Enhancement of Binary Geothermal Power Plants by Using Nanoparticles and It's Application in Egypt

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In comparison to other energy sources, geothermal energy is a safe option. Since it is clean and green, the world has begun to pay attention to geothermal energy. It produces enormous quantities of energy while releasing zero greenhouse gases. Despite their efficiency, several existing geothermal systems have dangerous design flaws, such as the use of reservoir water directly. This could result in the destruction of power plants, as well as the migration of toxic gases to the Earth's atmosphere, resulting in air pollution. The goal of this project is to boost the efficiency of geothermal power plants that use a binary system. The thermal properties of water that transfers geothermal heat are enhanced by adding carbon nanotubes, and the effect of different concentrations is studied to figure out the optimum concentration which has the highest thermal conductivity. After further investigation, it was discovered that nanofluids have a higher thermal conductivity than pure water; the concentration of 0.05%vol had the highest thermal conductivity, reaching 3,000 W/mK. Finally, carbon nanotubes can significantly improve the thermal conductivity of water, which is used to transfer geothermal heat. This will result in more heat being transferred in less time, resulting in more electricity being generated at a lower cost.

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