



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.

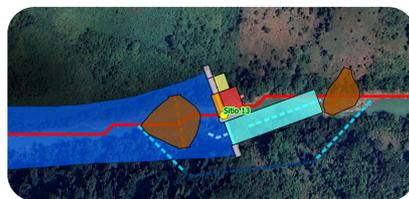
How HERA Transforms Data into Projects

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



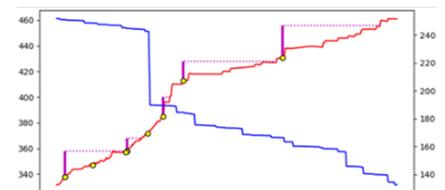
Geoprocessing

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.