PRESS RELEASE

Launch of the STOR-HY project, which aims to reduce the capital and operating costs of innovative pumped storage projects

STOR-HY will improve the lifetime and recyclability of components and develop operational strategies for unconventional schemes.

Funded by the HORIZON programme under Grant Agreement No. 101172905, STOR-HY will run for 48 months from 1 October 2024. The project has received 7.9M€ in funding and involves 18 partners from 8 countries, coordinated by the Universitat Politècnica de Catalunya (UPC).

Brussels, November 2024 — On the 15-16 of October 2024, STOR-HY was officially launched in Brussels, Belgium, to reduce the capital and operating expenditures of innovative pumped storage projects by increasing the lifetime and recyclability of pumped storage plant (PSP) components. It also aims to increase the operational capacity of PSPs by adapting them to unconventional storage schemes and harsh fluids in order to increase their geographical availability.

ABOUT THE PROJECT

Pumped storage hydropower (PSH) is one of the most efficient and flexible large-scale energy storage options available today, with up to 80% full-cycle energy recovery and the ability to balance the grid and expand utilities' renewable energy portfolios. PSH accounts for around 96% of global utility-scale energy storage. The storage capacity of European hydropower reservoirs exceeds 185 TWh, making them the largest "batteries" available to store energy from other renewables. Europe's PSH represents 20% of the world's hydropower capacity.

As a source of bulk power positions, hydropower is a key contributor to grid stability. However, the surge in unpredictable renewable energy sources requires increased regulation to balance intermittent generation, including energy shifting through storage. This intensified demand places a strain on the mechanical components used to regulate power, as they must withstand an increased number of start-stop cycles, ramping duties, and rapid transitions from energy generation to storage.

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This can result in increased operating costs, accelerated deterioration, and unexpected damage to critical PSP equipment. To mitigate these issues, there is a crucial need for accurate degradation models and advanced control methods that not only maintain the mechanical integrity of aging hydropower infrastructure, but also actively reduce wear and tear on sensitive components.

STOR-HY seeks to address these challenges by improving the lifetime and recyclability of components and equipment and by defining operating strategies for unconventional schemes through sensor-based, wear and tear monitoring systems to detect early failure mechanisms, postpone unnecessary maintenance actions, avoid unplanned outages, and limit planned outages. Using digital tools for strategic and operational management, it intends to improve the efficiency, reliability, and availability of PSPs, taking into account energy and market demand and dynamics, variable renewable generation, and integration, while mitigating the effects of climate change and improving the flexibility and resilience of the EU energy grid.

STOR-HY also focuses on building regional links with local stakeholders, industry, academia, and policy institutions. Sustainability considerations include economic, environmental, circular economy, and social aspects, drawing on lessons learned from previous projects, including include local impacts, societal acceptance, ecological concerns, and life cycle costing.

To achieve these ambitious goals over the next four years, UPC will work with an international consortium of academic institutions, research centres, and companies from 8 countries: Spain (Universitat Politècnica de Catalunya, Sener Mobility, Hulleras del Norte – HUNOSA, Fundación Asturiana de Diversificación Minera – FAEN), France (GE Hydro France, Électricité de France – EDF, Kaizen Solutions, Institut polytechnique de Grenoble), Portugal (EDP-Energias de Portugal, EDP NEW – EDPN, Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência – INESCTEC), Switzerland (Alstom Renewable, Haute école specialisée de Suisse occidentale, ANDRITZ Hydro), Germany (vgbe energy), the Netherlands (Universiteit Twente), Norway (Norwegian Research Centre – NORCE), and Belgium (Zabala Innovation).

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