Intelligent Asset Management Platform for Hydropower (iAMP-Hydro)

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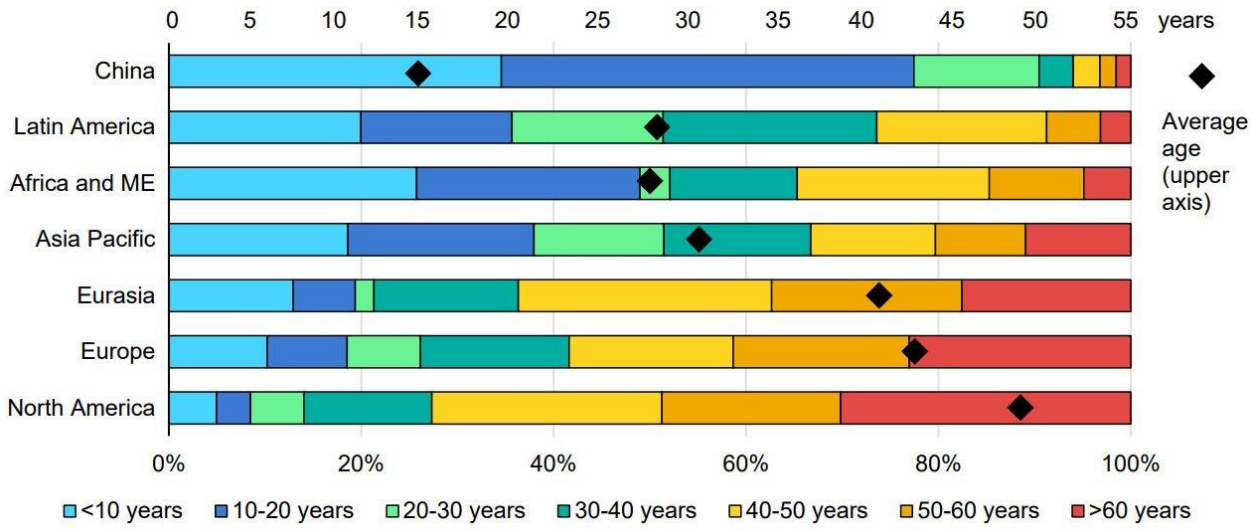
Introduction

