

Increasing System Flexibility through a Combination of Pumped-Hydro and Battery-Storage Systems. An Overview of Possible Developments

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Abstract

The task of CO₂ neutrality in 2050 with high targets for 2030 ask for a large deployment of Renewable Energy Sources. However, the volatility of RES asks also for a high flexibility in the system, to be provided with a high share of storage resources. Traditional Pumped Hydro Powerplants (PHP) and newer Battery Energy Storage Systems (BESS) are competing technologies which need to co-participate to this effort. The paper is analyzing a combination of these resources, with the purpose to be able to cover the need of flexibility, by giving also a preliminary view for Republic of Moldova. The analysis is using the strengths of each technology, and investigates appropriate business models and opportunities for BESS, to highlight that they have many opportunities to be exploited in a future high-RES scenario. It is shown that these options are able to have a complementarity which brings synergies and provide meaningful solutions for the high need of storage in an decarbonized energy paradigm.

Keywords: photovoltaic systems, renewable energy sources, Low-carbon economy, batteries, energy storage, fuel cells, renewable energy sources, solar energy, wind energy

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