



# Intelligent Asset Management Platform for Hydropower (iAMP-Hydro)

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**Trinity College Dublin**  
Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



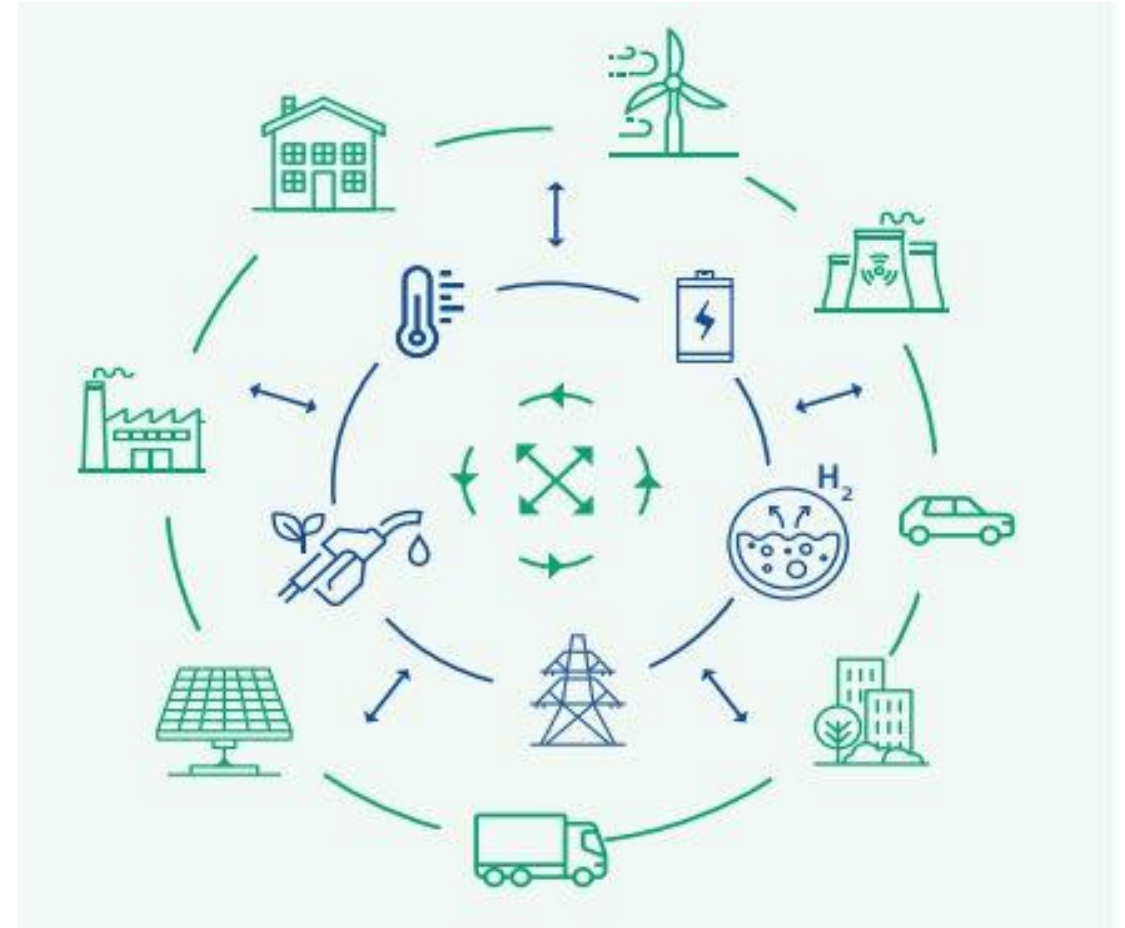
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# Introduction

