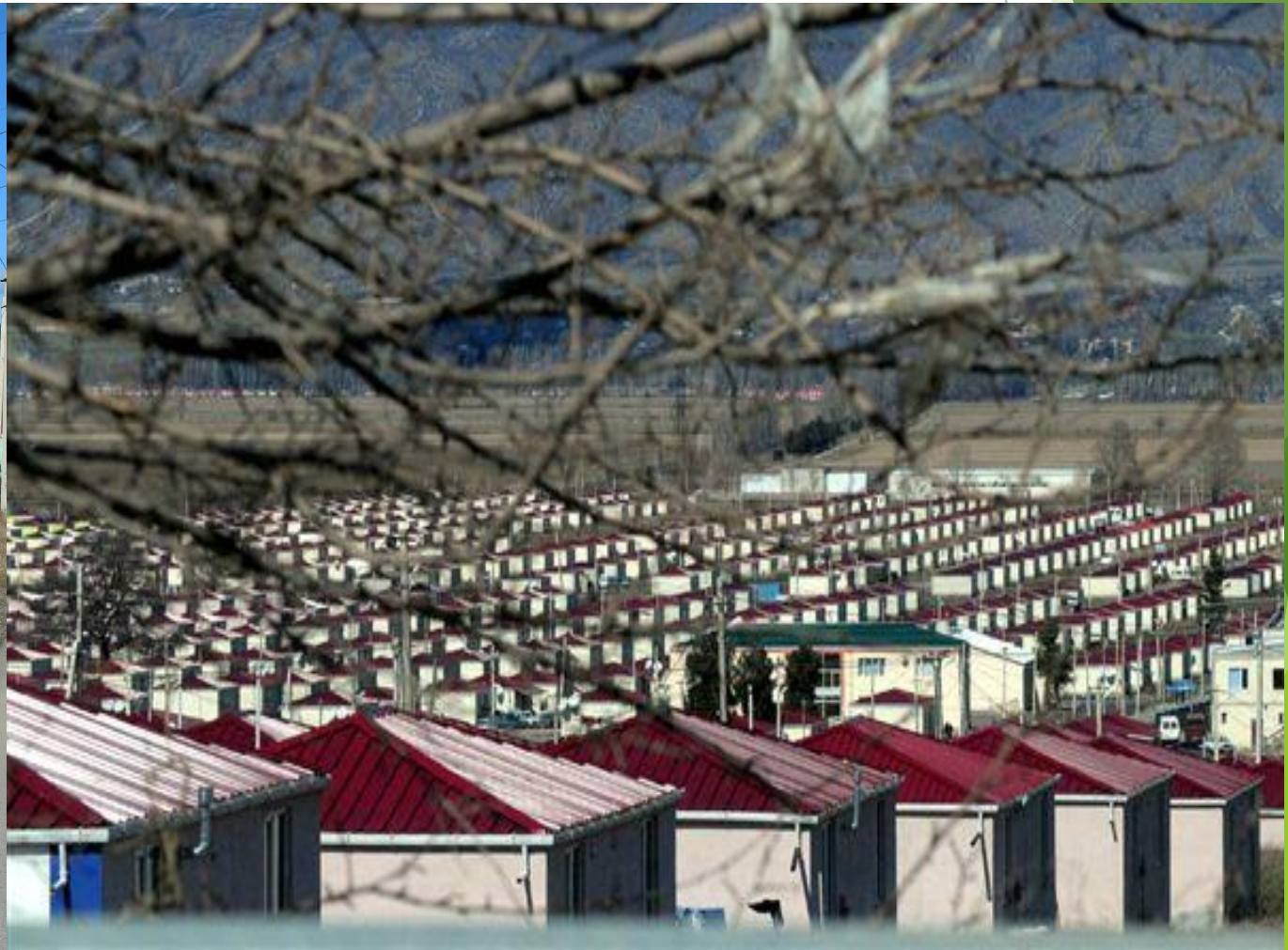


# Geothermal Heating and Cooling systems for 2000 houses for Internally Displaced People in Tserovani, Georgia



# Sustainable Geothermal Heating and Cooling solutions for Georgia



# Results of climate changes in Georgia



- ▶ **Sea level rise**
- ▶ **Increased frequency and intensity of floods**
- ▶ **Landslides**
- ▶ **Mudflows**
- ▶ **Rising temperature**
- ▶ **Increased winds**
- ▶ **Decreased rainfall**
- ▶ **Enhanced evaporation**

