

## KEY PARTNER

### Lead Partner / Owner:

CARTIF

### Contributing Partners:

Technical  
University  
of Munich



## OVERALL PROJECT

**EU-Programme:** Horizon 2020  
**Activity type:** Innovation Action  
**European grant:** 9.9 M €  
**Duration:** 06/2021 – 05/2026

### Coordination:

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„Enabling a secure, sustainable and conflict free  
management of water in Central Asia“

# Hydro4Planners

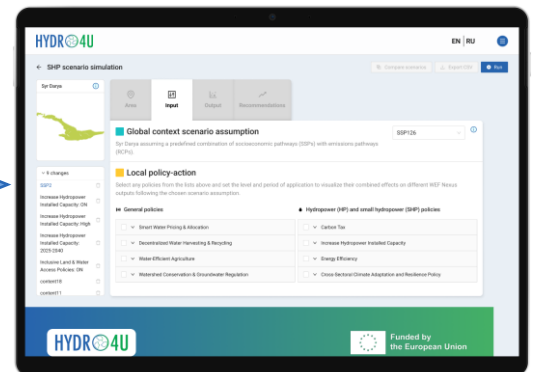
## ▶ RESULT IN A NUTSHELL

- **Hydro4Planners** tool will support **decision-making** for new small hydropower (SHP) projects in Central Asia. It is designed to aid **policymakers** and **hydropower industry** actors in identifying **viable locations and strategies** for SHP development.
- Integrates geographical and statistical data to **simulate hydropower generation scenarios** while considering Water-Food-Energy-Climate (WFEC) Nexus constraints, ensuring that new projects align with sustainable development goals and regional cooperation frameworks.

## ▶ REPLICATION TOOL CONCEPT

The user will be able to select the **area** (Aral Sea basin, Amu Darya river basin, Syr Darya river basin or sub-basins) and to **simulate** scenarios for:

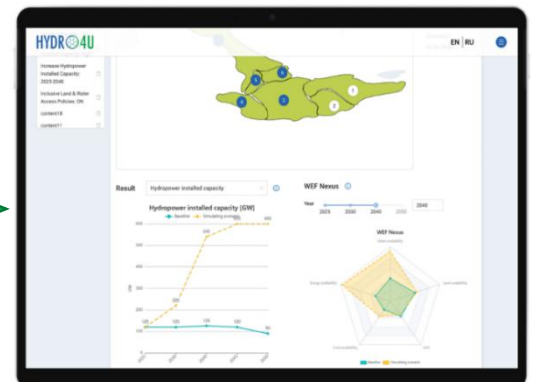
- Climate change
- Hydropower development
- Other WFE related policies



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The user will visualize the **impact** of previous decisions on **selected indicators** as:

- power generation,
- water consumption,
- GHG emissions,
- WEF security,
- etc.



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## CONTEXT

### Hydro4U overall...

... is an EU-funded project with 13 partners from 8 countries with the goal of implementing sustainable small-scale hydropower in Central Asia.  
... focusses on the modularity and pre-fabrication of hydropower plants to enable a fast and simple implementation also at remote sites.  
... will demonstrate EU quality standards and create entry points in developing markets for the European small-scale hydropower industry.

### CARTIF - Role in Hydro4U

CARTIF leads the replication activities within Hydro4U and contributes to the determination of the sustainable HP potential based on GIS data and impacts modelling at river basin scale in Central Asia.

## DETAIL ON RESULT

**Hydro4Planners** tool is designed to support decision-making for new SHP projects by identifying replication areas and feasible policies.

### Target groups

- Public authorities approving hydropower projects.
- Hydropower industry, particularly, environmental assessment consultancies.

### Key Features:

- Detailed profiling of river basins and sub-basins.
- Integrated WFEC Nexus and sustainability analysis.
- Land use mapping with water demand insights.
- Climate change impact on water resources.
- Scenario based SHP development assessment.



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The primary benefit of this tool is its ability to **enhance regional energy security and sustainability** by enabling strategic planning and implementation of SHP projects that are **both environmentally responsible and economically feasible**.

The tool offers significant advancement in **managing transboundary water resources**, mitigating conflicts, and promoting regional stability through integrated, data-driven decision-making.

## FURTHER RESEARCH POTENTIAL

**Research Potential:** Opportunities for further development highlighted in areas like improving data collection and integration, enhancing model accuracy, and expanding to new geographic regions.

**Continued Innovation:** Encourages ongoing innovation in small-scale hydropower technology and system integration.

## ► BENEFITS FOR EARLY ADOPTERS AND PROMOTERS

1. **Strategic and Technical Leadership.** Early adopters gain first access to an advanced decision-support tool that integrates GIS simulations and WFEC Nexus analysis, positioning them as leaders in sustainable hydropower planning.
2. **Lower Risks and Better Decision-Making.** By using large datasets, climate projections and policy impact modelling, early users can anticipate regulatory, environmental and investment risks more effectively than others.
3. **Priority Access to Pilots and Capacity Building.** Promoters participate directly in prototype demonstrations, influence feature development, and receive tailored training and technical support that strengthen institutional capabilities.
4. **Influence on Policy and Regional Adoption.** Early engagement provides opportunities to shape regulatory alignment, contribute to transboundary water governance processes, and embed the tool in national and regional strategies.



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