



**“Geothermal power”** is a way of generating heat and electricity from hot underground rocks. This form of power generation does not create pollution, and is renewable (as long as we do not extract too much, or the rocks cool down). However, we can only use this method to generate our power in certain places in the world, where suitable hot regions are near the surface.

Holes are drilled down to the hot region, and water is pumped down one. This water comes back up the other holes at a high temperature, usually much hotter than 100°C. Water can be a liquid above 100°C, so long as it's under pressure. When it reaches the surface and the

pressure is released, it “flashes” into steam, which we can use to heat houses, or to turn turbines and generate electricity. Sometimes there is hot water already underground, as in this article:-

*Extract from National Geographic magazine, June 1997*

Indonesia has more volcanoes than any other country, and despite huge oil reserves it is investing millions of dollars developing geothermal power.

One of the biggest projects is at Gunung Salak, about 60 kilometres south of the capital Jakarta on the country’s most populous island, Java.

The long-dormant Salak volcano is between 260,000 and one million years old. Scientists believe that drilling into its side will not release hot lava. It will, they say, let out valuable high-pressure hot water, which is trapped between 1,000 metres and 3,000 metres below the surface. This, in turn, will be “flashed” into steam pressure for driving turbines.

The water comes from a complex geological hot water field, known as Awibengkok, and is relatively free of minerals (which makes it particularly useful for power generation). Water from some fields is corrosive because it is laden with chemicals that can rapidly scale up pipework. In one geothermal plant in the Philippines, this caused problems in just two weeks.

The production of geothermal energy requires a heat source relatively close to the Earth’s surface. Internal radioactivity is one potential source, although in this case, the water is heated by molten rock, or “magma”, which is in turn related to volcanic activity.

Indonesia sits on the edge of the “Pacific Ring of Fire”, a vast circular tectonic plate boundary stretching from California to Japan, the Philippines and the southern Indonesian islands.

The field has produced 110 megawatts of power since the first elements came on stream in 1994, and it is now being expanded to produce 330 megawatts. “The output from this project will put Indonesia into fifth place in the world for geothermal power”, says Olin Whitescarver, general manager for American oil and power firm Unocol Corporation.



Answer these questions in sentences:

1. What do scientists think they will find if they drill into the side of the Salak volcano?
2. Why is the water from the Awibengkok field particularly suitable for a geothermal power station, and what would happen if the water were not like this?
3. How is the water in the Awibengkok field heated?
4. What are the advantages of geothermal power over other methods?