DOCKETED

Docket Number:	17-GRDA-01
Project Title:	Geothermal Grant and Loan Program Workshop and Discussion
TN #:	217028
Document Title:	Katherine R Young Comments GeoRePORT Fact Sheet
Description:	N/A
Filer:	System
Organization:	Katherine R Young
Submitter Role:	Public
Submission Date:	4/13/2017 11:42:22 PM
Docketed Date:	4/14/2017

Comment Received From: Katherine R Young
Submitted On: 4/13/2017
Docket Number: 17-GRDA-01

GeoRePORT Fact Sheet

GeoRePORT was developed for the Department of Energy's Geothermal Technologies Office, but CEC may find the protocol helpful, as well. More information is available at: http://en.openei.org/wiki/GeoRePORT

Additional submitted attachment is included below.

Accelerating the Deployment of Geothermal Energy

A Novel Approach to Resource Reporting and Project Assessment

Apart from temperature and depth, how do we as an industry, grade geothermal resources?

How do investors/developers measure and balance risk/return profiles throughout the life of a project?

How does the GTO set measureable program goals that support demonstration and commercialization of emerging technologies and advance the deployment of geothermal energy?

How does GTO measure the impact of its funding?

How do we determine which barrier, if overcome, will have the largest impact on geothermal deployment?

How are these goals, impacts, and advancements communicated to non-technical audiences (e.g. Congress, policymakers, and the public)?

Desert Peak Geothermal energy plant near Fallon, NV, site of a GTP EGS demonstration project. *Photo from Ormat Technologies, Inc.*

Introducing GeoRePORT

The Geothermal Research Portfolio Optimization & Reporting Technique (GeoRePORT) is being developed by the National Renewable Energy Laboratory and Lawrence Berkeley National Lab to assist GTO's efforts in developing, measuring, and reporting impactful near- and long-term investment strategies facilitated by a novel approach to an industry-wide resource reporting system.

GeoRePORT can assist GTO in portfolio optimization and reporting in a number of ways:

- Identify project barriers that significantly affect risk/return profiles
- Report on funded project impact at various levels of activity and certainty
- Evaluate how new proposed projects and technology R&D will help advance current national energy goals
- Gain insights from successes and failures and usefully apply lessons learned to future projects
- Visually represent project and portfolio data to clearly report on funding success and impact to technical and non-technical audiences.

A Comprehensive Approach

Geothermal resource potential is not measurable by temperature alone. Other factors–such as volume, reservoir management, and permitting–play an important part in geothermal project success. GeoRePORT takes a comprehensive approach to reporting geothermal development potential in technical, geological, and socio-economical areas for:

•*Resource grade*: the inherent properties of the resource
•*Project readiness*: the project-readiness of a geothermal site.

To accomplish this, the GeoRePORT team has developed a consistent and objective system for geothermal resource reporting. It is not meant to be new national or local regulatory reporting requirements; it is designed to be used by experts on GTO-funded project teams to provide GTO with a comprehensible means of evaluating the impact of its funding programs. Specifically, to assess the effectiveness of GTO's research, development, and deployment funding portfolio, prioritize future funding requests, and demonstrate the value of its investments to the U.S. Congress and the public.

GeoRePORT can help GTO:

•Quantitatively **identify** the greatest barriers to geothermal development

•**Develop** measureable program goal that will have the greatest impact to geothermal deployment

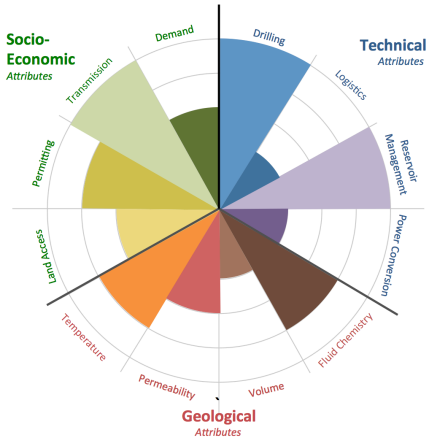
•Objectively **evaluate** proposal base (in part) on a project's ability to contribute to program and national energy goals

•**Monitor** project progress

•**Report** on portfolio performance.

