

FORO ENERGY

LASER-MECHANICAL DRILLING FOR GEOTHERMAL ENERGY

PROJECT TITLE:	Low-Contact Drilling Technology to Enable Economical EGS Wells		
ORGANIZATION:	Foro Energy, Inc.	LOCATION:	Littleton, CO
PROGRAM:	FOA1	ARPA-E AWARD:	\$9,141,030
TECH TOPIC:	Renewable Power Generation	PROJECT TERM:	1/15/10 - 9/30/13
WEBSITE:	www.foroenergy.com		

CRITICAL NEED

Geothermal energy is a potentially vast source of clean baseload electricity in the U.S. However, it is difficult and expensive to penetrate the ultra-hard rock formations found at many prospective geothermal sites. Conventional drill bits penetrate ultra-hard rock formations slowly and wear down quickly, which makes the drilling process time consuming and expensive. More economical drilling methods are required to enable access to next-generation energy resources, including geothermal and natural gas.

PROJECT INNOVATION + ADVANTAGES

Foro Energy is developing a unique capability and hardware system to transmit high power lasers over long distances via fiber optic cables. This laser power is integrated with a mechanical drilling bit to enable rapid and sustained penetration of hard rock formations too costly to drill with mechanical drilling bits alone. The laser energy that is directed at the rock basically softens the rock, allowing the mechanical bit to more easily remove it. Foro Energy's laser-assisted drill bits have the potential to be up to 10 times more economical than conventional hard-rock drilling technologies, making them an effective way to access the U.S. energy resources currently locked under hard rock formations.



A high-power laser beam leaving Foro Energy's drill bit and striking a hard rock formation.

IMPACT

If successful, Foro Energy's technology would be a key enabler of economical access to the estimated over 100,000 megawatts of baseload geothermal electrical power in the U.S. by 2050.

- **SECURITY:** Increased access to domestic energy sources like geothermal and natural gas would help break U.S. dependence on foreign energy sources.
- **ENVIRONMENT:** Geothermal resources are a clean, renewable source of baseload electrical power.
- **ECONOMY:** Cost-effective access to domestic energy resources could help spur expansion of the U.S. geothermal and natural gas industries.
- **JOB:** Expanding the domestic geothermal and natural gas industries would help create energy exploration and production jobs for American workers.

CONTACTS

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