## *Digitalisation of the energy system*

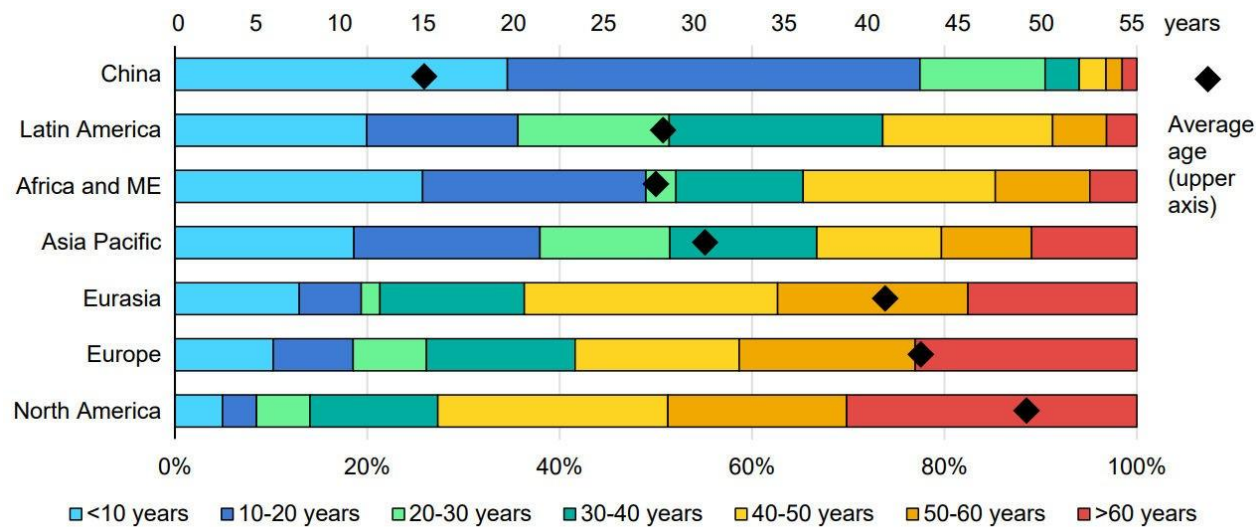
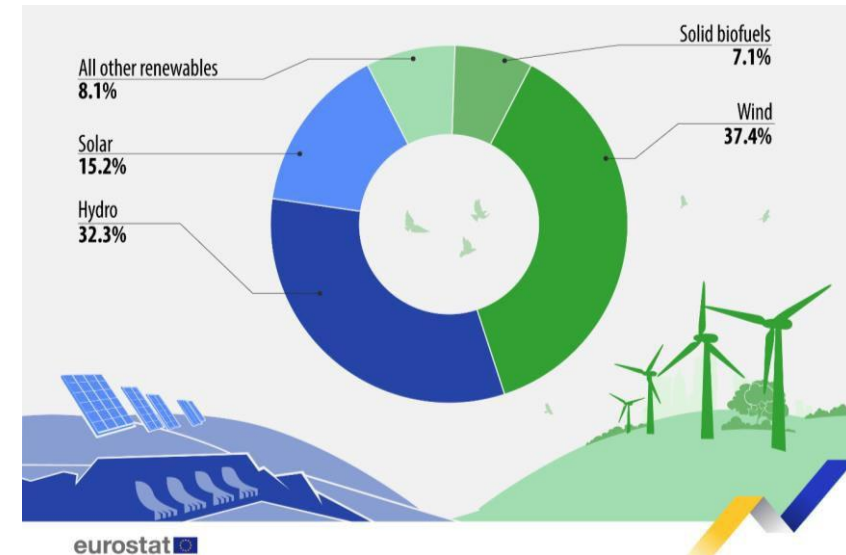
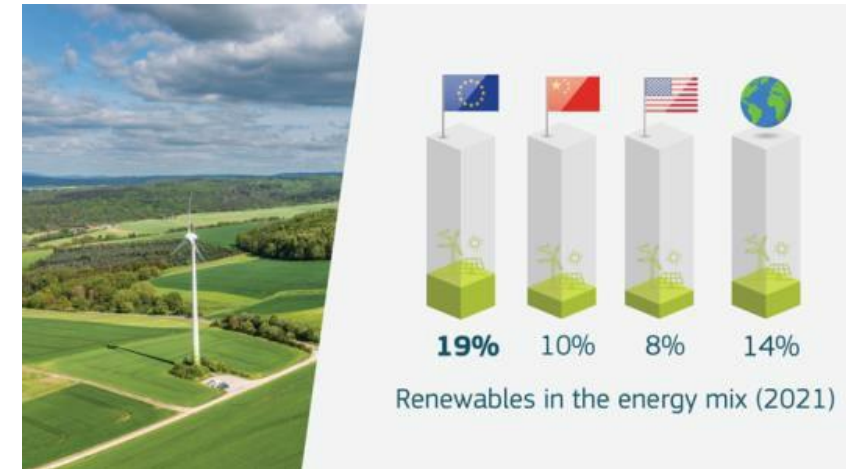
- EU electricity sector undergoing a fundamental change with the increase of digitalisation
- Digitalisation means embedding sensors, data collection and amassing big data resources for the optimisation of energy systems
- EU's digital strategy aims to achieve its target of a climate-neutral Europe by 2050
  - Investing €250 billion to boost digitalisation
  - Improving the way we use energy
  - Supporting decarbonising of energy systems
  - Infrastructure fit for the future



