U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Develop NREL Center for Low Temperature Research/Project Data Collection

May 19, 2010

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NREL

Low Temperature Demonstration Projects

Overview

- DOE requested NREL to take a leadership role in development of an RD&D program for low-temperature geothermal resources
  - New AOP-funded activity in FY10
    - Funding and authorization in process
    - Anticipated start date May 2010
  - Funding
    - FY09 - $0
    - FY10 - $1400K
  - Barriers include low conversion efficiency, high development costs, poorly understood markets, lack of data to support project evaluation and development
  - Partnerships tbd, will include universities, industry, communities, State Energy Offices

Relevance/Impact of Research

This project will accelerate the commercial application of low temperature Geothermal resources in the United States

- Engage private sector firms, customers, and stakeholders in identifying and assessing near-term applications
  - Co-production from oil and gas
  - Geo-pressured
  - Electricity
  - Thermal energy
- Comprehensive data collection and analysis from past and present projects to better understand issue and capture lessons learned
- Identify, evaluate, and implement RD&D activities that address barriers and facilitate rapid market development

Task 1: Data Collection

- Identify specific data requirements most important to the evaluation of LTGT applications by policy makers, industry, and customers
- Conduct evaluations of existing projects, including levelized cost of energy and financial viability
- Build collaborations that can leverage DOE investments with stakeholders such as the California Energy Commission.
- Actively engage with ARRA projects to support development of institutional knowledge and development of lessons learned
- Conduct outreach activities to industry and customers to identify and evaluate potential projects
- Identify and implement opportunities for improving tools and databases

Scientific/Technical Approach

Task 2: Develop NREL Center for Low-Temperature Geothermal Research

- An internationally recognized research centered focused on research with quick market impacts
- Internal Team/Hiring
  - Attract top talent in a very limited and specialized pool to provide leadership
  - Mix of academic researches and staff with field experience
- Ongoing relationships with a few key universities
  - Joint appointments
  - Student projects and post-doc positions
  - Support geothermal educational

Accomplishments

- Vetted concepts with stakeholders at state energy offices, industry, other research organizations, and universities
- Established joint appointment for Masami Nakagawa of Colorado School of Mines

Planned Accomplishments

- Assess existing data sources (proprietary and public) for coproduction resources
- Validate concept and structure for data collection and use of a portal
- Hire 3 FTE staff to provide leadership
- Establish 2 additional collaborations

Project Management/Coordination

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- FY10 Project Management
  - Monthly reports to DOE HQ management
  - Schedule
    - Validate information portal and coordination plan with NGDS – July 10
    - Assess existing data – Aug 10
    - Recruit leadership team - Sept 10
    - Two additional collaborations – Sept 10
  - Spending plan under revision
- National Geothermal Data System
  - Use and supply data in a value added manner
  - Frequent meetings during NGDA development, including NREL technical consulting as requested

Future Directions

- Technical meetings with ARRA teams to identify common needs and issues
- Interaction with communities considering low-temperature geothermal energy solutions.
  - Existing projects: capture lessons learned
  - Potential projects: identify needs for technical assistance ad capture information related to barriers.
- Detailed understanding of cost, performance, integration issues, and deployment barriers
- Deploy digital solutions on data portal that provides both ease of use and development of community tools
- Identify key R&D directions and expected benefits

Mandatory Summary Slide

- This is a new program thrust that is just being launched.
- Low-temperature geothermal resources are a relatively untapped market in the U.S., with the potential to add energy to economy in near to mid-term
- Efforts will include a mixture of
  - Data capture, analysis, lessons learned, and tools for developers
  - Characterizing market barriers
  - R&D aimed at highest impact barriers
  - Laboratory activities with a high degree of collaboration