



# HERA

## Hydropower and Environmental Resource Assessment

Participatory hydropower planning: integrating engineering, economics, and sustainability into a single platform.

HERA is an innovative computational model developed by PSR to automate the assessment of thousands of hydropower development alternatives within a river basin. The model identifies the best projects from a technical, economic, and ESG perspective.

### Why HERA?

#### Unified Multi-Domain Analysis

An unprecedented integrated approach, combining water resources, civil and environmental engineering with mathematics and geoprocessing.

#### Speed and Transparency

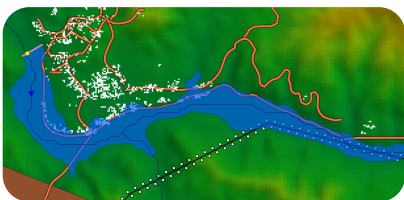
Replaces manual analyses with an automated process, supporting participatory and transparent discussions on hydropower development alternatives.

#### Driving the Energy Transition

Evaluates the potential of pumped-storage hydropower as a strategic storage solution to support the integration of renewable sources.

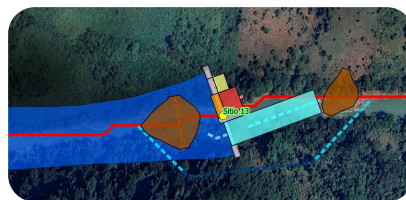
### How HERA Transforms Data into Projects

The model is organized into three sequential modules that streamline site selection, structure sizing, and the identification of the best solutions:



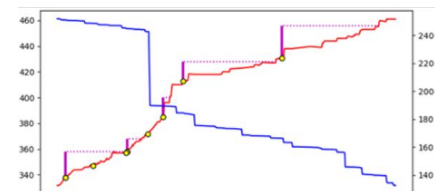
#### Geoprocessing

Socio-environmental layers and hydrological data are integrated into a digital terrain model to identify suitable locations for power generation and storage projects throughout the basin.



#### Engineering

The algorithm defines the dam axis and reservoir contour, sizing structures to generate detailed budgets (including civil works, equipment, and environmental compensations).



#### Optimization

The model selects the best sets of projects, respecting socio-environmental and economic constraints, offering alternative scenarios for participatory discussion and decision-making.

## How HERA Handles Socio-Environmental Impacts

HERA overlays critical socio-environmental layers onto the areas flooded by reservoirs, generating metrics to define constraints and costs.



### Population Density

Estimates the number of families to be relocated.



### Protected Areas

Avoids impacts on environmental protection areas.



### Urban and Rural Areas

Calculates the cost of land acquisition.



### Land Cover

Considers the impacts and costs associated with vegetation removal



### Infrastructure

Identifies interferences with highways, canals, and the power grid.

## Mapping Pumped-Storage Power Plants Large-Scale and Long-Term Energy Storage

HERA features a dedicated module to find the most suitable locations for deploying water batteries as a large-scale storage solution.



### Smart Filters

Terrain data processing to pinpoint the most favorable areas for implementing pumped-storage projects.



### Scenario Analysis

Evaluation of multiple project options with different storage capacities and power output through specialized algorithms.



### Project Refinement

Optimizes reservoir geometry and generates detailed budgets, allowing you to identify the most profitable projects.

## Immersive Visualization

The engineering layout components generated by HERA can be exported directly to Google Earth, Autodesk REVIT, and Infravorks, enabling 3D visualization and navigation of projects.



## Trusted Worldwide

Winner of the **Engie Innovation Award** in 2015, HERA has consolidated itself as a global benchmark in hydropower planning. Today, with applications in several countries, the model stands out for its ability to adapt to any regulatory or environmental context, which is why **The Nature Conservancy** trusts HERA to power its **Hydro by Design** methodology.