

## Case study n°5

# The Use of Alternative Energy Resources in the Carpathian Region of Ukraine

**Country:** Ukraine

**Level:** National

**SDG Addressed:** SDG7 – Affordable and Clean Energy



### Summary

The objective of the case study is to show how international standards on Energy Efficiency have been used by the State Commission of Ukraine on Mineral Resources to conduct a preliminary analysis to promote the development of alternative, non-conventional, energy sources including thermal waters in the region of Carpathia. This directly contributes to the achievement of SDG 7.2 “By 2030, increase substantially the share of renewable energy in the global energy mix”.

### Background

The implementation and application of alternative (non-conventional) energy sources is a government priority for the Carpathian region. The legislation favors the use of alternative energy sources in the fuel-energy complex, which is legislated in: the Law of Ukraine On Alternative Energy Sources, the Program of Governmental Support of Development of Non-Conventional and Renewable Energy Sources and Small Hydro- and Thermal Power.

Alternative energy sources in this region include wind, solar radiation, biomass, soil heat (including hydrogeothermal energy), rivers. An advantage of the use of alternative energy sources is the low carbon emissions. The most favourable conditions for the use of thermal waters can be found within the flat part of the Transcarpathian region. The use of thermal waters is economically feasible for Berehove, Kosyno,

Zaluzhzhia, Terebliany deposit. The potential of water power resources has been assessed in the Zakarpattia Region. An advantage of the use of geothermal power stations is their ecological compatibility. Discharge waters are re-injected into the underground horizons that provide the region with eco-safety and a stable ecological cycle.

Development of non-conventional energy is one of the factors which guarantee national and ecological security in Ukraine. The use of alternative energy sources will: reduce dependence on the import of expensive energy carriers, provide energy independence for remote consumers of electric power, stimulate the development of production connected with microelectronics, electrical engineering, hydromechanics, special construction.

### Strategy

The national standards in energy efficiency, renewable energy and alternative fuels have been harmonized with the ISO standards (e.g ISO 50001:2014, DSTU ISO 50004:2016, DSTU ISO 50015:2016).

### Results and Impact

To develop alternative energy resources it is necessary take the following steps:

- perform zoning of the territory according to prospects and efficiency of the use of one or another type of energy and to develop the

information-analytical system for operational control and management of energy equipment;

- apply state-of-the-art wind- and solar accumulating power plants for power supply of individual consumers (decrease in energy dependence can promote reduction of prices for tourist services) and a possibility of feeding power networks;
- equip small hydroelectric power stations on the mountain rivers;
- equip hydrothermal spas and to consider a possibility of heating the houses with geothermal installation.

The conduct of additional studies on the use of water power resources in the Carpathian region is required for production of eco-friendly electric power.

## Challenges and Lessons Learned

The use of geothermal resources is complicated compared to the conventional energy sources. The cost of geothermal stations with the total capacity of 2.0 – 2.5 ths of MW fluctuates between 1.5 and 2.0 billion USD. The payback period for such a project is estimated at less than 5 years. Accordingly, the use of geothermal energy represents a challenge on account of: (i) considerable costs for drilling of wells and re-injection of wasted water and (ii) creation of corrosion resistant heat technology.

## Potential for Replication

This experience can be used other countries, especially those that are rich in thermal waters (for example Hungary).

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**Contact Name:** Georgii Rudko  
**Organisation:** State Commission of Ukraine on Mineral Resources