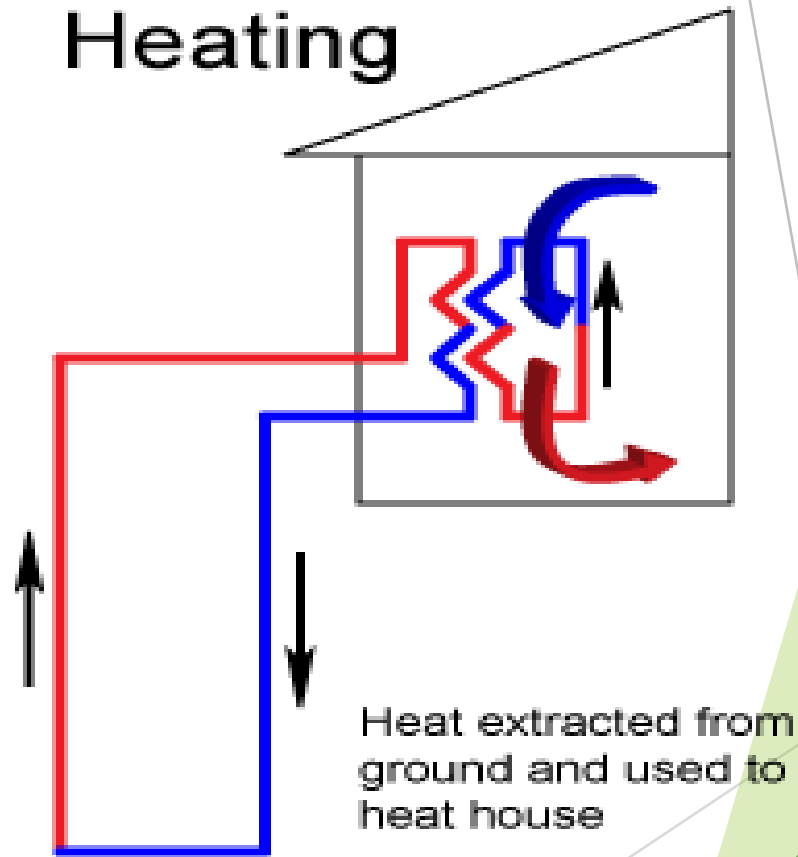
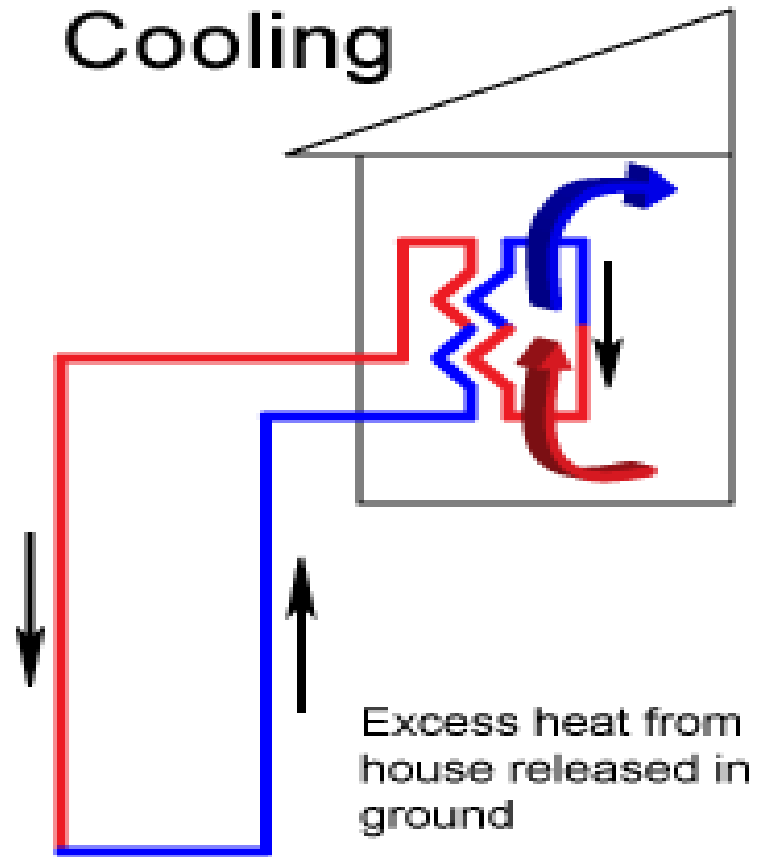
# What is a Geothermal Heating and Cooling system?

