



*Enel Stillwater - Courtesy of Enel Green Power – North America*

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**GEA Technology Showcase**  
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The President's Council of Advisors on Science and Technology recommended that DOE conduct a Quadrennial Technology Review to get stakeholder input on DOE priorities and planning.

## Some Questions for the Public

- What should be the criteria for including a technology in the DOE portfolio?
- What are principles and best practices in performing large-scale demonstration projects?
- What, if any, role should the DOE have in addressing non-technical barriers?

## How to get involved:

- Go to [energy.gov/qtr](http://energy.gov/qtr) for more information
- Submit feedback to: [DOE-QTRmailbox@hq.doe.gov](mailto:DOE-QTRmailbox@hq.doe.gov)

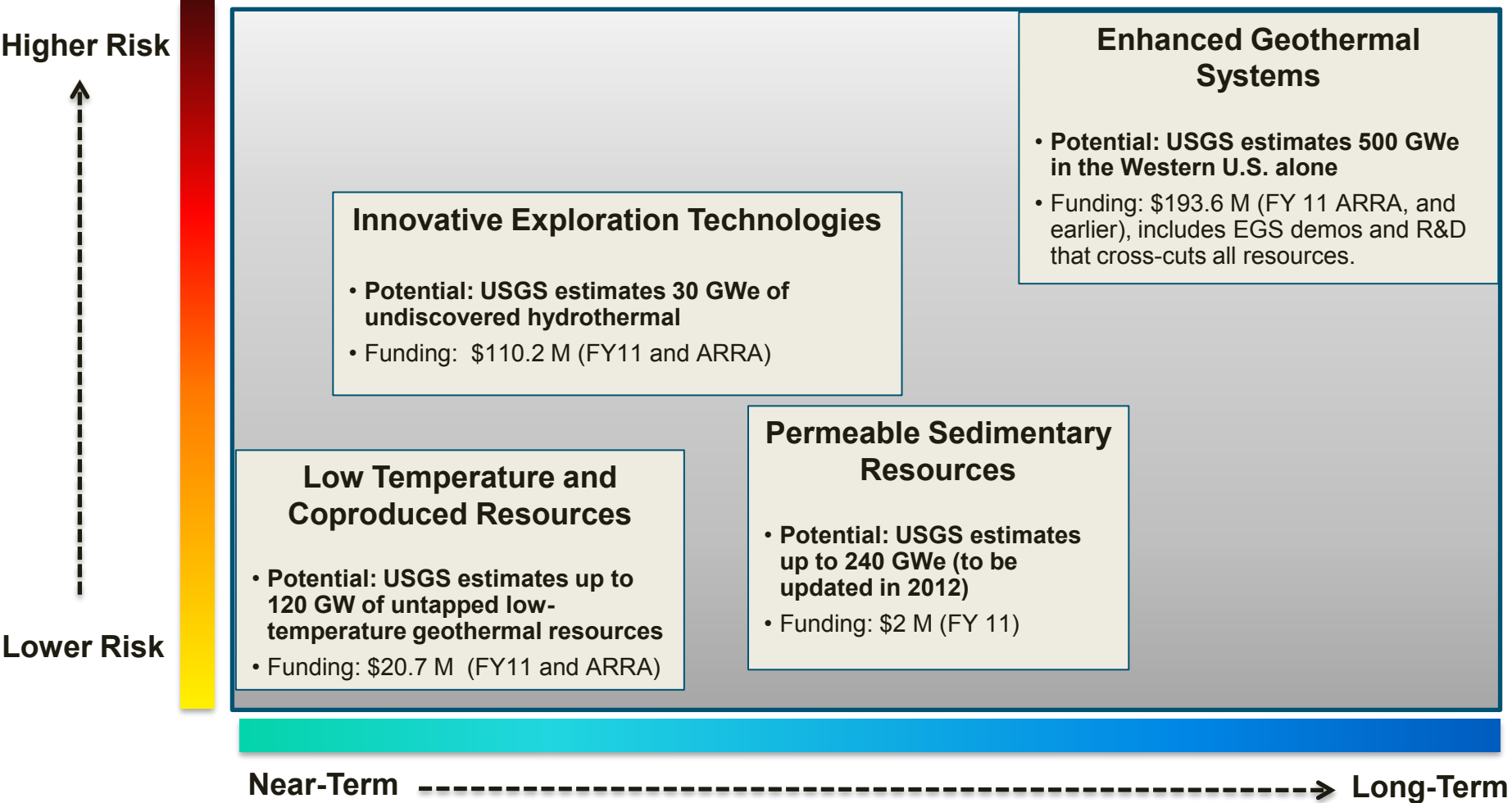
## Current Language on Geothermal in QTR Framing Document