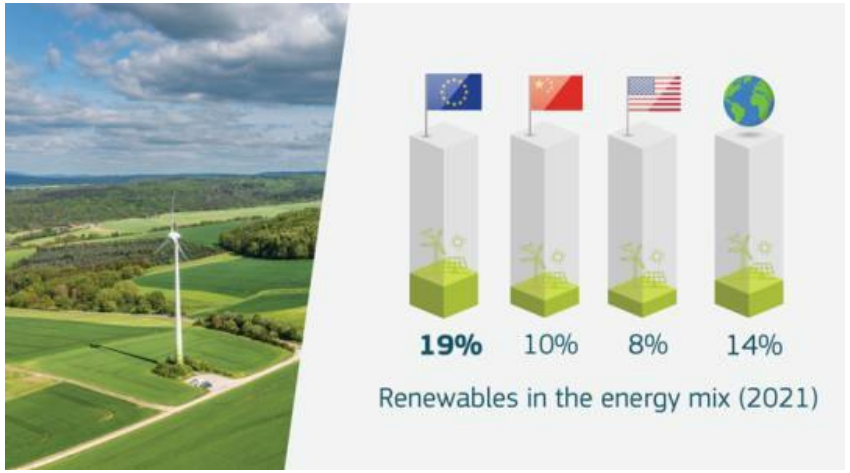
Hydropower & Digitalisation

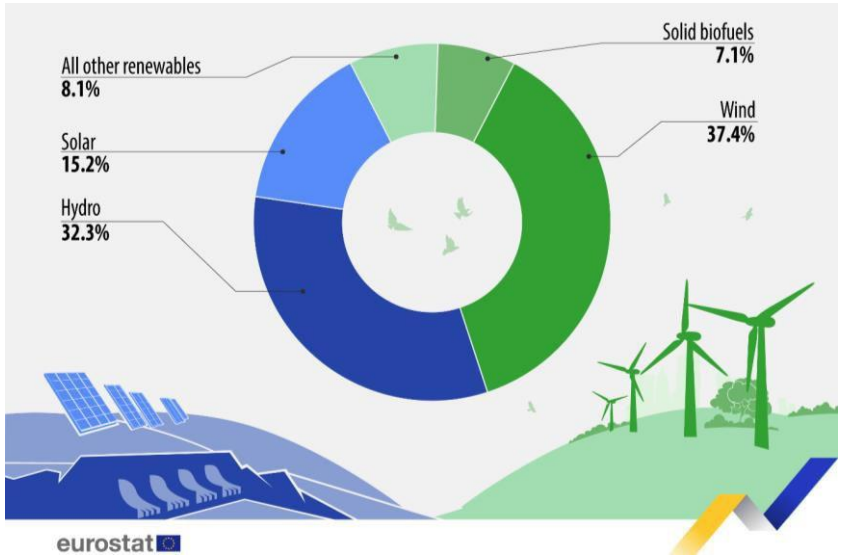
- Hydropower represents one sixth of global electricity generation
- Provides significant contribution to grid flexibility and security
- However, the fleet is aged and requires significant modernisation works



Age profile of installed hydropower capacity, 2020

(Source: Hydropower Special Market Reports, International Energy Agency)