Geothermal Heating and Cooling system comprise of three primary parts

- ▶ an earth connection for transferring heat between the earth and a fluid contained in a series of pipes
- ▶ a pump to move heat between the fluid in the earth connection and the building
- ▶ a distribution subsystem for delivering heating or cooling to the building



Geothermal Heat pumps are the most energy efficient means of heating and cooling buildings.



# Greenhouse Gas Emissions in Georgia



- ▶ Georgia emitted approximately 16 million tCO<sub>2</sub>e of greenhouse gases (GHG) in 2012 , which is about 0.03% of the global GHG emissions.

82 % of greenhouse gases emission is from energy use:

- ▶ 24 % - Other Fuel Combustion (mainly in residential and commercial buildings)
- ▶ 28 % - Agriculture
- ▶ 30 % - Transport Sector

The government of Georgia finalized the National Energy Efficiency Action Plan. The government wants to reduce the greenhouse gases emission by using the geothermal heating and cooling systems. This system will also significantly cut down the consumption of gas and electricity.

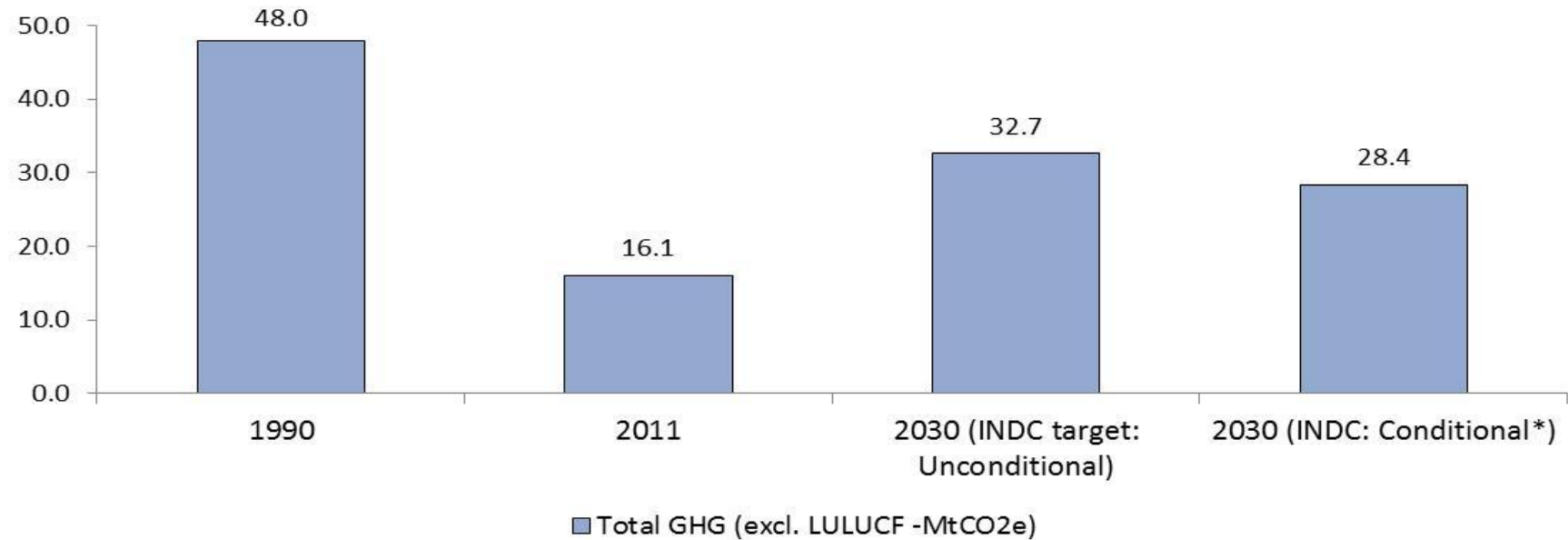


Geothermal heating and cooling systems will be beneficial for the population of Georgia. Monthly electricity costs drop 40 to 60%. A GEL 200 bill becomes about GEL 80. It is not  $\frac{1}{4}$  because the geothermal heating system runs more minutes each hour than electric resistance heat. Air conditioning costs the same as heating. Maintenance costs drop 80 to 90 percent (like a kitchen refrigerator). Maintenance costs drop 80 to 90 percent (like a kitchen refrigerator).





# Greenhouse gases emissions in the base year, the recent data and the target year



The National Energy Efficiency Action Plan outlines a range of energy efficiency measures, such as:

- ▶ Saving energy through industrial and residential sector
- ▶ Efficient designing for industrial facilities and residential buildings
- ▶ Saving energy through industrial and residential sector
- ▶ Energy efficient transport sector

These energy efficiency measures as well as the stimulation of a range of renewable energy sources are also identified in the Technology Needs Assessment that was finalized in 2012.

