



Analysis of socio-economic footprint for hybrid pumped hydropower storage of excess energy in open-pit coal mines

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The transformation of coal regions into sustainable energy landscapes is a strategic aspect of the European Union's initiatives. This article is dedicated to the socio-economic impact of establishing hybrid pumped hydro storage (HPHS) systems in transitioning open-pit coal mines. The solutions analyzed are part of the ATLANTIS project, which aims to utilize the unique regional benefits these areas offer for HPHS implementation.

These coal regions, currently undergoing transformation, present distinct advantages for HPHS system deployment. Their existing infrastructure, coupled with the potential for integration with renewable energy sources, makes them ideal sites for sustainable energy projects. The ATLANTIS project enables the identification and assessment of these attributes to maximize both economic and socio-economic benefits, enhancing the value of these regions beyond their traditional mining roles.

A crucial element of this research is the quantification of the enhanced socio-economic footprint resulting from the HPHS system implementation. This includes a detailed analysis of how repurposing former coal mines into energy storage facilities can lead to broader economic revitalization and socio-economic development. The study examines the potential for job creation, stimulation of local economies, and overall improvement in community well-being.

By utilizing a comprehensive approach that incorporates regional economic, demographic, and market data, this article offers a holistic view of the socio-economic benefits of HPHS systems. It aims to provide valuable insights to policymakers, energy sector stakeholders, and affected communities, underscoring the potential of repurposed mining landscapes in the transition towards a more sustainable energy future.

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