



# Hydroelectricity: a key enabler for grid flexibility

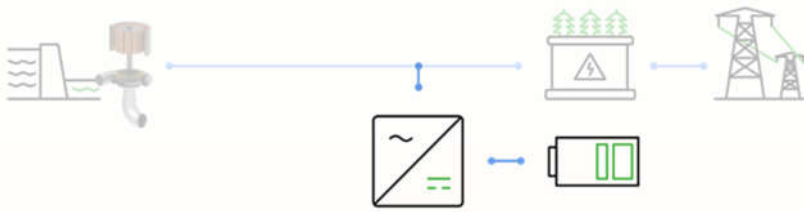
Turbine Extended Operating Range Solution

## CONTEXT

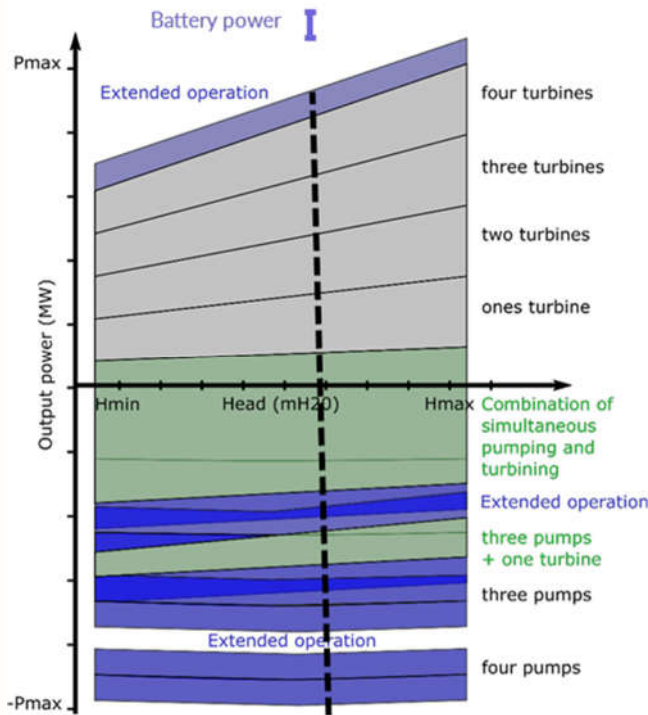
Electricity producers are paid for power they can provide to control the electrical grid. The operating range of most of the hydropower plants contains dead bands where operation is not allowed, either because of machine restrictions or impossible combinations between generation units.

Existing technologies to limit the dead bands such as hydraulic short-circuit or upgrade in variable speed are costly and required an outage of several months.

## PRINCIPLE



The proposed patented solution is an add-on connected to your asset, composed of an optimised energy storage system, a DC/AC converter with its control system. This cost-effective solution makes it possible to fill these dead bands.



Blue areas = extended possible operating ranges

## APPLICATION DOMAIN

- Hydropower production
- Applicable to PSP, Francis and Kaplan turbines
- Applicable to new and refurbishment projects

## YOUR BENEFITS

- Increase of revenues with fast pay-back thanks to added performances at low cost
- Limit the production outage to implement the solution on existing asset

## OUR OFFER

- Feasibility & design studies
- Testing & validation using our real-time simulation hydraulic platform (HydroPHIL)
- Support technology implementation on your asset
- Transfer of technology

## OUR REFERENCES

**LOLABAT** Test of Ni-Zn battery hybridizing a hydropower plant on our real-time testing facilities.

Horizon 2020 programme under grant agreement No 963576

**CNR** Techno-economical study of hybridizing hydro turbine with battery to allow a 0-100% power range of variation.

## CONTACT US

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October 2022