



Science and Technology Development for Renewable Energy Applications

Cooperative Research and Development Final Report

CRADA Number: CRD-03-00122

NREL Technical Contact: Walter Musial

CRADA Report
NREL/TP-7A1-48402
July 2010

NREL is operated for DOE by the Alliance for Sustainable Energy, LLC

Contract No. DE-AC36-08-GO28308



NOTICE

This report was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

Available electronically at <http://www.osti.gov/bridge>

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from:

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
phone: 865.576.8401
fax: 865.576.5728
email: <mailto:reports@adonis.osti.gov>

Available for sale to the public, in paper, from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
phone: 800.553.6847
fax: 703.605.6900
email: orders@ntis.fedworld.gov
online ordering: <http://www.ntis.gov/ordering.htm>



Cooperative Research and Development Final Report

In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: CRD-03-00122

CRADA Title: Science and Technology Development for Renewable Energy Applications

Parties to the Agreement: General Electric + NREL + Sandia National Labs

Abstract of CRADA work:

This CRADA PTS is a vital element of a larger GE effort to design and build higher-power next-generation wind turbine generators with a cost of energy production competitive or less than conventional fuel based generation. This is essential to the successful deployment of wind turbines closer to populated load centers consistent with the DOE's goals. The technology jointly developed will enable the design and manufacture of lighter-weight, more cost-effective wind turbine generators. GE believes that the successful implementation of this technology will contribute significantly to maintaining GE's competitiveness in the global wind turbine market and, to this end, has dedicated a number of its own researchers and funds, to develop this technology.

Summary of Research Results:

Category 1: Wind Energy

This category covers any work associated with the design, development, manufacturing, fielding, maintenance, or operation of wind energy systems. The work also involved development of design tools, design procedures, or international standards. Projects in this category included field and laboratory testing of existing designs; development of advanced components such as blades, control systems, or drive trains; or addressing novel uses, such as offshore applications. Projects also addressed the monitoring and operations of full-scale wind farms.

Category 2: Solar Energy

This category encompasses any work associated with the design, development, manufacturing, fielding, maintenance, or operation of solar energy systems. The work also involved development of design tools, design procedures, or international standards. Projects in this category included field and laboratory testing of existing designs; development of advanced components such as PV cells/modules, control systems, and power conversion systems; or addressing novel applications. Projects also addressed the monitoring and operations of solar energy installations.

Category 3: Hybrid Renewable Energy Systems

This category includes any work associated with the design, development, manufacturing, fielding, maintenance, or operation of hybrid renewable energy systems. The work also involved development of design tools, design procedures, or international standards. This category addressed combinations of conventional and renewable energy sources, such as solar, wind, hydro, and geothermal sources coupled with energy storage to lessen dependence on hydrocarbon energy sources like diesel fuel. This category also covered grid-independent village power and island power systems. Projects in this

category included field and laboratory testing of existing designs; development of advanced components such as hydrogen electrolyzers, control/power conversion systems, and desalination systems; or addressing novel applications. Projects addressed the monitoring and operations of renewable energy system installations.

Category 4: Geo-Thermal Energy Systems

This category encompasses any work associated with the design, development, manufacturing, fielding, maintenance, or operation of geothermal energy systems. The work also involved development of design tools, design procedures, or international standards. Projects in this category included field and laboratory testing of existing designs, development of advanced components such as turbine-generators and heat exchangers, improvement of construction techniques, or addressing novel applications. Projects also addressed the monitoring and operations of geothermal energy installations.

Subject Inventions listing: None

Report Date: 2.26.10

Responsible Technical Contact at Alliance/NREL: Musial, Walter

This document contains NO confidential, protectable, or proprietary information.