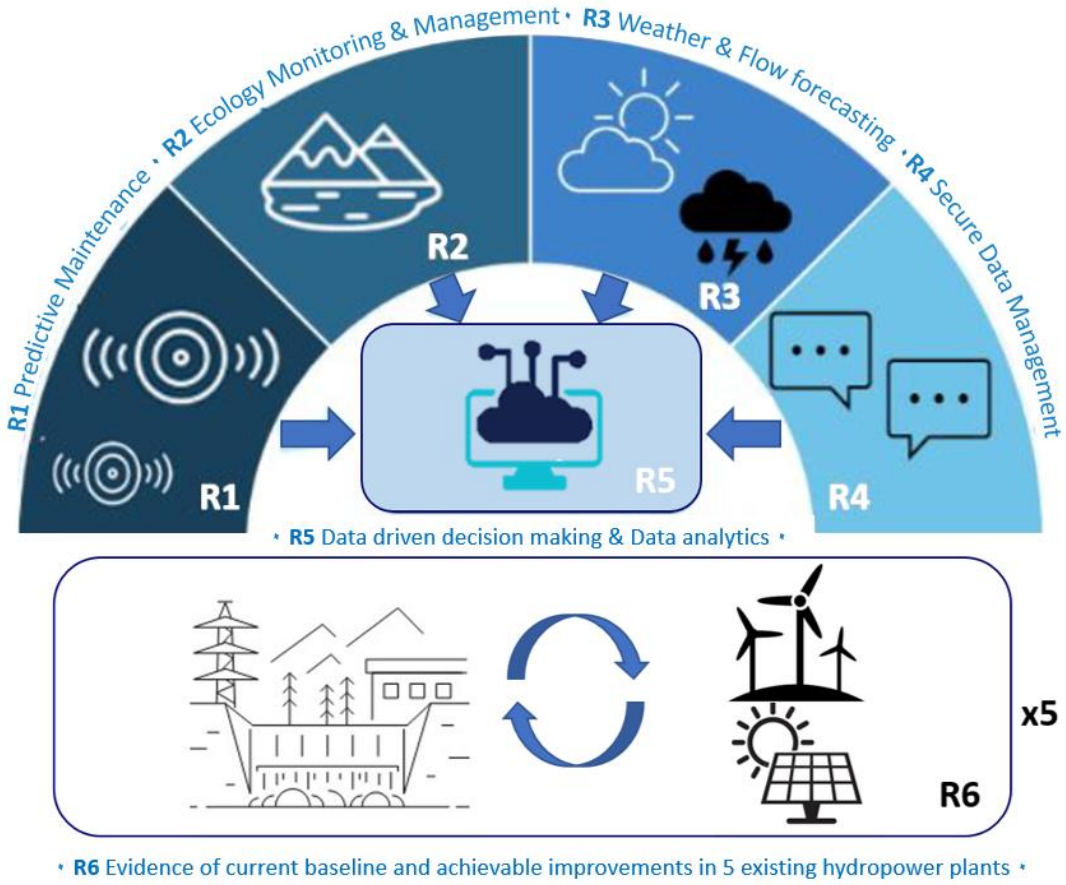


Sources of renewable energy in gross electricity consumption, EU 2021

Project Objectives

1. Co-develop and validate digital solutions for condition monitoring of hydromechanical equipment.
2. Co-develop and validate advanced sensors/models for biodiversity monitoring.
3. Co-develop and validate enhanced weather & flow forecasting models for improvement in reservoir inflow, outflow, and water balance prediction.
4. Co-develop a secure protocols for data collection, communication, storage, sharing, and interoperability with other renewables.
5. Develop iAMP decision-making algorithms for flexible and market-oriented hydropower operation
6. Dissemination and exploitation of results to maximise impacts.

