

EPREUVE SPECIFIQUE MENTION

« SECTION EUROPEENNE »

Académie de Nantes, Binôme : Anglais/SVT

**Thème 2 - Enjeux planétaires contemporains**  
**2-A - Géothermie et propriétés thermiques de la Terre**

## Joining the Energy Underground: Residential Geothermal Power Systems

**Question:** After presenting the document and its content, answer the following question: present the main characteristics of such a zone and explain the origin of geothermal manifestation.

### SCIENTIFIC AMERICAN™

Homeowners looking to go green and lower their utility bills can install a residential geothermal system November 23, 2013

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Gretar Ivarsson

Dear EarthTalk: How are heating, cooling and electricity produced by geothermal energy? I don't understand how it works.

*Delano Stewart, Wyandanch, NY*



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The term “geothermal” is derived from the Greek words for Earth (geo) and heat (therme). In essence geothermal energy is power harnessed from the Earth itself. Heat from the Earth's core, which averages about 6,650 degrees Fahrenheit, emanates out toward the planet's surface. Heated springs and geysers up to three miles underground can be accessed by special wells that bring the hot water (or steam from it) up to the surface where it can be used directly for heat or indirectly to generate electricity by powering rotating turbines. Since the water under the Earth's surface is constantly replenished, and the Earth's core will continue to generate heat indefinitely, geothermal power is ultimately clean and renewable.

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15 Today there are three main methods for harvesting utility-grade geothermal energy: dry steam, flash steam and binary-cycle. The dry steam process brings steam up directly from below to drive turbines that power electricity generators. Flash steam plants bring the hot water itself up from below; it is then sprayed into a tank to create steam to drive the turbines. These two methods are the most common, generating hundreds of megawatts of electricity across the American West, Europe and elsewhere. But expansion is limited as these plants only work in tectonic regions where it is easier to access ground heated water.

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Geothermal may be in its infancy in the U.S., but it is a big player in Iceland, which derives 26.5 percent of its electricity needs from geothermal, and in New Zealand, which gets 10 percent of its electricity likewise.

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