

# Geothermal companies investigate water injection

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American energy companies are experimenting with bringing their own water to produce geothermal energy.

Previous geothermal energy facilities were situated in areas where steam was produced naturally underground. The water-injection technology "offers the opportunity of creating additional reserves," said Mark Walters, a senior geologist at Calpine Corp. (CPN), the largest U.S. geothermal power producer. "The heat is a resource in areas around existing plants, but right now we really can't get at" it.

The company began its experiment yesterday 100 miles northeast of San Francisco. The procedure involves injecting water 2 miles underground.

Ernest Majer, an energy geophysicist at Lawrence Berkeley National Laboratory, said that geothermal plants could provide 100 gigawatts of power by 2050, expanding its role from 1 percent to 10 percent of America's energy capacity. "There's a lot of hot rock out there," Majer said. "That would replace our nuclear power plants."

Since 2009, the U.S. Department of Energy has earmarked \$182 million in grants for enhanced geothermal systems (EGS), where water is circulated underground to warm parts of the earth. The water cracks stones, increasing the heated surface area. The water, now heated to steam, is piped back to the surface, where it drives a turbine.

The process is analogous to fracking -- the technique where sand and water are injected into oil and gas wells at high pressure, fracturing the rocks so the fuel can be extracted -- but is done at smaller scales. "We are trying to create a cloud of small fractures," said Walters. "We're talking millimeter fractures."

However, some EGS plants have run into trouble. A plant in Switzerland was shut down in 2006 after nearby residents complained of tremors.

The process is also far from prime markets. "There are few places where EGS can be considered commercial at present," said Ann Roberston-Tait, business development manager at GeothermEx Inc., a consulting firm.