intelligent Asset Management Platform



Methodology

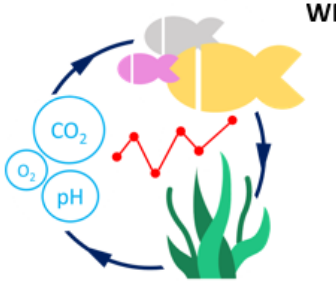
Digital Solutions

Advancing the Scientific Basis, technology base & leadership

WP2-3

R1. Condition Monitoring & Predictive Maintenance

WP4-5



R2. Ecological Status Monitoring & Management

WP6-7

R3. Weather & Flow forecasting

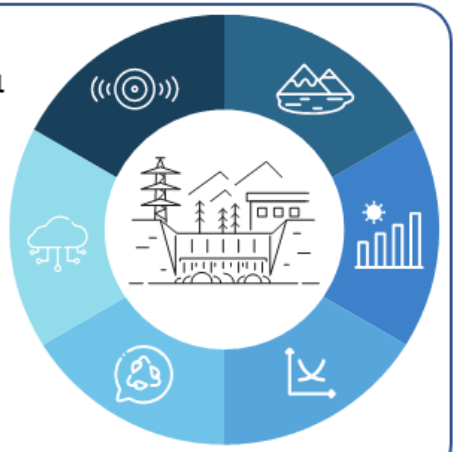
WP8

R4. Data Standards & Protocols

WP9 10 & 11

R5. Intelligent Asset Management Platform

integration



Validation

WP12

Increasing the technology competitiveness of the existing hydropower fleet

Wet & Dry Climates

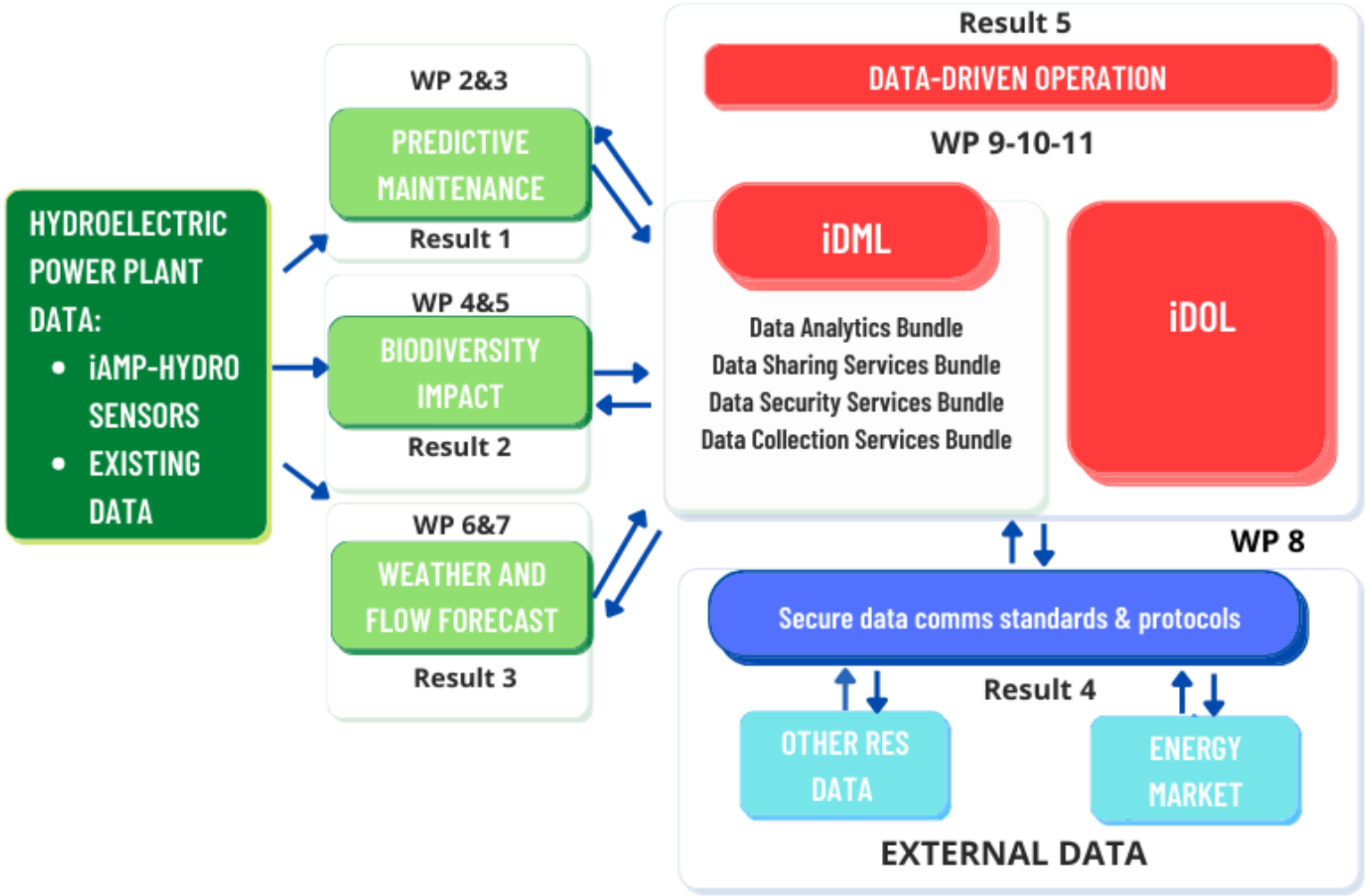
Large & Small Hydro

Multi-purpose

Differing Machine types

Differing flow regimes

iAMP-Hydro platform



Core of iAMP-Hydro

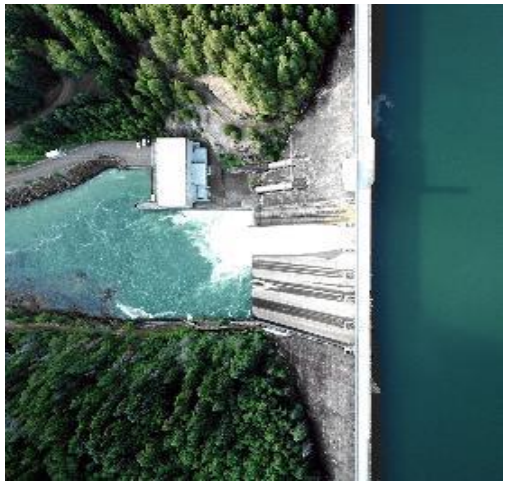
iDML - intelligent Data Management Layer

