STOR-HY

Innovative Storage Technology and Operations in Hydropower

Webinar “Boosting Hydropower: Best Practices for Research” with SHERPA, RevHydro, and STOR-HY

6th December 2024

ETIP HYDROPOWER

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Overview of STOR-HY

- The call Horizon CL5-2024-D03-01-16
- The consortium of STOR-HY
- Targeted outcomes of STOR-HY
- Technical/scientific results for STOR-HY
- STOR-HY strategy
- The demonstrators
- Summary

The call HORIZON-CL5-2024-D3-01-16

KEYWORDS OF THE CALL

- Increased **availability** of PSH
- **Reduced OPEX and CAPEX**
- Improved **efficiency** of PSP operation
- Competitiveness of **European hydropower** industry
- **Sustainability** of the innovative technologies (circular economy, social and environmental aspects)

Innovative PSP equipment and tools

Innovative storage management systems

DOMAIN OF APPLICATION

Unconventional schemes; **low head**; **harsh operating fluids** (salt water); abandoned **coal mines**

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Consortium

21 organizations:

- 7 from Spain
- 4 from France
- 3 from Portugal
- 1 from Germany
- 1 from the Netherlands
- 1 from Belgium

Associated countries:

- 3 from Switzerland
- 1 from Norway

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Universities and RDI centers (8)

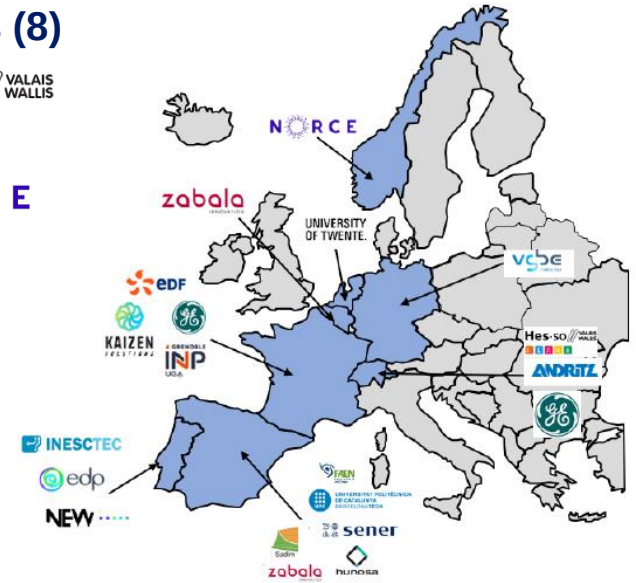
NEW, FAEN Fundación Asturiana de la Energía, Hes·so Valais Wallis, INESCTEC, Grenoble INP UGA, NORCE, Universitat Politècnica de Catalunya BarcelonaTech, University of Twente.

Utilities (3)

EDF, edp, hunosa

Manufacturers (3)

ANDRITZ Hydro, GE



Industrial developers (4)

KAIZEN SOLUTIONS, SADIM, sener

Exploitation and dissem. (3)

VGBE ENERGY IS US, zabala INNOVATION

Targeted outcomes for STOR-HY

Start point: To understand the tecno-economic, regulatory, environmental and social **requirements for new PSP equipment and tools** (WP2)

Outcomes of STOR-HY will target

1. CAPEX and OPEX **reduction** of existing PSP
2. Increasing operational capacities of PSP: Adaptation to **harsh conditions** to increase the **geographical availability**
3. Improve **digital operational tools** for greater efficiency
4. Boost **durability and recyclability** of components
5. **Replicability** and scalability of the developed technologies