“DOE expects that each of clean electricity supply technologies described above [solar, wind, nuclear, CCS] could contribute significantly to meeting the Nation’s energy goals, and DOE RD&D support has the potential to materially improve these technologies. Other clean electricity supply technologies could also contribute to varying degrees; these include hydroelectric, marine, and **geothermal power technologies** ... **Geothermal and marine power technologies face uncertainties that exceed those of the previously discussed clean power technologies, including uncertainty in the materiality of their impact.**”

Page 40 of the Quadrennial Technology Review Framing Document

[http://www.energy.gov/qtr/documents/DOE-QTR\\_Framing.pdf](http://www.energy.gov/qtr/documents/DOE-QTR_Framing.pdf)

The Program currently supports a diverse portfolio that spans near- to long-term resources and low to high risk technology development. The Recovery Act played a big role in this strategy.



## Approach

### Advance Technology through RD&D

Develop exploration tools for resource confirmation in undiscovered geothermal fields to reduce high upfront exploration risks and costs.

### Technology Development

- 3D-seismic
  - Remote sensing
  - Geothermometry
  - Shallow temperature surveys
  - Integrated subsurface models
  - Advanced processing of data
- 
- All data collected through DOE-funded projects will be integrated into the National Geothermal Data System (NGDS)



### Project Highlights

#### • Sierra Geothermal at Alum, NV

Confirmed a 147°C resource using a cost-effective and innovative combination of hyperspectral imaging and coiled-tube drilling techniques.

#### • Ormat at Maui, HI

Demonstrating viability and cost-effectiveness of merged gravity-helimagetics for geothermal exploration.

EGS activities include seven demonstrations and a portfolio of cross-cutting R&D projects.

## EGS Demonstration Projects

| Recipient                              | Project Site           | Site Information   | Status  |
|--|------------------------|--|---|
| AltaRock Energy Inc (\$21.5 M)         | Newberry Volcano, OR   | High potential in an area without existing geothermal development                          | Completing EA   |
| NakNek Electric Association (\$12.4 M) | NakNek, AK             | Located in remote location in Alaska without existing geothermal development               | Financial difficulties; cleaning and logging will be initiated next month                       |
| TGP Development Co. (\$10.4 M)         | New York Canyon, NV    | Site adjacent to existing hydrothermal sites and shows high temperatures at shallow depths | Waiting for FONSI from DOE  |
| Ormat Technologies, Inc. (\$4.3 M)     | Desert Peak, NV        | Adjacent to existing hydrothermal sites  | Chemical Stimulation (Stimulation Phase 3)  |
| University of Utah (\$8.9 M)           | Raft River, ID         | Improve performance of the existing Raft River geothermal field                            | Induced Seismicity draft report under review  |
| Ormat Technologies Inc (\$3.4 M)       | Bradys Hot Springs, NV | Improve performance of the existing geothermal field                                       | Building geologic and structural 3D model   |
| Geysers Power Company, LLC (\$6.2 M)   | The Geysers, CA        | Two existing wells will be reopened and deepened for injection and stimulation             | Drilling complete (discovered hottest well in US at ~750° F), infrastructure being put in place |

### Cross-Cutting Component R&D

- Tools (e.g. smart tracers, induced seismicity) and models that better characterize fractures
- High-temperature and high-pressure tools, sensors and equipment
- Advanced drilling systems to reduce drilling time and cost
- Validation of CO2 as a working fluid

### Current Goals

- Establish technical feasibility of 5 MWe by 2020 and sustain for 5 years
- Reduce the cost to be competitive with conventional energy sources



## Geothermal Technologies Program Peer Review June 6-10 in Bethesda, MD Bethesda North Marriott

- Principal investigators will present the results of their projects for peer review
- Approximately 140 projects will be presented, representing a total investment of over \$340 million
- Meet the program staff and network with other stakeholders



## R&D FOA

The Program is preparing to release a geothermal R&D FOA in early June.

### Potential Topics:

- Advanced exploration technologies
- Advanced drilling and well completion technologies
- Tools and monitoring systems for EGS stimulation

Sign up to receive notifications when FOAs are released :  
[www.geothermal.energy.gov](http://www.geothermal.energy.gov)

# Thank you

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