

## Project Proposal 16

Project title:	GEOHERMAL UTILIZATION CHP PLANT IN TSETSERLEG, MONGOLIA
<b>Project background, project outline</b>	<p>~ In the "National Program for Renewable Energy /2005-2020/" approved by the State Great Khural's Resolution No 32 June 9, 2005, it was pointed out to perform a surveys to determine locations with significant applicable geothermal resources, develop techno-economic feasibility study to utilize geothermal resources for urban areas energy supply and implement actual projects based on the results of these studies.</p> <p>~ "Pre-feasibility study of Geothermal Project in Tsetserleg, Mongolia" was carried out by Icelandic companies in August 2004. Thermo-economic analysis of a new geothermal utilization CHP plant in Tsetserleg was studied by the Mongolian researcher at the University of Iceland in April, 2005.</p>
<b>Production scale:</b>	To be estimated 1.9 MW <sub>e</sub> and 16.7 MW <sub>t</sub>
<b>Market orientation and market analyses, market survey:</b>	The number of inhabitants is 18,136 (Census 2000). The plant could supply the consumers at Tsetserleg center (Erdenebulgan soum) by electricity or to be connected to the Central Energy System in case of electric production exceeded the consumers' demand. The heat supply of the consumers at Tsetserleg.
<b>Cooperation mode:</b>	Based on their experience in geothermal project, potential foreign expert advice will be required for a geothermal research work, feasibility study, and construction work if it feasible.
<b>Total investment</b>	Estimated 8.66-12.41 million US\$ (2005)
<b>Requested Investment from foreign partners:</b>	Loan/private investment BOT Interest rate of 2 % and term of 15 years
<b>Project venue, construction venue:</b>	Tsetserleg center, Arkhangai aimag, Mongolia The geothermal field is located 25 km northeast of Tsetserleg. Tsetserleg is located 500 km west of the capital, at an elevation of 1,691 m a.s.l and was connected to the CES through 110 kV transmission line. The center lies on main auto-road which connects western and central region of Mongolia.
<b>Occupation area and construction area</b>	Expected geothermal site area – approx. 0.5 km <sup>2</sup> Plant building footprint - 11.5 x 21 meters
<b>Estimated economic benefit</b>	Annual production of electricity and heat - 15 GWh and 484,533 GJ; Annual revenue - 2.32-2.76 million US\$; Unit cost of electricity - 3.01 US\$/kWh; Unit cost of heat - 3.8 US\$/GJ (for a 5 km long transmission pipeline) or 4.7 US\$/GJ (for a 20 km); Annual O&M cost of the plant - 0.68 million US\$; IRR - 1.2-40.2% (with Carbon offset and discount rate of 10%); NPV@10% - 1-11.9 million US\$ (with Carbon offset).