

## Clean Domestic Power

The U.S. Department of Energy's (DOE) Geothermal Technologies Program (GTP) is committed to developing and deploying a portfolio of innovative technologies for clean, domestic power generation. GTP conducts research, promotes development, and builds partnerships to establish geothermal energy as a significant contributor to America's future electricity generation.

Geothermal energy, a virtually untapped energy resource from the heat of the earth, is more important than ever before because it has a small environmental footprint, the ability to produce energy consistently around the clock, and emits little or no greenhouse gases.

GTP's efforts support the geothermal and renewable energy industries by encouraging the rapid development, demonstration, and deployment of innovative technologies in the private and public sectors.

### Education and Collaboration

GTP is establishing education and workforce development projects to meet the needs of a growing



Robert Blackett, Utah Geological Survey/PIX 13995

geothermal industry through research, university curriculum development, and co-sponsored internship programs.

As a founding member of the International Partnership for Geothermal Technology, DOE plans to increase technology transfer and expand international market penetration.

### The National Geothermal Data System

The National Geothermal Data System seeks to reduce up-front risks to geothermal developers by providing a distributed system linking geothermal data sets across the country. Assessing and categorizing the nation's geothermal resources and linking all data in a publicly accessible data system will stimulate the growth of the geothermal industry.



Nicole Reed/PIX 17304

The wellhead at a potential Enhanced Geothermal Systems site in Desert Peak, Nevada.

**As a part of America's bold investment in clean energy generation and job creation, GTP supports the mission of DOE and the Administration to:**

1. Get new technologies to market faster
2. Provide clean baseload power
3. Accelerate the clean energy economy
4. Create jobs and revitalize local economies
5. Build toward long-term energy independence

## The Forefront of Innovation

Geothermal energy is moving to the forefront of innovation and demonstrating uptake in new projects across the United States.

### Innovative Exploration Technologies

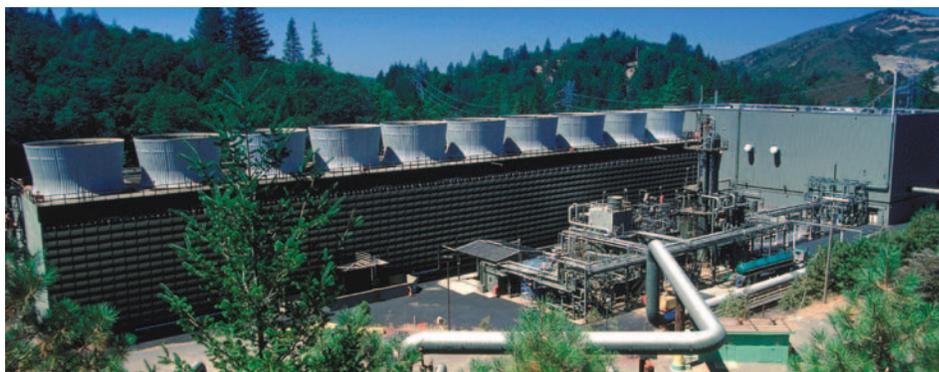
The advancement of exploration technologies has the potential to substantially lower exploration risks and reduce upfront geothermal development costs. The program's aim is to develop technology that enables GTP to locate approximately 30 GW of undiscovered geothermal resources in the western United States. Advanced exploration technologies include remote sensing and new geophysical surveys. These new geothermal demonstration projects will validate the performance of new technologies and establish financial and technical baselines.

### Low-Temperature

While some water resources are not hot enough to be harnessed in conventional steam-powered generators, low-temperature geothermal resources present an enormous opportunity for geothermal power generation. Binary cycle systems have the capacity to convert lower temperature fluids into electrical power. Advances in this technology have lowered the temperature requirement for geothermal electricity production.

### Enhanced Geothermal Systems

Enhanced Geothermal Systems (EGS) are engineered reservoirs created to produce energy from geothermal resources deficient in water or permeable rock. EGS release no greenhouse gases and are a clean and renewable source of baseload power. EGS in multiple geological environments at various depths will enable geothermal energy to increase in scale and be an important contributor to the U.S. energy portfolio.



Calpine Corporation/PIX17270

Geothermal energy plant at The Geysers near Santa Rosa in Northern California, the world's largest electricity-generating geothermal development.

### New R&D Field Testing Of Innovative Exploration Technologies Through 2016

Subsurface imaging, geothermometry, airborne gravity and magneto-telluric surveys, hyperspectral surveys, InSar, advanced seismic, technology transfer from oil and gas, shallow temperature surveys, integrated subsurface models.

### Co-Production

In the United States, an average of 10 barrels of water is produced with every barrel of oil. Currently treated as a waste product, the majority of co-produced water and steam are warm enough to generate electricity. This could provide additional value streams to extend the life of mature oil and gas fields, while adding a significant, clean source of electricity to America's energy portfolio.

### Geopressured Energy

Geopressured energy is a type of geothermal resource occurring in deep basins where the fluid and gas are under very high pressure. GTP's strategy in this area involves improving power turbines that simultaneously harvest thermal, mechanical, and chemical energy at a reasonable cost.

### Funding Opportunity Announcements

GTP funds research, development, demonstrations, and analytical activities through Funding Opportunity Announcements (FOA). Research projects are performed under cost-shared awards to private companies and academic institutions via competitive solicitations and through work with DOE national laboratories.

### For More Information

Visit the GTP website at [www.geothermal.energy.gov](http://www.geothermal.energy.gov) for more information on the program, to sign up for future FOA notifications, and to get details on GTP-funded R&D projects in our Projects Database.

Questions regarding GTP activities should be directed to [geothermal@ee.doe.gov](mailto:geothermal@ee.doe.gov).