

An enhanced geothermal system

DMITRIEV, Alexei^{1*} ; KURYANOV, Roman²

¹Institute of Space Science, National Central University, Jungli City, Taiwan, ²Private Job

We introduce a new technology of heat extraction from the deep crustal rocks known as an enhanced geothermal system (EGS). EGS is based on an innovative way to drill deep and ultra-deep (6-12 km) geothermal wells with a speed of up to 30 meters per hour, with a diameter of 250 mm to 500 mm at a temperature in the bottom of the well up to 400C. This allows building environmentally friendly petrothermal power plants and heat sources. EGS are built in a number of regions in Russia from the European part to Siberia and Far East. The pilot scientific and experimental petrothermal power plant is characterized by rated capacity of 24 MW with an annual power generation of 187,4 millions KWh and heat supply of 905 thousand Gcal/year. The estimated technical & economical parameters of the petrothermal power plant are the following (all costs are in 2010 year prices):

- construction period - 6-10 months ;
- cost of electricity produced - 0,01 USD/kWh;
- cost of heat produced - 1,30 USD/Gcal;
- total investment in the power plant - 44 million USD;
- lifetime - 40 years;
- average payback period - 2 years.

Contact person for further information: Roman M. Kuryanov, e-mail: roman.taiwan@gmail.com

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