected to be completed in 2006, will house solar, basic science and hydrogen research

