



## Grenada Geothermal Resource Development

- Clean Sustainable Baseload Energy -  
Geothermal Resources

No. 2 Vol. 1



### Where Is Geothermal Energy Found?

Some visible features of geothermal energy are volcanoes, hot springs, geysers, and fumaroles. **But you cannot see most geothermal energy.** Usually geothermal energy is deep underground. There may be no clues above ground to what exists.

Geothermal scientists use many methods to find geothermal resources. They may:

- Study aerial photographs and geological maps;
- Analyze the chemistry of local water sources and the concentration of metals in the soil; or
- Measure variations in gravity and magnetic fields.

The existence of a geothermal resource is confirmed by drilling wells to measure underground temperatures, and to understand the characteristics of the geothermal resources.

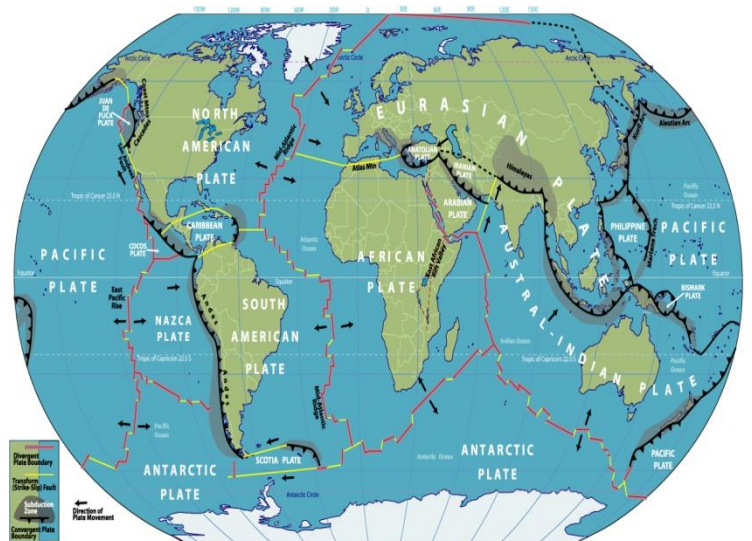


The earth is a hotbed of geothermal energy. The most active geothermal resources are usually found along major plate boundaries where earthquakes and volcanoes are concentrated.

Most of the geothermal activity in the world occurs in an area known as the **"Ring of Fire."**

The Ring of Fire rims the Pacific Ocean and is bounded by Japan, the Philippines, and even North, Central, and South America.

In the Caribbean the small volcanic Eastern Caribbean islands in the archipelagic sequence is known to have exhibited geothermal activity and manifestations. There are hot and boiling springs in Dominica, St. Lucia, St. Vincent and Grenada.



## Geothermal Resources

There are four main kinds of geothermal resources. They include:

- Hydrothermal,
- Geopressured,
- Hot dry rock, and
- Magma.

At present, hydrothermal resources are the only kind in wide use. The other three resources are still in the infant stages of development.

**Hydrothermal resources** have the key ingredients of water (*hydro*) and heat (*thermal*). With this resource, reservoirs of steam or hot water occur naturally where magma comes close enough to the surface to heat ground water trapped in fractured or porous rocks, or where water circulates at great depth along faults within the earth. Hydrothermal resources are used for different energy purposes depending on their temperature and how deep they are.

### Use Of Resource – (Hydrothermal heat sources)

#### Low Temperature: "Direct Use" or Heating

When the temperature of a hydrothermal resource is around 50°F and up, it can be used directly in spas or for other uses. In some temperate regions (e.g. Iceland and France), geothermal heat is used for heating public buildings, schools, and homes.

In the United States, geothermal heat pumps are used in forty-five (45) states, to heat and cool homes and buildings. Idaho, Oregon, Nevada, and some other states use geothermal energy to heat entire districts.

Heat from geothermal resources is also used to dry ceramics, lumber, vegetables, and other products.



#### High Temperature: Producing Electricity

When the temperature of a hydrothermal resource is around 220°F and up, it can be used to generate electricity. Most electricity-producing geothermal resources have temperatures from 300 to 700°F, but geothermal reservoirs can reach nearly 1,000°F. Presently, new technology allows for using low temperatures to produce electricity, e.g. *Enhanced Geothermal Systems*.

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