- data collection and storage
- Use of AI (machine learning and deep learning models to train data

iDOL - intelligent Data-driven Optimisation Layer

- Integration of outputs (WP 2-7), with other external data (i.e. other RES, energy markets)
- provide data-driven strategies to enhance Hydropower Operation and Maintenance.

iAMP-Hydro Validation Site



Berchules (0.8 MW)

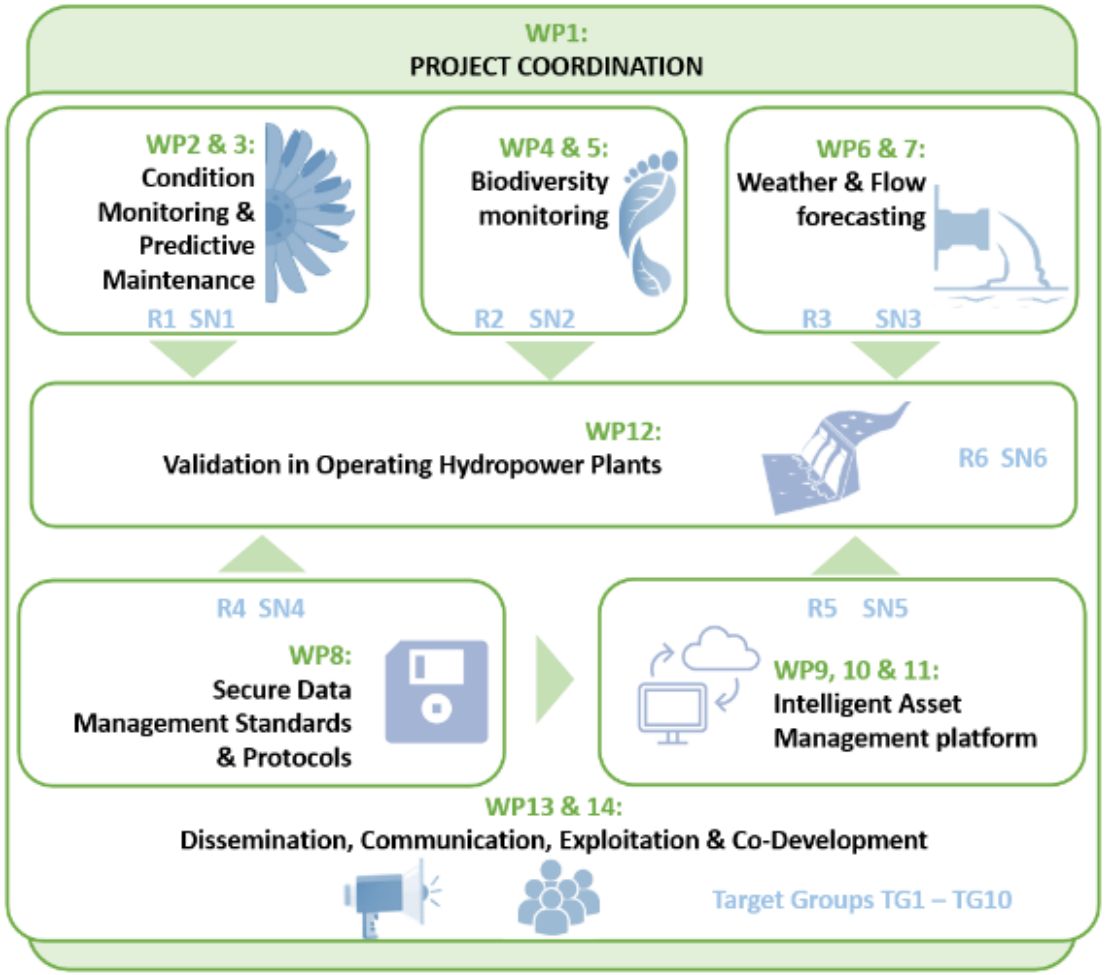
Bermejales (2.1 MW)

