

# PLUG INTO THE PLANET

**FORGE**  
U.S. Department of Energy

## FRONTIER OBSERVATORY FOR RESEARCH IN GEOTHERMAL ENERGY

### NATURAL GEOTHERMAL SYSTEMS

The presence of the hot rocks, permeability, and fluid underground creates natural geothermal systems. Small underground pathways conduct fluids through the hot rocks, carrying energy in the form of heat through wells to Earth's surface when the conditions are just right. At the surface, that energy drives turbines and generates electricity.



Hot Rocks



Underground Fluid



Natural Permeability

### ENHANCED GEOTHERMAL SYSTEMS

Sometimes conditions are not perfect for natural geothermal systems; the rocks are hot, but they are not very permeable and contain little water. The injection of fluid into the hot rocks enhances the size and connectivity of fluid pathways by re-opening fractures. Once created, an enhanced geothermal system (EGS) functions just as a natural geothermal system does. The fluids carry energy to the surface, driving turbines and generating electricity.



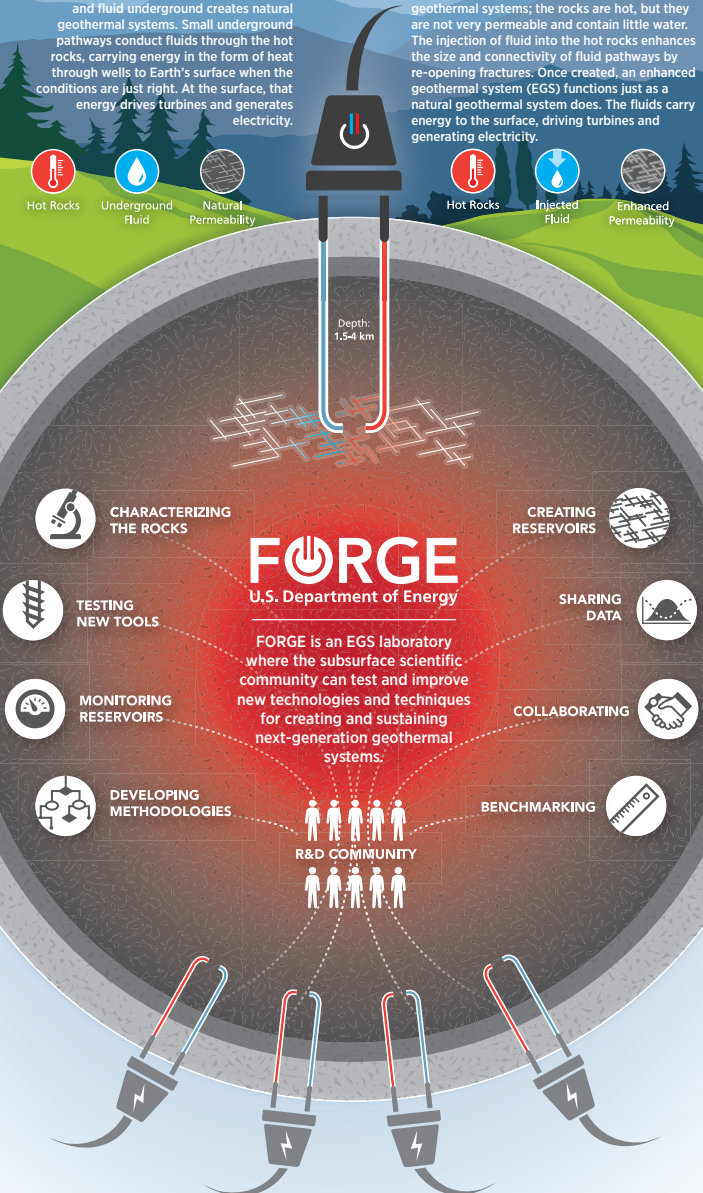
Hot Rocks



Injected Fluid



Enhanced Permeability



REPRODUCIBLE RESULTS = TREMENDOUS POTENTIAL

**100+ GWe**

OF ECONOMICALLY VIABLE CAPACITY

More than 100 GWe (gigawatts electric) of economically viable capacity may be available in the continental United States, representing a nearly **100-fold increase** over present geothermal power generating capacity.

**100 MILLION**

AMERICAN HOMES POWERED WITH GREEN ELECTRICITY

This potential could supply power to 100,000,000 homes in the United States, and it represents a domestic energy source that is clean, reliable, flexible, and renewable.

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# FORGE

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The Energy Department envisions **FORGE** as a dedicated site where scientists and engineers will be able to develop, test, and accelerate breakthroughs in enhanced geothermal system (EGS) technologies and techniques.

EGS is the new frontier in renewable energy: man-made, electricity-producing geothermal reservoirs that can be created anywhere on the planet where there is accessible hot rock.

**FORGE**'s mission is to enable cutting-edge research and drilling and technology testing, as well as to allow scientists to identify a replicable, commercial pathway to EGS. In addition to the site itself, the **FORGE** effort will include a robust instrumentation, data collection, and data dissemination component to capture and share data and activities occurring at **FORGE** in real time. This innovative research, coupled with an equally innovative collaboration and management platform, is truly a first-of-its-kind endeavor.

**For more information go to**

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