# 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

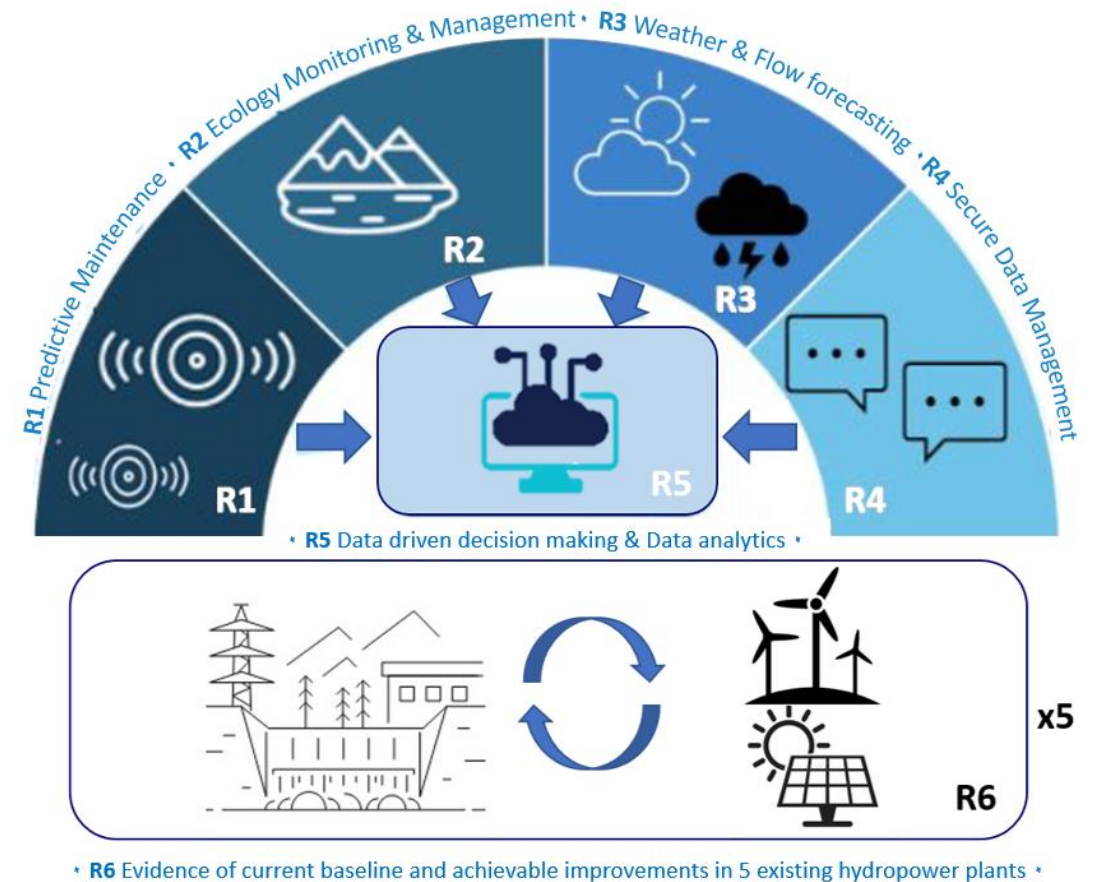
eurostat



# Project Objectives

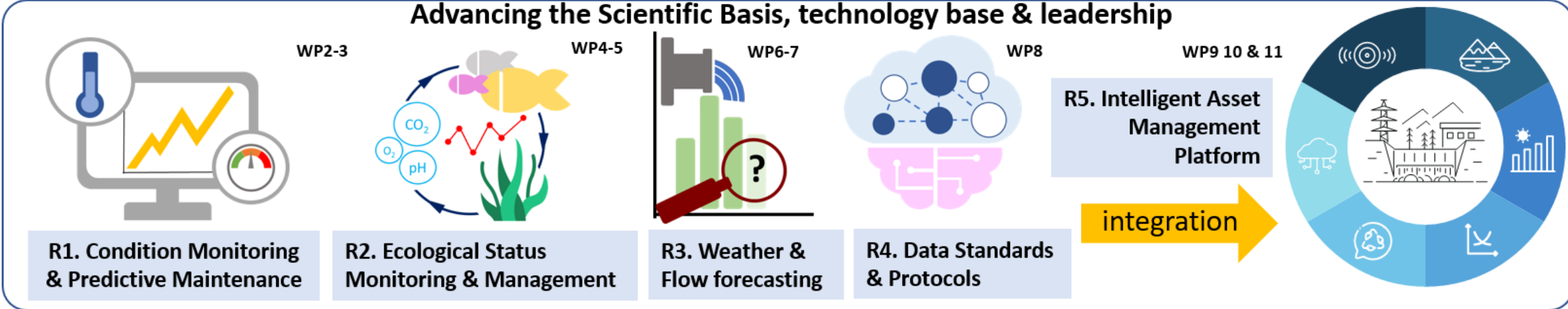
1. Co-develop and validate digital solutions for **condition monitoring** of hydromechanical equipment.
2. Co-develop and validate advanced sensors/models for **biodiversity monitoring**.
3. Co-develop and validate enhanced **weather & flow forecasting models** for improvement in reservoir inflow, outflow, 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