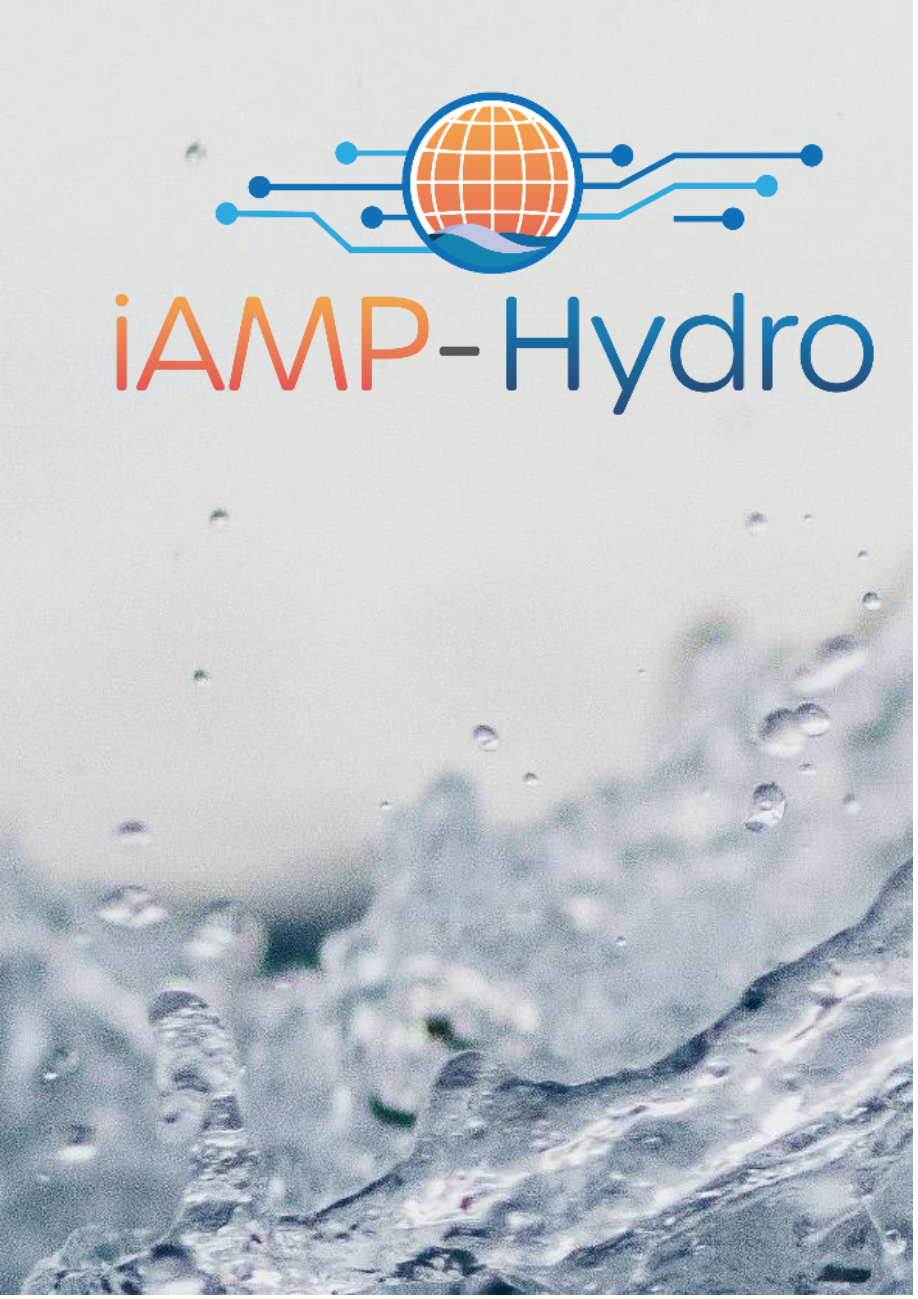
La Vega (2.4 MW)

Makrochori (10.8 MW)

Asomata (108 MW)

iAMP-Hydro Work Packages and Partnership





Thank you!

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Partners

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