

Executive Summary

Geothermal resources are available across the United States at varying depths, providing a ubiquitous buried treasure of domestic renewable energy. Approximately 3 GWe of hydrothermal geothermal energy is available in the western United States, but theoretically, geothermal sources are available across the United States. The key to being able to use geothermal energy is to find a way to enhance geothermal systems lacking key natural characteristics. Natural geothermal systems depend on three factors to produce energy: heat, water, and permeability. While heat is present virtually everywhere at depth, water and permeability are less abundant.

Geothermal technology is an attractive renewable resource because it can provide a constant source of renewable baseload electricity. While the sun and wind offer a large potential source of renewable energy that varies over time, geothermal technology is uninterrupted and can provide a stable baseload form of energy while diversifying the nation's renewable portfolio.

Geothermal energy has low environmental risk and impact. When used with a closed-loop binary power plant, geothermal systems emit zero greenhouse gas emissions and have a near zero environmental risk or impact.

Geothermal energy is ubiquitous, constant, clean, domestic, and renewable.

Geothermal energy also has the potential to make a significant contribution to energy independence. The resource size and domestic distribution, coupled with technology advancements in Enhanced Geothermal Systems (EGS) will help reduce national dependence on hydrocarbons for electricity generation and free these critical resources for other uses. As such, geothermal energy will supplement the domestic renewable energy portfolio.

The most critical near-term Program activity is demonstration of Enhanced Geothermal Systems. The key decision point for EGS demonstrations is whether these systems can be shown to be technically feasible by 2015. During 2006 EGS workshops, geothermal industry representatives agreed that initial EGS demonstrations should occur where data already exists indicating a favorable target for potential EGS development and electricity production. Accessibility to the grid, cooperative industry partner(s) with available land, and a favorable environmental setting are all critical for site selection.

Three steps will be important in pursuing EGS demonstrations goals:

- Validating the applicability of existing technologies.
- Establishing a broad knowledge base covering existing technologies.
- Thoroughly documenting the lessons learned to minimize duplicative efforts.

This Multi-Year Research, Development, and Demonstration (MYRD&D) Program Plan is only the first step in a new program strategy. Lessons learned will inform Program decision-making and research and development planning to insure that system demonstrations are of the greatest possible value to industry stakeholders engaged in EGS commercialization. As more analyses are performed and the Systems Demonstrations projects progress, project data will inform future research and development activities.

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