



Renewable Energy Center (REC)

The **DRI Renewable Energy Center (REC)** is an organizational umbrella under which all the Institute's renewable energy (RE) activities are conducted. The current research focus of the DRI-REC is on wind energy, hydrogen applications, and biomass/biofuels. Public outreach and education programs in RE are also included under the REC umbrella. Most DRI faculty and staff associated with the DRI-REC are located at DRI's Dandini campus in Reno, Nevada.



Renewable Fuels

History

The DRI-REC concept began within the Nevada Southwest Energy Partnership (NSWEP) Program. NSWEP is a collaboration among the Nevada State Office of Energy (NSOE), the U.S. Department of Energy (DOE), the National Renewable Energy Laboratory (NREL), UNLV, UNR, and DRI. NSWEP funding is provided by DOE, and is managed by NREL. (<http://www.nswep.org/>)

Mission and Goals

The mission of the DRI-REC is to promote and coordinate renewable energy research, development, demonstration, and deployment (RDD&D) activities

undertaken by DRI faculty members and their partners in industry, academia, and governmental organizations. DRI strives to be a credible, independent authority regarding the benefits and limitations of renewable energy systems and their impacts upon the environment.

Strategies

The DRI-REC achieves its mission and goals by building upon existing core competencies and by partnering with other organizations to expand its range of competencies. By coupling DRI's strengths in environmental science and laboratory analyses with partners' strengths in engineering and economics, the impact of the DRI-REC is broadened.



Biomax 15 Gasification Unit

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The Desert Research Institute (DRI) is the nonprofit research campus of the Nevada System of Higher Education (NSHE). DRI is a unique blending of academia and entrepreneurship. From our desert home in Nevada, DRI employs more than 500 faculty, support staff, and students who are engaged in a research enterprise generating approximately \$45 million in total annual revenue. At any given time, DRI is engaged in about 300 scientific research projects from our main research campuses in Las Vegas and Reno, with subsidiary campuses in Boulder City, NV and Steamboat Springs, CO. DRI's environmental research programs are directed from three core divisions (Atmospheric Sciences, Earth and Ecosystem Sciences, and Hydrologic Sciences). Research faculty from all three Divisions participate in the DRI-REC. Grounded in fundamental research, we provide our sponsors and clients with innovative solutions to pressing environmental problems as we balance the need to develop resources while protecting and sustaining the environment.

DRI-REC Facilities and Capabilities

Assessment of Renewable Energy Resources

- Resource mapping for wind, solar, geothermal, and biomass
- Wind power modeling
- Meteorological/climatological assessments

Health, Environment, and Ecosystem Issues

- Impacts of energy production, distribution and use
- Climate change impacts
- Life-Cycle impacts on air, water, and ecosystems
- Safety and health risk assessments
- Regulatory activities and policies
- Technical support for legal activities

Alternative and Renewable Fuels

- Biofuels
- Evaluation of production technologies
- Characterization of feedstocks, intermediates, and products
- Emissions and air quality impacts
- Fuel standards and specifications

Transportation Applications

- Vehicle and fuel technologies
- Emissions control systems
- Re-fueling infrastructure requirements
- Remote sensing of vehicle emissions
- Effects of alternative fuels on vehicle performance and emissions



PV Arrays at Dandini Campus

Assessment of Renewable Energy Systems

- CO₂ capture/sequestration
- Hydrogen production and storage
- Biomass-to-energy conversion technologies
- Integrated fuel cell/hydrogen systems
- Small scale wind and solar systems
- Mineral recovery from geothermal sources

Integrated Energy Systems

- Data acquisition, display, and archiving
- Optimized control and management strategies
- Off-grid renewable power systems
- Information technology
- Monitoring of residential utility usage

Water/Energy Nexus

- Water resource assessment
- Water requirements for energy production
- Impacts of biofuels on water supply/water quality
- Water quality and remediation
- Increased water supply via weather modification

Education and Outreach

- Green Power Program
- Workforce training
- Energy policy review
- Teaching university courses
- Graduate student training



Hydrogen Off-grid System