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Energy Field Tour 2003 (August 11-16)

2003

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### Day 1. Monday, August 11, 2003: National Renewable Energy Lab

National Energy Renewable Laboratory

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#### Citation Information

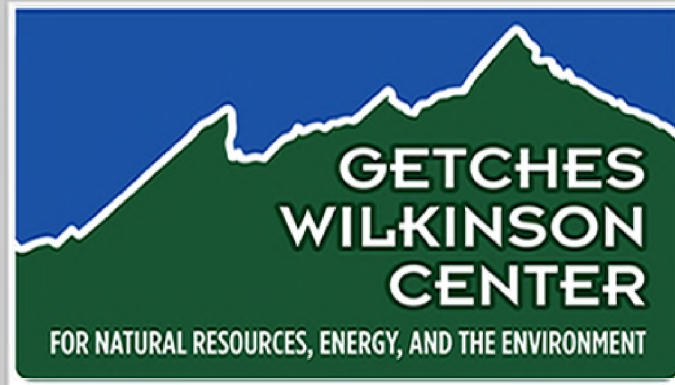
National Energy Renewable Laboratory, "Day 1. Monday, August 11, 2003: National Renewable Energy Lab" (2003). *Energy Field Tour 2003 (August 11-16)*.

<https://scholar.law.colorado.edu/energy-field-tour-2003/13>

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*Day 1. Monday, August 11, 2003: National Renewable Energy Lab, in ENERGY FIELD TOUR 2003 (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 2003).*

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# ***National Renewable Energy Lab***

- NREL at a Glance, NREL web site  
<http://www.nrel.gov/ata glance>
- NREL Technologies, NREL web site  
<http://www.nrel.gov/wind> etc.



## NREL at a Glance

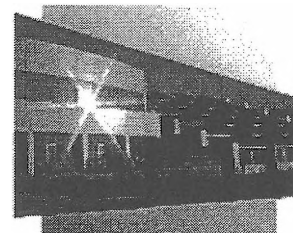
**As a leading center for renewable energy and energy efficiency research, NREL is developing new energy technologies to benefit both the environment and the economy.**

**E**nergy. There's no shortage of renewable energy resources. North Dakota has enough wind to supply 35% of the total U.S. electricity demand. The sunlight falling on the United States in one day contains more than twice the energy we consume in an entire year. Fast-growing plants and other self-renewing resources awaiting the right technologies for harvesting. Continued research will ensure that these technologies are efficient, reliable and affordable.

**E**conomy. In 2000, America imported more than half its oil at a cost of \$109 billion, according to the Energy Information Administration (EIA). New energy technologies based on indigenous, self-renewing resources will help keep these dollars at home to strengthen the economy and create new jobs. A 2001 World Wildlife Fund study estimates that energy efficiency policies and renewable energy resource development could result in 1.3 million new jobs by 2020.

**E**nvironment. The EIA estimates that in 2000, 81% of all U.S. greenhouse gases were carbon dioxide emissions from energy-related sources. Clean energy sources such as sunlight and wind can be harnessed to produce electricity, process heat, fuel and valuable chemicals with little, if any, pollution. Sunlight also can be harnessed for tasks such as cleaning up contaminated soil and groundwater.

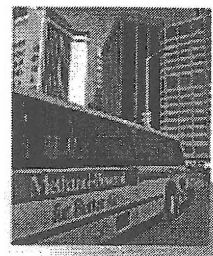
**O**rigins. The National Renewable Energy Laboratory (NREL) was established by the Solar Energy Research Development and Demonstration Act of 1974. Originally called the Solar Energy Research Institute, NREL began operating in July 1977 and was designated a national laboratory of the U.S. Department of Energy (DOE) in September 1991.



A quarter-century of research has yielded remarkable progress in many renewable energy technologies. The cost of wind energy has declined from 40¢ per kilowatt-hour to less than 5¢. The cost of electricity from photovoltaics has dropped from more than \$1/kilowatt-hour in 1980 to

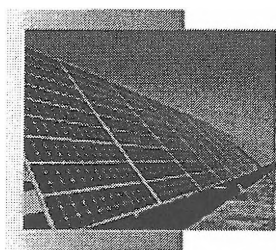
nearly 20¢/kilowatt-hour today. And ethanol costs have plummeted from \$4 per gallon in the early 1980s to \$1.20 today.