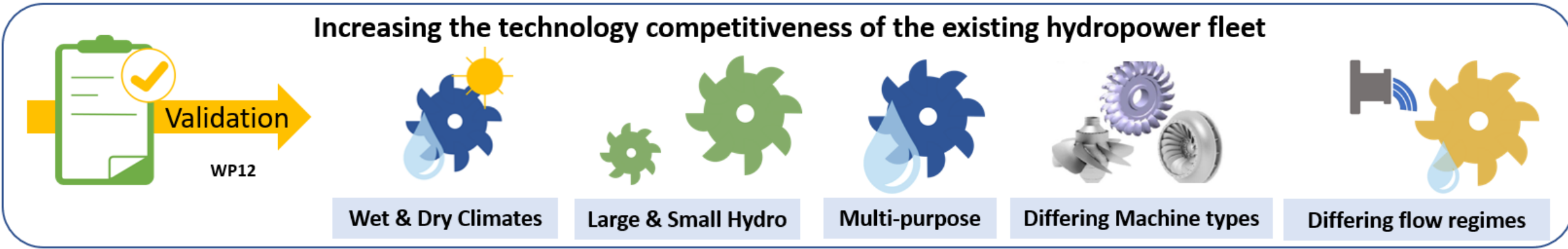


# Methodology

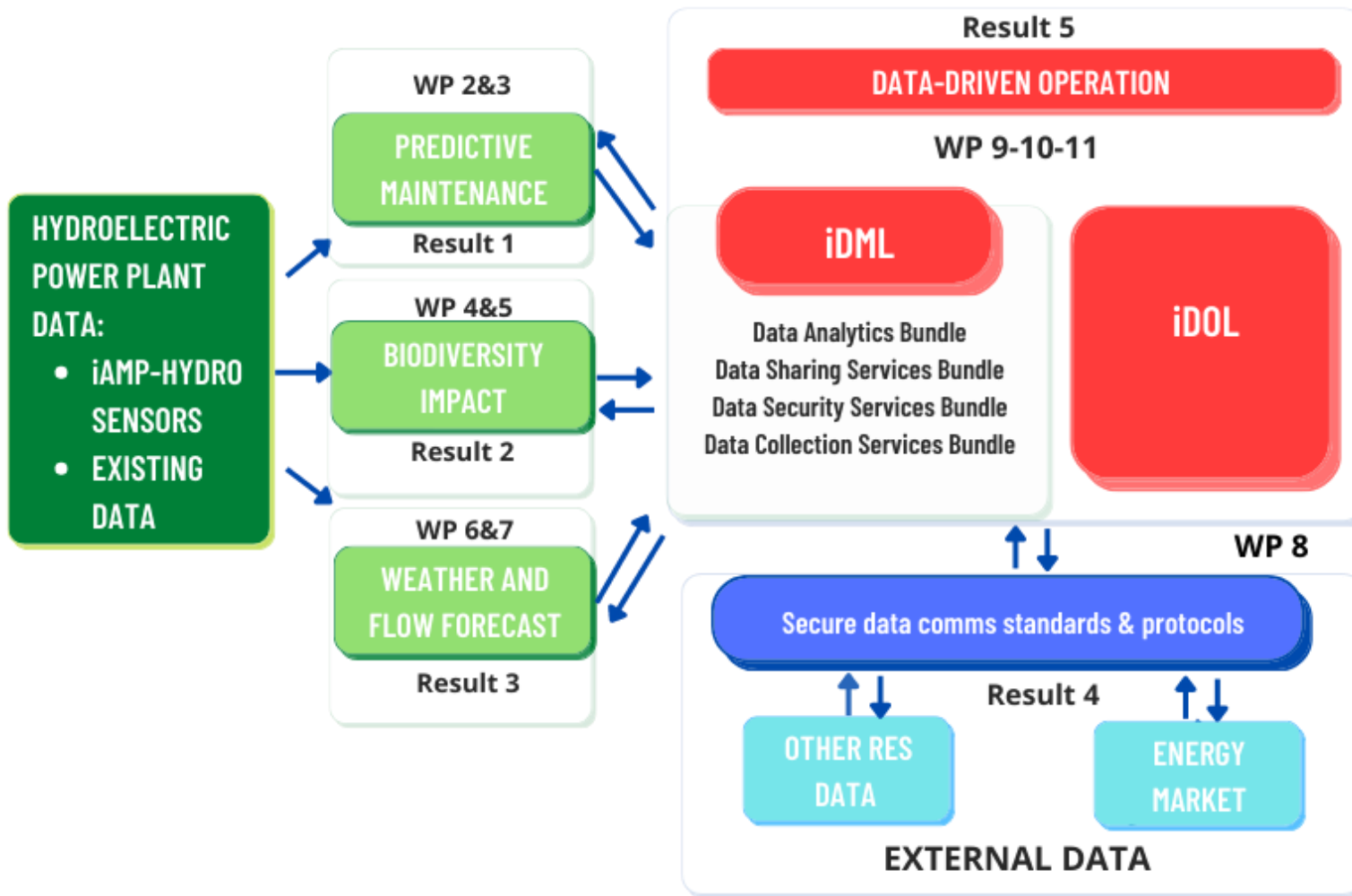
Digital Solutions



Validation



# iAMP-Hydro platform



## Core of iAMP-Hydro

### iDML - intelligent Data Management Layer

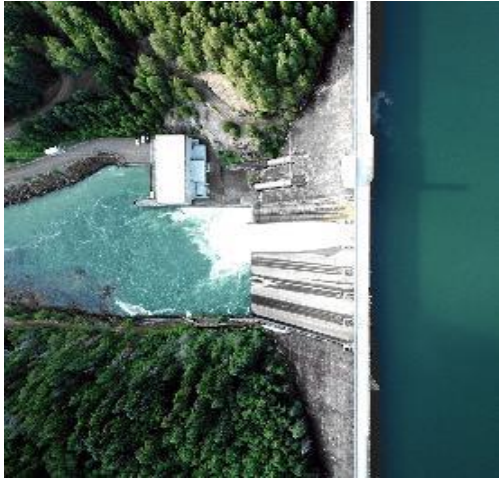
- data collection and storage
- Use of AI (machine learning and deep learning models to train data)

