

## Development of a geoscientific framework for geothermal exploration and energy utilization in Mongolia: **Technical summary**

The existence of numerous hot springs in the Hangai mountains is indicative for large geothermal energy resources, which are remnants of its volcanic geological history. Previous studies have shown that a combined, geothermal heat and power plant for Tsetserleg could provide cheap and clean energy. With this project, we will equip the Institute of Astronomy and Geophysics in Ulaanbaatar with modern geophysical measurement stations. Together we will establish scientific methods to image the geothermal reservoir near Tsetserleg, which feeds the hot springs in Tsenkher and Shivert. The result will be of great importance for promoting the construction of geothermal power plant.

## WHAT

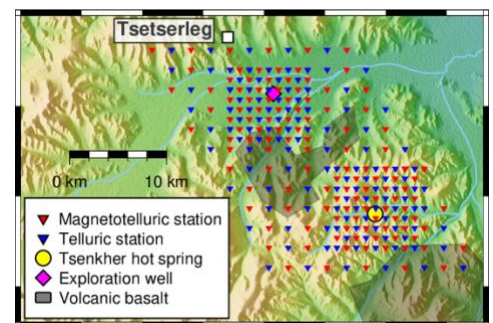
For this project, we will conduct geophysical measurements. The data are used for subsurface imaging and to construct a 3-D geothermal reservoir model to evaluate the potential for heating and energy production.

## HOW

We will use geophysical soundings together with previously conducted geochemical and geological studies. Our measurements take place free of noise and are environmentally friendly.

## WHERE

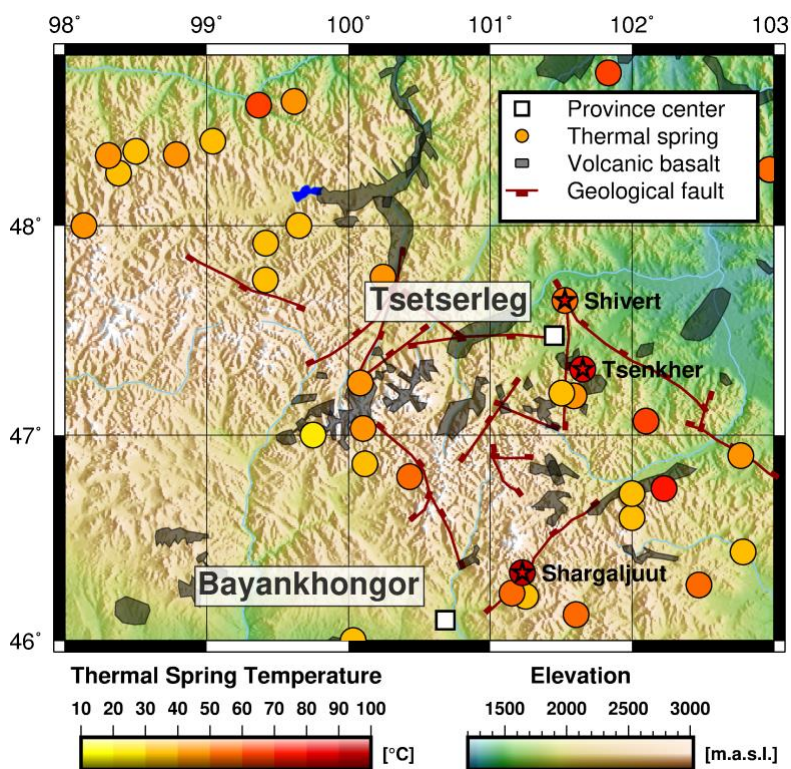
The measurements will be taken at around 200 sites between Tsetserleg and Tsenkher during field surveys in May-June 2019 and 2020.



## WHO

- Mongolian Academy of Sciences, Institute of Astronomy and Geophysics, Ulaanbaatar.
- ETH Zurich, Switzerland, Institute of Geophysics. GEG and EPM groups.
- National Renewable Energy Center, Ulaanbaatar.

Hot Springs of the Hangai Mountains



Geothermal energy utilization at the Tsenkher hot spring (left) is so far limited to greenhouse heating and spas (right).



## CONTACT

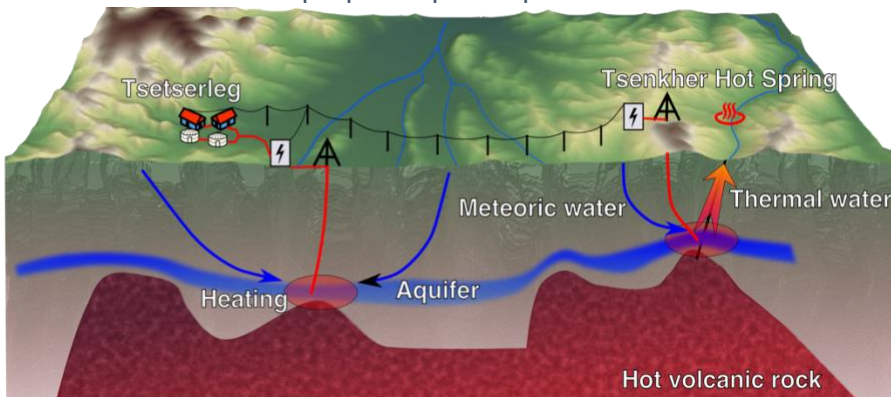
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## Development of a geoscientific framework for geothermal exploration and energy utilization in Mongolia: **Societal relevance**

Hot rock in the subsurface, a remnant from Hangai's volcanic history, heats fluids in the underground. Some of the fluids migrate upwards along geological faults, where they result in hot springs as observed in Tsenkher. With this project we train and educate Mongolian scientists in geophysical subsurface imaging and geothermal exploration for reliable reservoir characterization to promote geothermal development.

Conceptual model for the geothermal system near Tsetserleg and proposed power plants.



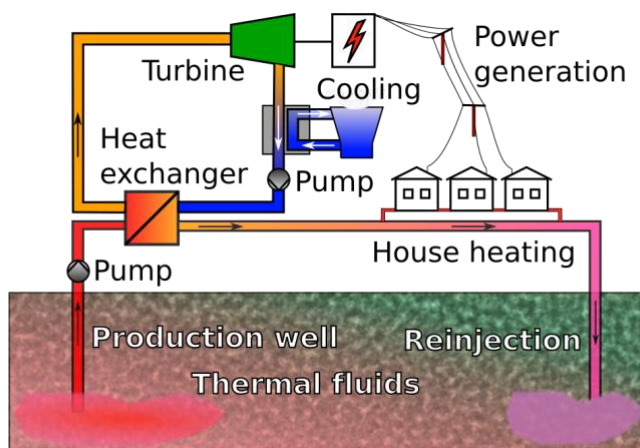
Abandoned exploration well.



## Pre-feasibility study for construction of a combined heat and power (CHP) geothermal plant

The capacity of a geothermal CHP plant in Tsetserleg could reach 1.9 MWe electric power and 16.7 MWt heat production as shown in a study by Purevsurem Dorj from the National Renewable Energy Center in Ulaanbaatar. Such a plant would even exceed the current power and heat consumption in Tsetserleg. Geothermal energy could be a great benefit to all inhabitants. It would result in massively reduced greenhouse gas emissions and lead to improved live and working conditions.

Sketch showing the principles of a CHP plant



## Addressing United Nations' global goals for sustainable development

