CONSULTING
ENGINEERS

RENRisk

RenRisk – ILF's self-developed software tool for optimizing hydropower projects – identifies the best possible project option and simultaneously optimizes technical, economic and risk aspects, thus creating certainty for all involved stakeholders.

The major portion of the profitability of a hydropower plant stems from decisions made during the early design phases. At this early stage of the project, the project owner is most able to influence the outcome of a project at a moderate cost.

"RENRisk enables us to engineer the sustainable energy infrastructure business case that best fits your view of the market, risk appetite and return expectation."

Michael Wagner, Managing Director

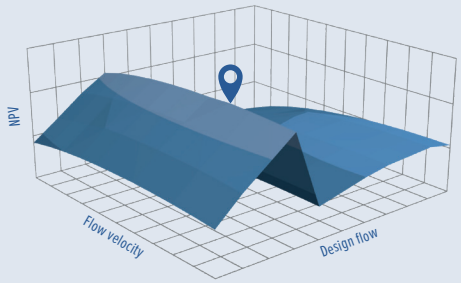
For this reason, a careful evaluation of all possible project options is a crucial task at the start of each project. In traditional project design, optimization of a project is a time and cost intensive trial and error process, where the technical and financial aspects of the project are evaluated individually, mostly by "best expert guess".

RenRisk allows projects to be evaluated objectively and analyzed as a whole. The best possible project option is identified by combining both technical and financial criteria taking into account the probabilistic nature of the input parameters.

RenRisk utilizes the Monte Carlo method to analyze a multitude of project options for thousands of hydrological and geological conditions and market scenarios to find the best solution for the project.

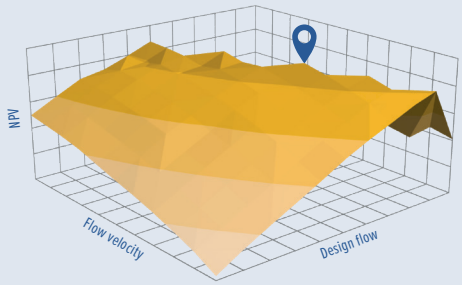
RenRisk is specially designed to identify the project option with the highest, risk-adjusted economic return and to determine the associated risk profile.

SUCCESS STORIES



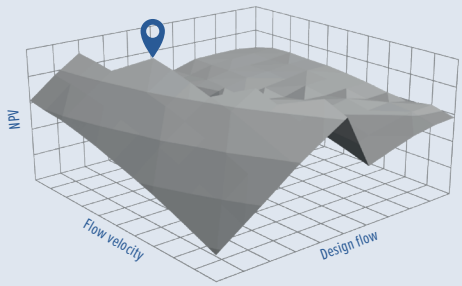
HEPP INDONESIA	INITIAL LAYOUT	RENRisk LAYOUT
Installed capacity	10 MW	10 MW
Expected CAPEX	USD 19.4 MM	USD 20.1 MM
Construction time	24 months	18 months
Internal Rate of Return	23.5 %	25.7 %
RENRisk NPV	USD 12.0 MM	USD 15.7 MM

INCREASING NPV BY MORE THAN **30%**



HEPP PERU	INITIAL LAYOUT	RENRisk LAYOUT
Installed capacity	420 MW	172 MW
Expected CAPEX	USD 830 MM	USD 395 MM
Construction time	48 months	36 months
Internal Rate of Return	6.8 %	13.0 %
RENRisk NPV	USD – 116.8 MM	USD 146.0 MM

INCREASING NPV BY MORE THAN **USD 260 MM**



HEPP CHILE	INITIAL LAYOUT	RENRisk LAYOUT
Installed capacity	45 MW	43 MW
Expected CAPEX	USD 211 MM	USD 128 MM
Construction time	42 months	23 months
Internal Rate of Return	8.8 %	14.1 %
RENRisk NPV	USD – 23.3 MM	USD 62 MM

INCREASING NPV BY MORE THAN **USD 85 MM**

THE RENRISK APPROACH INCLUDES THE FOLLOWING STEPS

1 Conducting a site visit and identifying suitable sites for the project facilities

2 Selecting the project layouts to be evaluated by **RenRisk**

3 Collecting base data relating to hydrology, geology and market aspects

4 Running **RenRisk** includes:
- Automatic variation of the main parameters (e.g. design discharge, dam height, water velocity in conveyance systems, etc.) of each project layout
- Application of probability functions to the base data to create statistically relevant scenarios
- Identification of the project option with the highest, risk-adjusted economic return, its main technical and financial parameters and the associated risk profile

5 Delivering a tailor-made and optimum project to the Client

BENEFITS UTILIZING RENRISK

- Clear identification of the best possible project
- Replacing uncertainty with certainty
- Optimization of the project based on NPV
- Optimized basis for bankability
- Minimization of risks

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Rev_1