Abstract: Geothermal energy is an indigenous clean energy; its application has long been proved beneficial to social economy. Though there is a large scale direct usage of geothermal energy for about 6 100m² of district heating projects in Shandong province, no geothermal power plant built there due to lack of high enthalpy geothermal fluid. The paper aims at finding higher enthalpy geothermal energy at the deep part of the East Linqing depression in Shandong Province. Based on the regional geology information, the paper established that there are huge layers of Ordovician and Cambrian carbonate strata buried at a favorable depth, which has naturally developed fissures by water corrosion and faulting, holding geothermal fluid, making it an ideal geothermal reservoir for development. By rechecking the seismic interpretation and drilling results obtained during petroleum exploration, the author compiled the average geothermal gradient map of Cenozoic, and the spatial distribution map of Cambrian-Ordovician strata. Considering the whole Cambrian-Ordovician strata as the heat source for geothermal power plant construction via Enhance Geothermal System technology, the lowest temperature limit for utilization of the thermal fluid set to 70℃, the coefficient of the thermal energy of geothermal fluid change into electricity set to 7%, the paper estimated the total thermal energy stored in the Cambrian-Ordovician karst geothermal reservoir for power generation is $127 \times 10^{19}$ J, and the power
The generation capacity is 94.20 ×10^3 MWe at the study area. The high temperature zones with temperature greater than 200 °C can meet the electricity needs of the study area.

**Key words:** Geothermal energy, High enthalpy, Enhanced geothermal system, Geothermal power plant

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