

Chances and Risks from Identification to Operation

Training Workshop “EBRD: Financing Small Hydropower Plants in Ukraine”

Kiev, 05.10.2011



CONSULTING & IT



ENERGY



ENVIRONMENT



WATER & INFRASTRUCTURE

Program



Due Diligence of a Small Hydropower Plant,
Case Study



Economical Optimization of Installed Capacity of a Small Hydropower Plant
Case Study



Chances and Risks from Pre-Feasibility Study to Operation



Questions and Discussions



Chances and Risks in Project Phases

	Pre-Feasibility	Feasibility
Chances	<ul style="list-style-type: none"> • Desk study • Quick assessment of technical and economical feasibility of the project • Uncertainty of hydrology • Small budget for engineering 	<ul style="list-style-type: none"> • Detailed study reduces uncertainties in revenues and costs • Study prior to financial close with contingencies in the order of about 10% • Identification of any type of risks for future phase of the project • Stakeholder participation and implementation of corresponding projects
Risks	<ul style="list-style-type: none"> • Desk study • Uncertainty of costs if contingencies are not considered adequately (30%) • Uncertainty of hydrology, if no detailed information of flow from a gauge nearby • Short elaboration of works • Geological Conditions 	<ul style="list-style-type: none"> • Delay of study due to delay in field works • Unexpected site conditions, especially geology • A cost uncertainty remains due to market conditions, which are hardly predictable (steel index increase in 2005, local market conditions) • Resistance through activities of environmental and social activists and local population

Chances and Risks in Project Phases

Chances

Approval Process

- Support from Authorities, if power deficit is large
- Support from local population with future job opportunities
- Support of population if social conditions are improved through project activities

Detailed Design & Tendering

- EPC contracts limits risks for developer, however risk mechanism sharing shall be incorporated from beginning for underground works
- Tendering provides chance for realistic prices
- Good quality of tender documents necessary

Risks

- Delay due to protests during approval process from local population
- Change in design due to licensing requirements
- Depending on regulations and procedures deadlines in development of scheme
- Power Purchase Agreement with penalties for not meeting deadlines in power generation

- Detailed design is not synchronized between civil works and equipment
- Time delay in production due to high demands worldwide, local market shall be considered
- Different encountered site conditions compared to previous studies cause delay and redesign
- Hydropower equipment is a limited market
- Experienced civil contractors are required for complex works
- Cheap tenderers with lack in quality

Chances and Risks in Project Phases

	Construction	Operation
Chances	<ul style="list-style-type: none"> • To carry out works in time and budget are limited to smaller projects with uncomplicated layouts • Experienced contractors may identify measures to accelerate progress 	<ul style="list-style-type: none"> • Energy Production depends on hydrology, change in dry and wet years • Availability of Hydropower reaches over 95% • Well known technology – minor operational issues, high degree of atomization possible • Low operation and maintenance costs • Long term value
Risks	<ul style="list-style-type: none"> • Unexpected geological conditions, this applies especially for dams and underground works • Cost and time overrun during construction • Interface management has to be in place • Low quality in works and equipment, if contractors are not selected properly 	<ul style="list-style-type: none"> • Hydrological risk for power and energy production • Risks through floods on operation and safety • Additional licensing requirements through authorities • Some hydropower plants may have multipurpose use (Flood control, irrigation, water supply)

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