



# Hydroelectricity: a key enabler for grid flexibility

Fast ramp-up time solution to provide flexibility and ancillary services

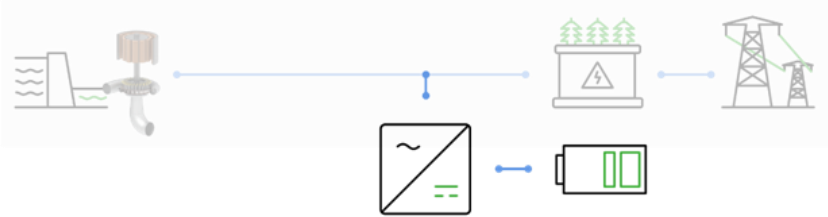
## CONTEXT

Electricity producers are paid for power they can provide to control the electrical grid. Existing hydropower plants are not designed to provide fast electric power generation response.

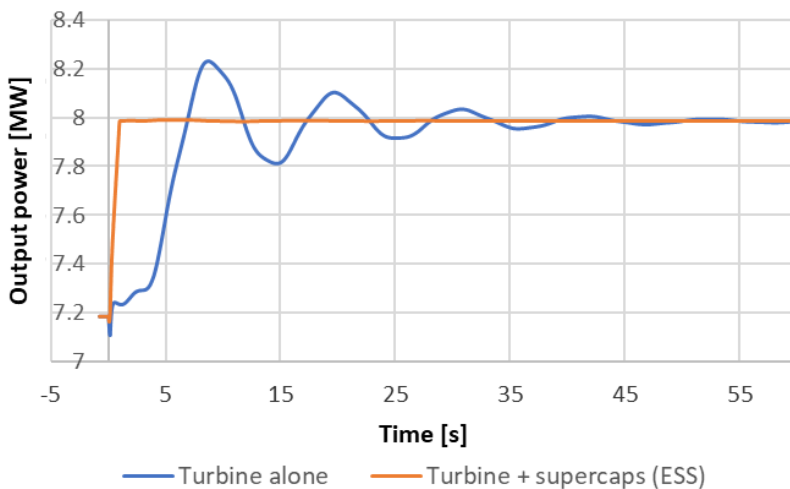
The massive integration of fatal renewable energies will induce instabilities and, thus, jeopardize the supply of electricity. As the main energy storage installed capacity, hydro technologies will therefore have to evolve to meet the new requirement of very fast frequency response ancillary services.

Existing technologies (hydro variable speed turbine) are costly (new turbine and generator, civil work...) and require a long outage.

## PRINCIPLE



The proposed patented solution is an add-on connected to your asset, composed of an optimised energy storage system, and a DC/AC converter with its control system. This cost-effective solution makes it possible to provide hydroelectric power within a second as shown below.



## APPLICATION DOMAIN

- Hydropower production to contribute to Fast Frequency Response market
- Applicable to PSP, Francis and Kaplan turbines
- Applicable to new and refurbishment

## YOUR BENEFITS

- Increase the revenues of your asset 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

Internal validation on our HydroPHIL real-time tests rig in our Grenoble facilities.

**Meridiam** for people and the planet Specification and profitability evaluation of a pump storage power plant for an islanded electric grid including our fast ramp-up technology .

## CONTACT US

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