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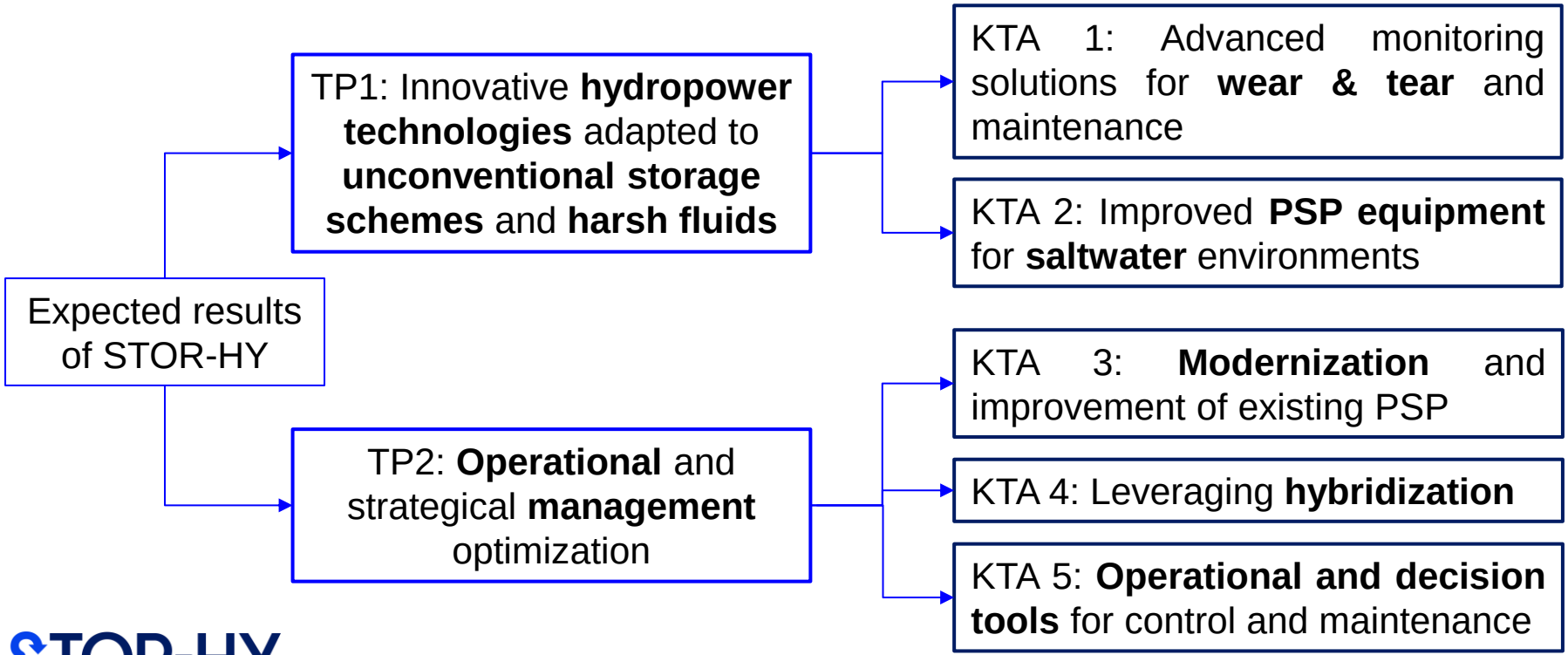
Technical results of STOR-HY

