Module 2

How Is Electricity Generated and Distributed?

Unit 4 Energy Sources

Glossary

(to) harness: to control and make use of
reservoir: a large natural or artificial lake used as a source of water supply
brine: water strongly impregnated with salt
viable: capable of working successfully

Geothermal energy

Geothermal energy involves **harnessing** the heat that is trapped underneath the Earth's surface for generating electricity. At the present moment, geothermal energy accounts for less than 1% of all global electricity use. However, in certain countries geothermal generates a substantial share of the nation's electricity.

Today there are four possible ways for generating geothermal energy. Hot water **reservoirs** are large subsurface reservoirs of warm water. These reservoirs are typically not warm enough for generating electricity but they do find use in space heating. Natural steam reservoirs are rare, but highly desirable geothermal heat sources as they can be directly used to turn a steam turbine.

Geopressured reservoirs consist of **brine** that is completely saturated with natural gas, at high pressure. These reservoirs may one day become an important source of geothermal power. Natural geothermal energy can produce temperatures of 190°C at a depth of 20,000 feet under the surface. This temperature is sufficient for electricity generation. Hot dry rock is the same as the previous scheme except it occurs at lesser depths. Finally, it is conceptually possible to use molten magma for geothermal energy. Geothermal energy is only a **viable** source for electricity in certain locations. However, around the world, there are large geothermal power plants in several nations including Iceland, the Philippines and the United States. Iceland produces large amounts of electricity from its geothermal reservoirs, such as the Svartsengi power plant. The Svartsengi power plant produces approximately 77 MW of electricity and 475 L/s of almost boiling water. When one drives into Reykjavik from the surrounding countryside, a large metal pipeline, which carries hot water to the city, runs parallel to the highway. The World's largest geothermal power facility is The Geysers, which is located north of San Francisco. The Geysers is a 70 km^2 facility that had a capacity to generate 8200 MW of electricity, in 2005.

(Adapted from "How Geothermal Energy Works", http://www.ucsusa.org, 2014)

Understanding the text

1. Find verbs in the text that are associated with the following terms and expressions.

1. ..... the heat
2. ..... electricity
3. ..... a steam turbine
4. ..... temperatures
5. ..... molten magma

2. Complete the following sentences. Your answers must be related to concepts contained in the text.

1. Heat from the Earth can be used as an ..... in many ways, from large and complex power stations to small and relatively simple pumping systems. This heat energy, known as ....., can be found almost anywhere.
2. Many regions of the world are already .....
3. Steam can be generated in various ways, including .....
   .....
4. Unfortunately, geothermal energy .....
5. Nations such as ..... have large geothermal power plants.

Writing

3. Write two other renewable resources you know of and how do they work.

1. ..... :
   .....
2. ..... :
   .....