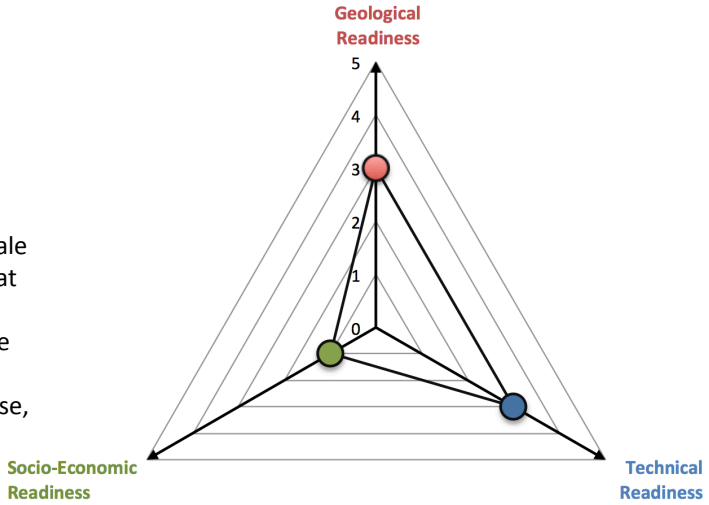
Resource Grades

The grade of a resource can be described as a combination of intrinsic features of the resource that contribute to economic viability. GeoRePORT allows developers to assign grades each of twelve attributes, providing a clear picture of the development potential and challenges at each location. Geological attributes include temperature, volume, permeability, and fluid availability. Technical attributes include drilling, chemistry, reservoir management, and power conversion, and socio-economic attributes include land access, permitting, transmission, and demand.



Project Readiness

Like resource grade, project readiness is broken into geological, technical, and socio-economic assessments. Project readiness levels in each area are valued on a scale of one through five, with five representing the most advanced level of development. Similar to technology readiness levels, project readiness estimates the project maturity or readiness of a geothermal site. The geological readiness scale communicates the historical exploration activities that have occurred at the project location. The technical readiness scale tracks technical progress on the current project. For example, does the tested well have sufficient flow to meet the current project goals. Socio-economic readiness tracks specific milestones and marks completion at each phase, for example, permitting of a well or a reservoir, performing an environmental analysis, or executing a power purchase agreement.



Moving Undiscovered Resources to Identified

A major GTO goal is to "accelerate development of 30 GWe of undiscovered hydrothermal resources." To fully realize this goal, it is important to be able to develop and measure baseline values, as well as incremental improvements, both at the individual project and aggregated portfolio levels. Data developed using GeoRePORT can determine characteristics of undiscovered resources as they correspond to those observed among identified geothermal systems to better understand geothermal resource potential and help target projects that satisfy specific programmatic needs

Identifying Critical Barriers

A January 2016 NREL technical report suggests that overcoming geothermal barriers may allow nearly 698 MWe of postponed projects to resume development to come online. Note that these capacities represent only those projects for which public information was available at the time. Additional projects may also be helped to come online by 2020 if barriers were mitigated. Using the GeoRePORT system to evaluate barriers can help identify which are the most critical project barriers and inform GTO on where research dollars are best spent.

Selecting Ideal Geothermal Locations

Site selection for geothermal projects including exploration, drilling, or potential development of power generating facilities include careful evaluation of many different factors. Currently GTO is in the process of down-selecting site locations for two different GTO funded projects (FORGE and Fairway Play Analysis) that will result in millions of dollars of funding awards. The data GeoRePORT provides could assist GTO in these types of decisions and future locations for research, development, and deployment in a measureable and objective manner.

DOE's Geothermal Technologies Office

GTO works in partnership with industry, academia, and DOE's national laboratories to establish geothermal energy as an economically competitive contributor to the U.S. energy portfolio. GeoRePORT is a novel approach to geothermal resource reporting and is intended to improve baseline assessment, goal setting, application evaluations, project close-out summaries, and portfolio reporting toward the common goal of accelerating the deployment of geothermal energy.

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

For more information, visit: eere.energy.gov
geothermal.energy.gov

DOE/GO-XXXX-XXXX • April 2017

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