Innovative pumped storage equipment and tools + storage management systems



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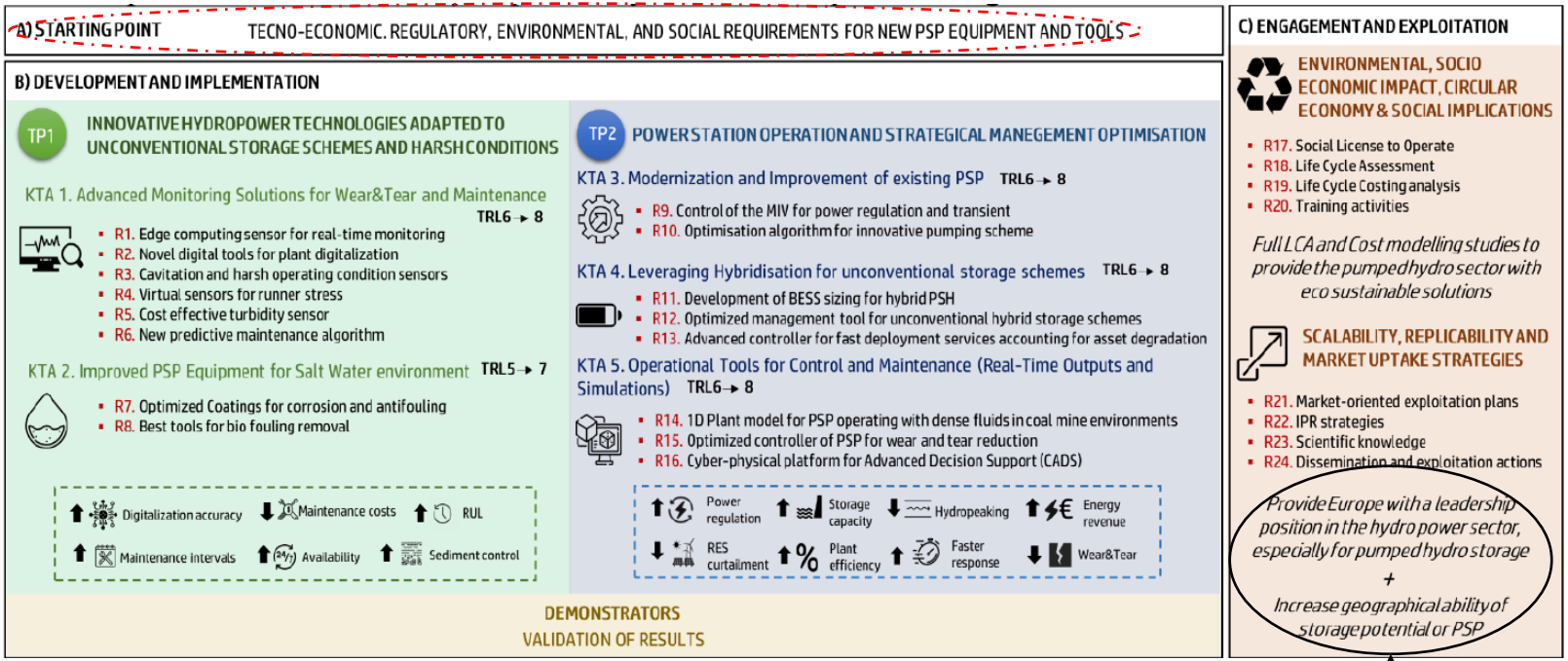
Technical results of STOR-HY



16 main results in **2 technological pillars** and **5 key technological areas**
8 main results for engagement and exploitation

