

Sustainable Energy

*Clean, Safe Energy That's
Renewable and Efficient*

in Arizona

Did you know ... that the price of photovoltaic electricity has dropped dramatically from \$15 per kilowatt-hour in 1975 to less than 25¢ per kilowatt-hour today; the cost of wind energy has dropped over 50%?

And... that Arizona receives more energy in the form of sunlight, called insolation, than any other state, with 314 days of sunshine every year?

Jobs in Sustainable Energy

The U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) leads the nation in research and development and lab-scale demonstration of sustainable energy technologies. In FY 1997, a total of \$400,357 in research contracts, service subcontracts, and procurements was awarded to Arizona organizations by NREL.

NREL's many programs help facilitate technology development with interested consumers and potential partners from industry, business, academia, and the global community. NREL's technologies, which are clean and green, include:

- Photovoltaics
- Wind
- Biofuels
- Biomass power
- Hydrogen
- Superconductivity
- Solar thermal
- Geothermal
- Hybrid vehicles
- Building energy systems
- Industrial applications of solar power.

DOE's Federal Energy Management Program (FEMP) activities could add 153 jobs each year and save people in Arizona \$8 million in annual energy costs.

Clean Energy = Clean Environment

The clean electricity generated from renewable energy sources in Arizona from both utility and nonutility generators displaces about 2,223 tons of carbon dioxide per year (measured in carbon units) that would be emitted by coal-fired power plants.

Between March 1996 and March 1997, the U.S. Environmental Protection Agency's Green Lights and Energy Star programs helped save 175 million kilowatt-hours of energy in Arizona. This saved consumers in the state at least \$14 million in energy bills and prevented more than 87,500 tons of carbon dioxide from entering the atmosphere. Projected cost savings through the year 2000 resulting from energy investments already made is \$44 million.

Economic Benefits

In FY 1996, DOE's Office of Energy Efficiency and Renewable Energy (EE) invested \$1.7 million in Arizona. Arizona's consumer energy cost savings from EE research and development products are estimated to be more than \$465 million.¹

- One hundred businesses in Arizona specialize in renewable energy-related products and services.
- State weatherization programs, aided by federal funding from DOE, helped at least 370 low-income and other disadvantaged Arizona families last year.
- EE selected Electric Transportation Applications of Phoenix, along with its partners Arizona Public Service and the Salt River Project, to test and evaluate electric vehicles. The three-year, \$4.5 million cooperative agreement operates on a 50-50, cost-shared basis.
- With the assistance of EE's Regional Biomass Energy Program, Arizona State University and Rentech, Inc., are developing a system for converting rice hulls to fuel. The new process will convert the hulls to feedstock for the production of diesel fuel. The final product is a liquid

Did you know... that Arizona's electric utilities generate 52.4% of the state's electricity from coal, 3.3% from natural gas, 33.4% from nuclear, 10.7% from hydro-electric, and 0.2% from petroleum and other sources?

And... that although Arizona ranks among the top five states for photovoltaic energy generation and for solar hot-water heating, together they account for less than 1.5 percent of the state's renewable energy consumption?

fuel suitable for combustion in a variety of diesel engines; it produces significantly fewer air pollution emissions than those produced by diesel fuel derived from petroleum.

- The Tucson Electric Power Company has voluntarily joined with DOE in participating in the Climate Challenge Program—a diverse portfolio of greenhouse gas reduction projects that also satisfy the electricity needs of customers and help clean the environment. Tucson Electric is taking part in international carbon-reducing power projects in Honduras and the Czech Republic, as well as domestic initiatives such as photovoltaics, landfill methane reductions, forestry, and reducing a highly reactive greenhouse gas, called sulfur hexafluoride (SF₆), used in utility equipment. Tucson Electric is also committing to a total of 423,000 tons of CO₂ reductions in the year 2000.
- After starting an energy program in the late 1970s with zero project funds in its first year, Phoenix has developed one of the most effective energy management programs in the country. Phoenix uses budget incentives to encourage department heads and employees to save money by conserving energy. Within a decade of its inception, energy savings from this program were exceeding \$1 million per year.
- For some 64 Native American families living on Navajo reservation land in the Southwest U.S., solar systems are bringing electricity for the first time to homes in areas that have traditionally gone without utility service.

Want More Information?

**Office of Energy Conservation
Consumer Hotline**
800-OEC-6662

**Energy Efficiency and Renewable
Energy Clearinghouse (EREC)**
800-363-3732
<http://www.eren.doe.gov>

**National Renewable Energy
Laboratory (NREL)**
800-644-NREL
<http://www.nrel.gov>

**Federal Energy Management
Program (FEMP)**
<http://www.eren.doe.gov/femp/>

**National Association of State
Energy Officials**
<http://www.naseo.org/>

**U.S. Environmental Protection Agency's
(EPA) Green Lights and Energy Star**
<http://www.epa.gov/energystar.html>

¹Based on a GAO review and validation of the energy savings of EE research and development success stories.

Questions?

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National Renewable Energy Laboratory

NREL is a national laboratory of the U.S. Department of Energy (DOE), managed for DOE by Midwest Research Institute