Green Energy Frontiers

Bridging Geoscience with Energy professionals

GEOALLIANCE LEARNING MATERIALS

Alena Finogenova [1] , Juri Muzi [1], Vita Kalashnikova[1]

[1] PSS-GEO, Norway

ABSTRACT

Alena Finogenova [1] , Juri Muzi [1], Vita Kalashnikova[1]

The GeoAlliance learning materials, developed as part of the grant work, serve as a valuable resource for both students and professionals engaged in geothermal exploration. These materials provide a comprehensive understanding of geothermal energy, combining theoretical knowledge with practical applications to enhance exploration efficiency. By offering a structured approach to geothermal resource identification, they aim to support informed decision-making in both academic and industry settings.

The work systematically presents key aspects of geothermal exploration, covering fundamental topics such as an introduction to geothermal energy, the challenges associated with exploration, and innovative, efficient solutions. Additionally, it delves into the economic aspects of geothermal projects, their potential role in city energy supply, and the legal considerations that impact project implementation. Through synthetic studies and real-world data applications, the materials highlight best practices and methodologies to improve exploration success rates while reducing financial and technical uncertainties.

One of the significant conclusions drawn from this work is that EU continental geothermal resources still rely heavily on subsidies. A transition toward more data-driven exploration strategies has the potential to reduce financial dependency by improving resource identification and development efficiency. The presented techniques—including well log data analysis, seismic investigations, and electromagnetic surveys—demonstrate their feasibility and effectiveness in optimizing exploration outcomes.

Furthermore, real-world case studies from Romania illustrate how these advanced methodologies can be applied in practice. They address challenges specific to low-enthalpy reservoirs and showcase strategies for optimizing resource utilization. The findings provide a solid foundation for future research and industry application, aiming to drive further advancements in geothermal development across Europe and promote sustainable energy solutions.

Acknowledgments

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