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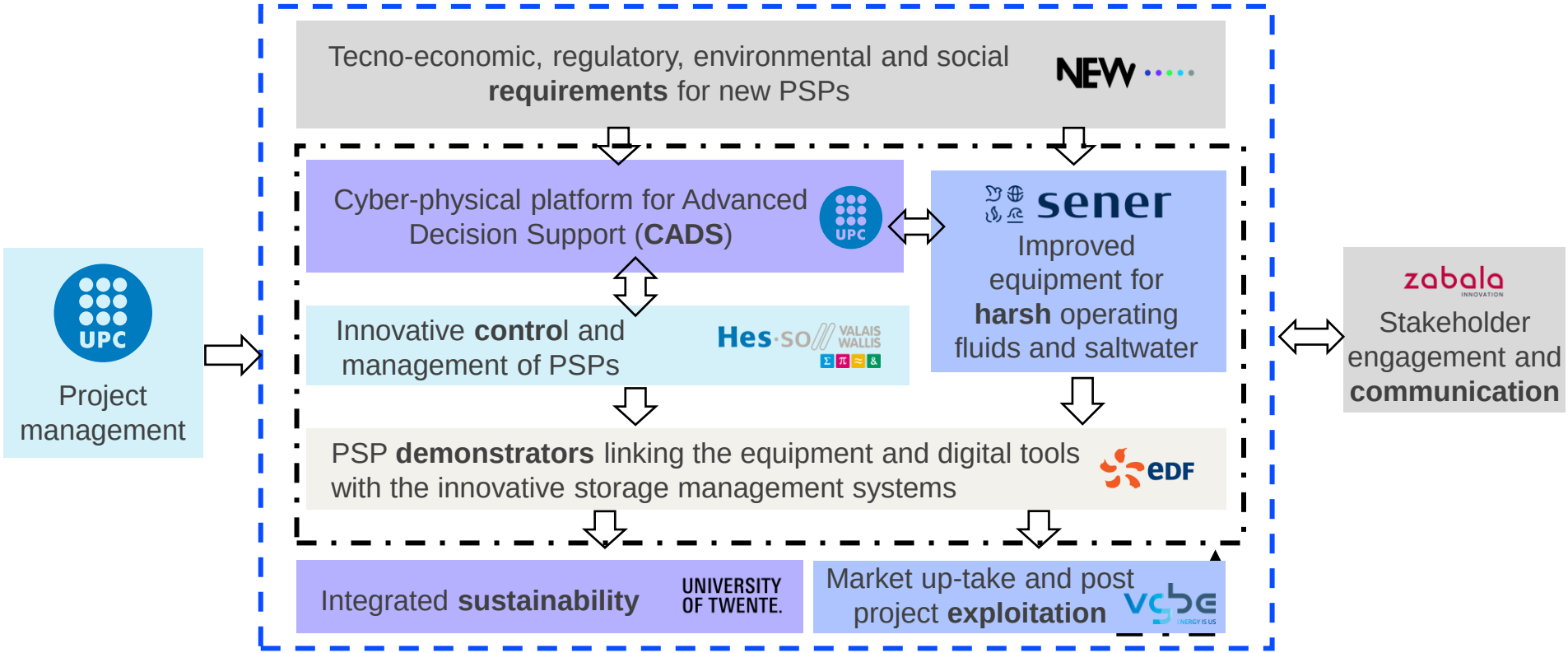
STOR-HY strategy



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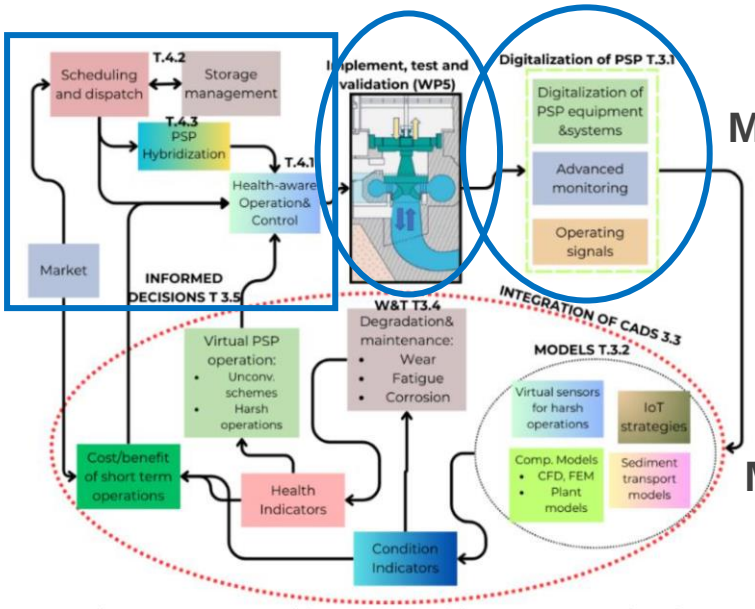
STOR-HY strategy

Demonstrators

Health aware operation and control



Monitoring

Modeling and analytics with CADS

CADS will aim to support decisions of the storage management and health-aware operations in PSPs.

