Clean Technologies and Renewable Energy Center

Approach
- Build on DRI’s success in basic and applied research in renewable energy and the development and application of new technologies to address environmental issues.
- Provide an organizational umbrella under which all of DRI’s renewable energy research, education, and outreach are conducted.
- Facilitate interdisciplinary research across DRI’s three divisions and through collaborations with other organizations.
- Foster the development of interdisciplinary and interinstitutional research teams that explore emerging areas in renewable energy and the development and application of clean technologies.
- Serve as a neutral forum to assess renewable energy and clean technology initiatives.

Background
The Clean Technologies and Renewable Energy Center, one of four interdisciplinary science centers at DRI, was created in 2010 as part of our efforts to extend our fundamental research in atmospheric, hydrologic, and earth and ecosystem sciences to address the benefits and limitations of renewable energy systems and their impacts upon the environment.

The current focus of DRI’s renewable energy research is on wind, solar, and geothermal energy, hydrogen applications, and biomass-to-energy systems.

Mission
To promote and coordinate renewable energy research, development, demonstration, and deployment activities by DRI and its partners.

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Highlighted Projects

NEVADA RENEWABLE ENERGY CONSORTIUM The Nevada Renewable Energy Consortium (NVREC) is an association among the three Nevada System of Higher Education (NSHE) research institutions (Desert Research Institute, the Universities of Nevada, Reno and Las Vegas), along with participating Nevada community colleges.

The ultimate purpose of the Consortium is to help Nevada achieve its vision of being a national leader in renewable energy research, development, and workforce development. Current focal areas include: biomass, solar, geothermal, wind, hydrogen and renewable technologies.

NEVADA SOUTHWEST ENERGY PARTNERSHIP The DRI CTREC concept began within the Nevada Southwest Energy Partnership (NSWEP). NSWEP is collaboration among the Nevada State Office of Energy, the U.S. Department of Energy, the National Renewable Energy Laboratory, UNLV, UNR, and DRI. NSWEP funding is provided by DOE, and is managed by the National Renewable Energy Laboratory. The ultimate purpose of NSWEP is the advancement of research, development, and project deployment for solar, geothermal, wind and hydrogen renewable technologies in the American Southwest.

Capabilities

ASSESSMENT OF RENEWABLE ENERGY RESOURCES
- Resource mapping for wind, solar, geothermal, 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

TRANSPORTATION APPLICATIONS
- Vehicle and fuel technologies
- Emissions control systems
- Re-fueling infrastructure requirements
- Remote sensing of vehicle emissions

ASSESSMENT OF RENEWABLE ENERGY SYSTEMS
- CO₂ capture/sequestration
- Hydrogen 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, transmission, 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
- Water quality and remediation
- Increased water supply via weather modification

As part of NVREC; UNR, DRI and UNLV Scientists are engineering and testing several strains of algae for optimum starches and lipids and salinity tolerance for use in producing biofuels.

PHOTO BY MIKE WOLTERBECK, UNIVERSITY OF NEVADA, RENO.

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

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