With guidance and funding from the DOE, NREL researchers will continue to improve efficiencies and lower costs to competitive levels. NREL also is working with utilities, state regulatory agencies, the World Bank and international trade groups to make sure that renewable energy technologies reach the marketplace as quickly as possible.



**Mission.** NREL's mission is to develop renewable energy and energy efficiency technologies and practices, advance related science and engineering, and transfer knowledge and innovations to address the nation's energy and environmental goals.

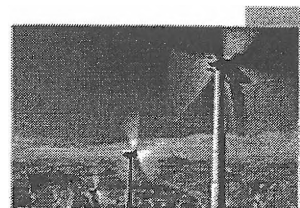
**Management.** NREL is a national laboratory owned by the U.S. Department of Energy and managed by Midwest Research Institute, Battelle Memorial Institute and Bechtel National, Inc.



**Research Programs.** Almost 50 areas of scientific investigation include basic energy research, photovoltaics, wind energy, building technologies, advanced vehicle technologies, solar thermal electric, hydrogen, superconductivity, geothermal power and distributed energy resources.

**Award-winning Science.** Since its inception, NREL's research has won 31 R&D 100 awards—the most per staff member of any DOE laboratory. Many of NREL's research achievements have been ranked among the nation's most significant technical innovations by *R&D*, *Discover*, and *Popular Science* magazine. Learn more.

**Funding.** NREL's operating budget for fiscal year 2001 was about \$216 million. About 94% of NREL's funding comes from the DOE's Office of Energy Efficiency and Renewable Energy, with the remainder from sources such as grants, cost-shared research with industry, and other DOE offices. Learn more.



**Staffing.** NREL employs about 1,100 people, including researchers, engineers, analysts and administrative staff, plus visiting professionals, graduate students, interns and leased workers. The largest number of renewable energy and energy efficiency experts in the world choose to work at NREL.

**U**ser **F**acilities & **C**enters of **E**xcellence. NREL's 300-acre campus is at the foot of South Table Mountain in Golden, Colo. Major research facilities include:

Solar Energy Research Facility—photovoltaics, superconductivity and materials science, housing the National Center for Photovoltaics

Field Test Laboratory Building—alternative fuels, biomass-derived chemicals and genetic engineering

Thermal Test Facility—buildings research and energy efficiency including the Battery Thermal Test Facility.

Photovoltaic Outdoor Test Facility

Alternative Fuels User Facility and Process Development Unit

Solar Furnace and Solar Radiation Research Laboratory

National Wind Technology Center (north of Golden)

Thermochemical Users Facility

NREL's administrative offices occupy leased space in Denver West Office Park.

**I**ndustry **P**artnerships: In any given year approximately half of NREL's funding returns directly to the private sector through subcontracts, cost-shared research agreements and procurements. Research partners include more than 70 universities, 250 companies, 25 state energy offices and 80 not-for-profit organizations. NREL's progressive business practices have been honored by the Small Business Administration, Minority Enterprises, Inc. and the Federal Laboratory Consortium. Learn more.

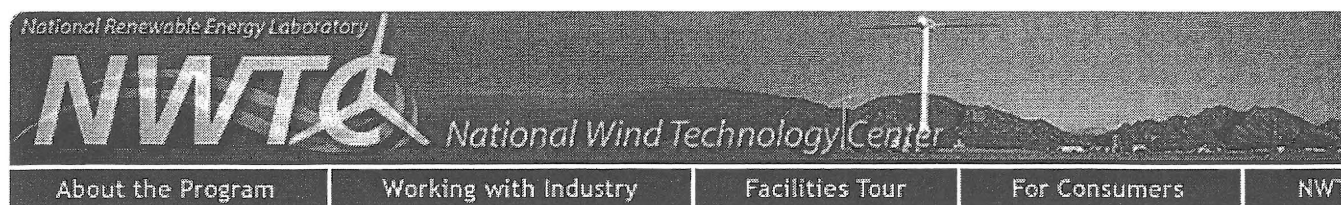
## Additional Online Resources

NREL Overview—more in-depth information about NREL's expertise and operations

NREL Organization & People—key contacts, online phonebook, and organization chart

NREL Institutional Plan 2001-2005—where the Lab is now and where it's going, with information on technical and administrative activities (PDF 3.04 MB) Download Acrobat Reader

NREL/BR-810-30491  
Last updated: 13 February 2002



### Current Events

#### **NARUC Summer Committee Meeting**

Denver, Colorado  
July 27 - 30

[Events Calendar](#)



### Special Features

[Wind Turbine Smoke Test](#)