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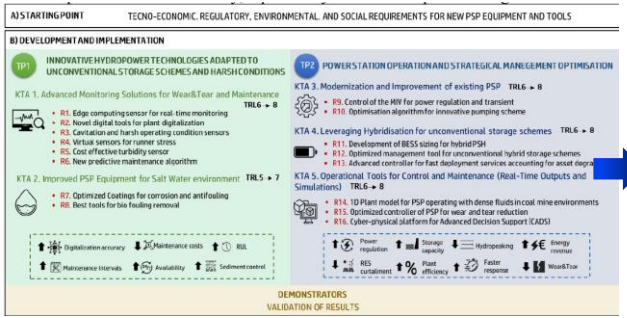
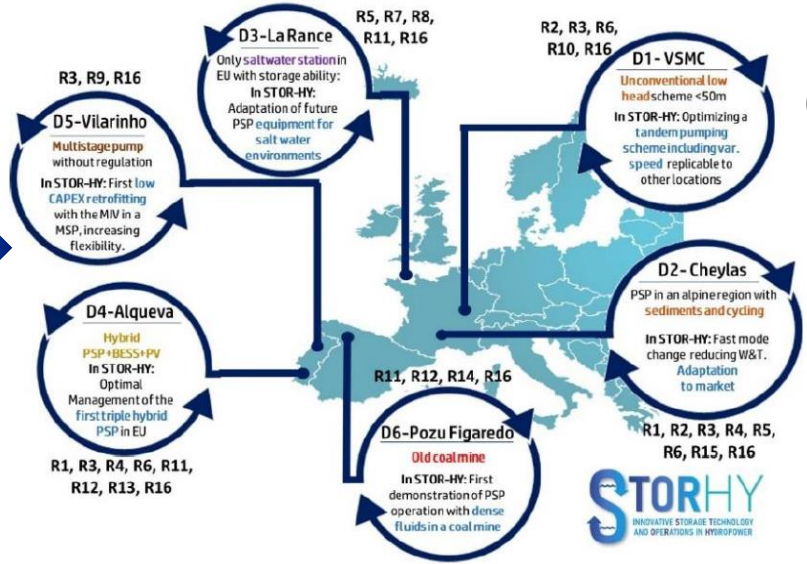
STOR-HY demonstrators

Developments will be implemented at a **TRL 7/8 level with replicability of results**





6 demonstrator sites PSH:

- 3 in France (EDF)
- 2 in Portugal (EDP)
- 1 in Spain (HUNOSA)

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STOR-HY demonstrators

Unconventional storage schemes and/or **harsh operating fluids**

#1 VSMC

Optimal tandem pumping with var speed

H = 25 m
P = 16 MW

#2 Cheylas

Fast mode change with sediments, reducing W&T, adaptation to market

H = 250 m
P = 250 MW

#3 La Rance

Adaptation of PSP equipment for salt water

H < 7 m
P = 10 MW

EDF

#4 Alqueva

Optimal management of triple hybrid PSP

H = 75 m
P = 130 MW

#5 Vilarinho

Low CAPEX retrofitting, MIV in MSP

H = 425 m
P = 75 MW

edp

#6 Pozu Figaredo

PSP operation with dense fluids in a coal mine

H = 40 m
P = 100 kW

hunosa

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Wrapping up

- STOR-HY is a new Horizon project about innovative storage technologies and operation in Hydropower (2024-2028)
- The consortium includes 21 organizations from 8 countries: universities and RDI, manufacturers, utilities, industrial developers and communication and exploitation experts
- Main targeted outcomes are:
  - Reduction of CAPEX and OPEX of exiting PSPs
  - Boost durability and recyclability of components
  - Improvement of digital tools for better operations and greater efficiency
  - Increasing operational capacities of PSPs
- Developments will be tested in the demonstrators in harsh conditions and unconventional/innovative schemes (TRL 7/8)

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THANK YOU!

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