Climate resilience for hydropower

Asia Clean Energy Forum Food-Energy-Water Resilience June 7, 2017

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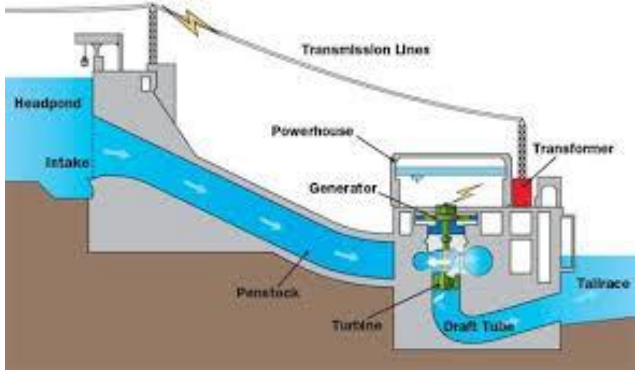
Climate Resilience built into hydropower projects

- Spillway design floods
- Flexible operating range
- Turbine re-sizing
- Basin planning scale
- Sustainability assessments



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IHA's work on climate change mitigation,adaptation and resilience

- **Emissions**: The hydropower sector has a tool to measure the impact of a reservoir on the carbon cycle in a river basin; the G-res tool, has been developed under a joint initiative between IHA and UNESCO.
- **Mitigation**: Hydropower is a renewable energy in its own right; in addition, storage projects enable other, variable renewables (solar and wind) – and larger storage means it has greater potential to enable more low carbon energy.
- **Resilience**: Any project evaluation needs to consider the climate-change risk to the services it is intended to provide. Guidelines for decision-making under uncertainty for new and modernization projects are under development.
- **Adaptation**: Ability to store and regulate water flow may provide adaptation services, to protect against increased flood/drought frequency and intensity.

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Climate resilience case studies

EBRD Qairokkum Hydro Power Rehabilitation Project

- **Project**: US$ 208 million for the rehabilitation of a 170MW HPP in Sughd province.

Challenges

- Shifting glacial, snow-melt and precipitation patterns
- Increasing hydrological variability, unreliable supply

Response

- Feasibility work based on hydrological/climate modelling
- 9 scenarios capturing uncertainty
- Economic/financial analysis of several design options (e.g. turbine selection; spillway design)
- Capacity building in predicting and managing hydrological variability

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Climate resilience guidelines for the hydropower sector

Activity and phases		Key Climate Change Question	Engineering & ESIA Activities
Getting Started		What are the key climate change issues affecting this scheme?	Project conception
Phase 1	Project Screening	Is the proposed project climate sensitive?	Pre-Feasibility Study & Environmental and Social screening
Phase 2	Initial Analysis	Is climate a dominant factor?	Feasibility Study & ESIA – establishing general project characteristics with simplified climate data
Phase 3	Climate Stress Test	What is the plausible climate risk?	Feasibility Study & ESIA – refining general project characteristics with additional climate data
Phase 4	Climate and Disaster Risk Management	Can the project cope with the potential changes in the system?	Detailed stages of feasibility-level design (specific components), preparation of design drawings and tender documents, Environment & Social Management Plans
Monitoring, Reporting and Evaluation		How can resilience be tracked, monitored, evaluated, and updated?	Construction, operation & maintenance

Next steps in climate resilience and adaption work in IHA

- Final documentation of the guidelines.
- Develop concise climate resilience eligibility criteria for the Climate Bonds Initiative, utilising the IHA/WBG Climate Resilience Guidelines.
- Climate resilience measures in the Hydropower Sustainability Assessment Protocol

Questions

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