The south flank of Caucasus Mountains - 100 mWm$^{-2}$; Plate of Georgia; a) For the west zone 40 mWm$^{-2}$ b) for the east zone 30 mWm$^{-2}$; Adjara-Trialeti folded system a) Central part 90 mWm$^{-2}$ b) the east zone 50 mWm$^{-2}$; Artvin- Bolnisi platform 60 mWm$^{-2}$. 
Most of the 50 geothermal wells in Georgia are of medium (500-1000 m) to moderate (2000-3000 m) depth and supply water at temperatures ranging from 40-60°C and 80-100°C.
Georgia abounds in geothermal resources, concentrated in 44 deposits. According to preliminary estimations, their heat power is 420 megawatts, and elaboration of thermal energy is maximum 2.7 million megawatt/hour/year.

<table>
<thead>
<tr>
<th>Use</th>
<th>Installed Capacity (MWt)</th>
<th>Annual Energy Use $^{2)}$ (TJ/yr = $10^{12}$ J/yr)</th>
<th>Capacity Factor $^{3)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Space Heating $^{4)}$</td>
<td>13.57</td>
<td>130</td>
<td>0.3</td>
</tr>
<tr>
<td>District Heating $^{4)}$</td>
<td>8.74</td>
<td>83</td>
<td>0.3</td>
</tr>
<tr>
<td>Air Conditioning (Cooling)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse Heating</td>
<td>20.27</td>
<td>192</td>
<td>0.3</td>
</tr>
<tr>
<td>Fish Farming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Farming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Drying $^{5)}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Process Heat $^{6)}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snow Melting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathing and Swimming $^{7)}$</td>
<td>30.81</td>
<td>290</td>
<td>0.3</td>
</tr>
<tr>
<td>Other Users (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>73.39</td>
<td>695</td>
<td>0.3</td>
</tr>
<tr>
<td>Geothermal Heat Pumps</td>
<td>0.03</td>
<td>0.16</td>
<td>0.17</td>
</tr>
<tr>
<td>TOTAL</td>
<td>73.42</td>
<td>695.16</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Georgia has a high potential of geothermal resources, some have been in use since ancient times. The major areas of utilization are balneology resorts, local heating systems and greenhouses.
It also should be noted that part of these wells are non-operational. Today the amount of confirmed reserves does not correspond to reality for, under the current conditions of exploitation, well pressure and discharge rates are dropping. Therefore, a reassessment of the geothermal potential of Georgia is of major importance from the standpoint of economic development of the country based upon renewable, ecological cleaner energy source.
Geothermal Circulation System
Tbilisi geothermal deposit

The thermal waters or “sulphur bathes” - therapeutic and spa
Lisi district - house heating
“Varketili” - Oil field

Geological cross-section of Tbilisi thermal deposits

Hydrodynamic relations between three sections
Repair of borehole head constructions and organization of monitoring

Borehole #4T

Borehole #5T

Monitoring equipments
Hydrodynamical and microtemperature monitoring
Determination of hydrodynamic parameters (hydraulic conductivity, transmisivity and storativity etc.)

Slag-testing process on the boreholes #5 “Lisi” and #46 “Varketili”
Reinjection process on the borehole #7 “Lisi”
Variation of hydrodynamic parameters during reinjection on the borehole #7

![Graph showing variation of hydrodynamic parameters over time, with data from 24/10/11 to 25/10/11. The graph illustrates changes in water pressure and temperature over the reinjection period.](image)
Conceptual model

Hydraulic head

Heat flow
Numerical modeling

Water flow from recharge area

Water flow to discharge area
Model simulation
calculation of discharge

Transmisivity of “Lisi” area (left- 3600 m3/day) and totally for North part ((right-7485 m3/day)
Reinjected water mass already totalled to 1275 m$^3$/day in the water balance, while the energy disbalance was reduced to $-1.49 \times 10^{21}$ J/day.
The numerical modeling of the thermal water flow showed that using GCS prolongs the exploitation period of the aquifer and increases the number of users to 100,000.
Thermal water pressure drop in the Zugdidi and Kvaloni well during 35 years

Balance for today (after 35 exploitation)
Boreholes testing process

Borehole Menji #31

Zugdidi #1

Tskvishi #1
Conceptual model

Borders of model
Hydraulic head

Heat flow
GCS testing process in West Georgia
Tsaishi boreholes

Geothermal Circulation System
Balance after installation GCS
Recomendation

- Study geothermal resources on the all territory of Georgia for identify new deposits and reassessment old ones
- Installation new modern technological Geothermal Circulation System
- Support businessman with credits and Guarantees

Thank your for attention