# Mitigation



- ▶ Georgia has a mitigation to reduce greenhouse gases emissions by 15 % below the Business as Usual (BAU) by 2030
- ▶ The main objective is to improve the country's preparedness and adaptive capacity by developing climate resilient practices that reduce vulnerability of highly exposed communities.
- ▶ The Intended National Determined Contribution mentions that the more ambitious target is subject to technical cooperation, access to low-cost financial resources and technology transfer in energy efficiency.

# Priority for Intended Nationally Determined Contribution

- ▶ Georgia's Intended Nationally Determined Contribution identifies climate actions in the energy sector as a priorities for the country including for the pre- 2020 mitigation period. The technology needs Assessment for Georgia conducted under a scheme of the United Nations Framework Convention on Climate Change also identifies energy efficiency and renewable energy technologies as priorities for the mitigation efforts of Georgia.

Geothermal technologies has a great potential to reduce Georgia's greenhouse gases emissions and contribute to the diversification of energy sources.



# Domestic Climate Finance mechanisms.



Georgia has co-financed a range of climate-related projects using its own domestic resources. Georgia has established mechanisms and policy frameworks to promote the mobilization of domestic public and private climate finance sources. These include:

- ▶ national funds that can be used to allocate resources to climate actions
- ▶ reforms on tariffs for electricity
- ▶ public budget allocation to low-carbon technologies and capital investments

# Capital investment by the government



- ▶ Georgia has allocated, and been planning to allocate, state budget and municipal budget resources to a range of climate-related projects in the country. The government has also estimated the investment needs, such as for the power sector and demand-side devices, in its Third National Communication to the United Nations Framework Convention on Climate Change. Such costs include those of fuel extraction and import, operating and maintenance costs of the energy sector infrastructure, and investments in new power plants, and the purchase of new demand-side devices.

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