



SHERPA

PRESS RELEASE

SHERPA – new Solutions for Hydropower plants to Enhance operational Range, Performance and improve environmental impAct



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SHERPA, New Horizon Europe-Funded Project Kicks Off in Brussels

Brussels, September 2024 – The SHERPA project (Solutions for Hydropower plants to Enhance operational Range, Performance, and improve environmental impAct), funded by the European Commission under the Horizon Europe Program, officially kicked off this month. The project, which will run for 42 months, brings together a consortium of seven key partners across Europe to develop innovative solutions that will significantly improve the performance and sustainability of hydropower plants (HPPs).

The project's launch took place at a kick-off meeting held at the Basque Delegation in Brussels. The event was opened by Marta Marin, Basque Delegate to the European Union, followed by a project overview presented by the coordinator from Iberdrola. Each partner organization had the opportunity to outline their respective work packages, and Clara Astudillo, the European Commission's Project Officer, provided guidance on compliance and reporting requirements.

The SHERPA consortium includes partners from four EU countries: Iberdrola Generación S.A. (project coordinator), Asociación de Investigación Metalúrgica del Noroeste, Voith Hydro Holding GmbH & Co, EPRI Europe DAC, Innometrics SL, Aecom Inocsa S.L., and Zabala Innovation.

The hydropower sector, SHERPA project and its objectives

Hydropower is a crucial renewable energy source, recognized for its environmental benefits and substantial contribution to global energy demands. However, hydraulic turbines face operational challenges due to fluctuating energy market demands and the increasing need for operational flexibility. Turbines often operate outside their optimal flow range, leading to inefficiencies, instability, and increased wear on components.

A key issue is the **environmental flow (E-flows) regulations** imposed on many HPPs, which often force turbines to operate under off-design conditions. This can lead to significant damage to critical components, higher maintenance costs, and reduced operational lifespan. SHERPA aims to address these challenges by **developing and validating a range of innovative technologies designed to refurbish existing hydropower plants and improve their efficiency and environmental performance.**

The key objectives and technological innovations of the project are the following:

- **Advanced Materials and Coatings:** Application of additive manufacturing (AM) metallic patches and coatings to minimize damage and enhance resistance to cavitation.
- **Adaptive Rotational Speed:** New strategies to adjust turbine speed based on varying water flow rates.
- **Air Injection Systems:** Development of systems to improve water quality and operational efficiency.
- **New Runner Designs:** Design of new turbine runners tailored to perform better under E-flow conditions.

The project will also leverage advanced modelling, simulation, and monitoring tools to assess the impact of these solutions on energy output, cost-effectiveness, flexible operation, and biodiversity. SHERPA's goal is to extend the operational range of hydropower plants to lower flows without compromising their economic viability, longevity, or environmental and social impact.

SHERPA will tackle 10 key technological challenges across four main areas:

1. **Mechanical solutions** to improve performance and reduce damage at low water flows.
2. **Electrical solutions** for optimizing performance and reducing damage under fluctuating conditions.
3. Measures to enhance **water quality and protect biodiversity**.
4. **Advanced tools** for modelling, performance monitoring, and predicting the remaining useful life of turbine components.

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