

## Investing in Advancing Geothermal Technology

*Adapted from Information by the U.S. Department of Energy*

The U.S. Department of Energy (DOE) has announced seven projects will receive a total of nearly \$11.4 million to advance geothermal energy development. "Geothermal energy is a clean and efficient baseload energy resource, making it an important part of our nation's diverse energy portfolio," U.S. Secretary of Energy Rick Perry said. "Developing new, efficient drilling technologies will reduce these costs and increase the availability of this domestic renewable energy resource."

The projects will focus on early-stage research and development (R&D) projects exploring groundbreaking technologies for drilling geothermal wells, including reducing nondrilling time, improving rates of penetration (ROP), and identifying methods to accelerate the transfer of geothermal drilling and related technologies from the laboratory to the marketplace.

### Selected projects and the items they are developing and testing include:

- **Argonne National Laboratory** - Low-cost materials using superhard nanocomposites combined with ultrafast surface treatment to create new drill bits with tunable properties capable of doubling ROP for drilling geothermal wells.
- **General Electric Company, GE Global Research** - Directional drilling orientation sensor capable of operating at 570°F (300°C) for 1000 hours; this will allow measurement-while-drilling (MWD) at significantly higher temperatures for geothermal drilling.
- **Oklahoma State University** - Detailed model for drill bits based on tracking cutter wear from rock/bit interactions and then designing a system to optimize geothermal drilling based on data from the model.
- **Sandia National Laboratories** - Sensing tools, algorithms, and actuators for an intelligent drilling architecture which optimizes how deep the drill cutter goes, leading to longer life for downhole drilling components, reduced unplanned trips, and more consistent drilling rates.
- **Sandia National Laboratories** - All metal downhole motor which turns drilling fluid flow into torque. This motor will remove temperature limitations, reduce vibration, and enable directional drilling into high-temperature reservoirs.
- **Texas A&M Engineering Experiment Station** - Drill bit system which uses nanosecond microplasma discharge to create localized shock waves which initiate microcracks ahead of the bit. This would make it easier to cut rock and ultimately double ROP for drilling geothermal wells.
- **University of Oklahoma** - Smart lost circulation materials (LCM) using shape memory polymers activated by geothermal temperatures to prevent the loss of fluid into fractured rock next to the drilled wellbore. The smart LCM expands within the fractures to reduce nondrilling time and strengthen the wellbore in high-temperature drilling operations.

DOE's Geothermal Technologies Office supports early-stage R&D to achieve necessary technological breakthroughs.

*Like what you see? Have a suggestion or comment?*

*Tell us what you think of*

*E-News Flash by WorldWide Drilling Resource®*

*E-mail: [e-news@worldwidedrillingresource.com](mailto:e-news@worldwidedrillingresource.com)*

**bauma**  
APRIL 8-14, 2019, MUNICH  
[www.bauma.de](http://www.bauma.de)