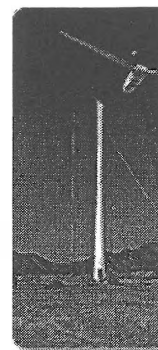
[How Do Wind Turbines Work?](#)

[Where Does the Wind Blow?](#)

### Getting to the NWTC

## National Wind Technology Center

The National Wind Technology Center, located at the foot of the Rocky Mountains near Boulder, Colorado, is a world-class research facility managed by the National Renewable Energy Laboratory for the U.S. Department of Energy. NWTC researchers work with members of the wind energy industry to advance wind power technologies that lower the cost of wind energy through research and development of state-of-the-art wind turbine designs.



**Wind Power Today: Wind Energy Program Highlights 2002**

**Office of Energy Efficiency and Renewable Energy (EERE) Brochure** ([PDF 2.5 MB](#))

**Opportunity for Cooperative Research and Development Agreements (CRADAs) for:**

Large Wind Turbine Blade Testing ([MS Word 1.9 MB](#))

**Presolicitation Notices**

[Low Wind Speed Technology Development Phase II](#)

[Low Wind Speed Technology for Small Wind Turbines](#)

[Certification Process & Guidelines](#)

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[NREL Home](#) | [U.S. Department of Energy](#) | [DOE Wind Home](#) | [Security and Privacy](#) | [Webmaster](#)



# Bioenergy



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## Biotechnology

NREL's Biotechnology Division for Fuels and Chemicals, the principal organization carrying out the U.S. DOE's National Biofuels Program, performs R&D for biological production of fuel ethanol and other chemicals from biomass—nonfood plant materials or plant-derived wastes.

## Chemistry for Bioenergy Systems

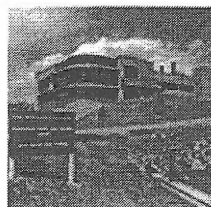
The Chemistry for BioEnergy Systems Division undertakes and supports research in chemical sciences, engineering, and integrated systems relating to renewable energy technologies.

## Related Links

Also see these related DOE and interagency program Web sites.

- [Biobased Products and Bioenergy](#)
- [Biofuels](#)
- [Biopower](#)
- [OIT Agriculture and Forest Products Industries of the Future](#)

### FEATURE



The U.S. Department of Energy's [Biofuels Program](#) has resources for researchers involved in biofuels technology research.





# Hydrogen



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## ► Hydrogen Technologies & Systems

NREL's Hydrogen Technologies & Systems group works toward the integration of hydrogen systems to deliver multiple products and services from renewable resources by developing advanced technologies and systems. The group's current areas of emphasis include:

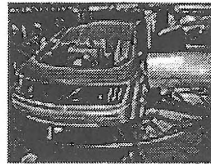
- [Systems Integration](#)
- [Safety, Codes and Standards](#)
- [Partnerships and Collaborations](#)
- [Research in Hydrogen Production and Utilization](#)

## Related Links

See these related DOE program Web sites.

- [Hydrogen, Fuel Cells & Infrastructure Technologies](#)
- [FreedomCAR & Vehicle Technologies](#)

## FEATURE



President Announces \$1.2 Billion [Hydrogen Fuel Initiative](#).



# Electricity Technologies



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## Resources for Utilities

### Database of Grid-Connected Renewables

Database information on 113,000 MW of renewable energy generation capacity connected to the utility grid.

### Electric Markets Analysis & Applications

NREL's utility analysts provide strategic information to facilitate renewable energy technologies in electric markets.

### Green Power Network

The Green Power Network gives up-to-date news about green power marketing and utility green pricing programs.

### State Renewable Energy News

NARUC's Subcommittee on Renewable Energy provides information on state-level renewable energy activities.

## Renewable Energy Technologies

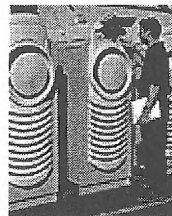
Get a quick overview of renewable electricity technologies or find in-depth information in the following Web sites:

- [Biopower](#)
- [Geothermal Electricity](#)
- [Ocean Thermal Energy Conversion](#)
- [Photovoltaics](#)
- [Concentrating Solar Power](#)
- [Wind Power](#)

### RELATED TECHNOLOGIES

- [Hydrogen](#)
- [Superconductivity for Electric Systems](#)

### FEATURE



U.S. Department of Energy's **Distribution & Interconnection R&D Program** Web site provides information and current news about distributed power and more.