### 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)

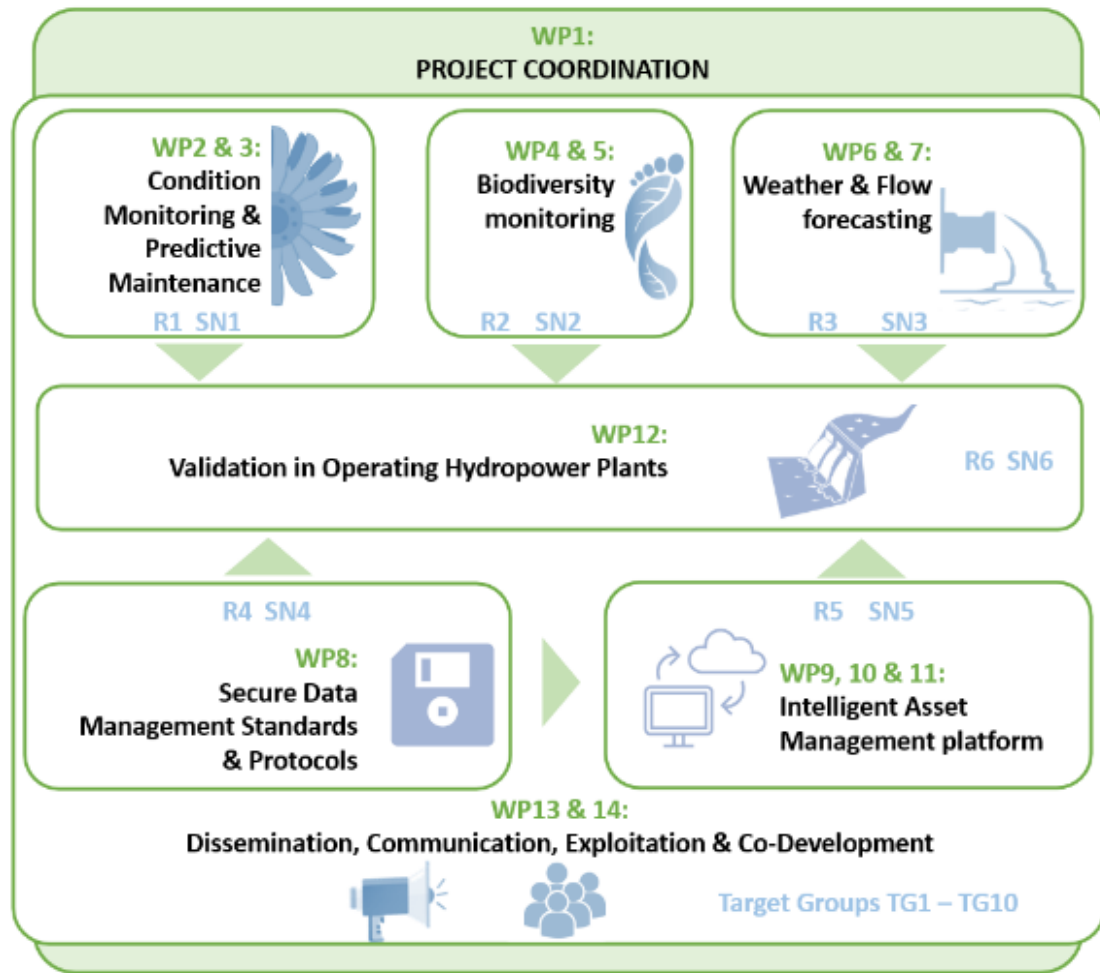


Makrochori (10.8 MW)



Asomata (108 MW)

# iAMP-Hydro Work Packages and Partnership





# Thank you!

## Contact

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## Partners

