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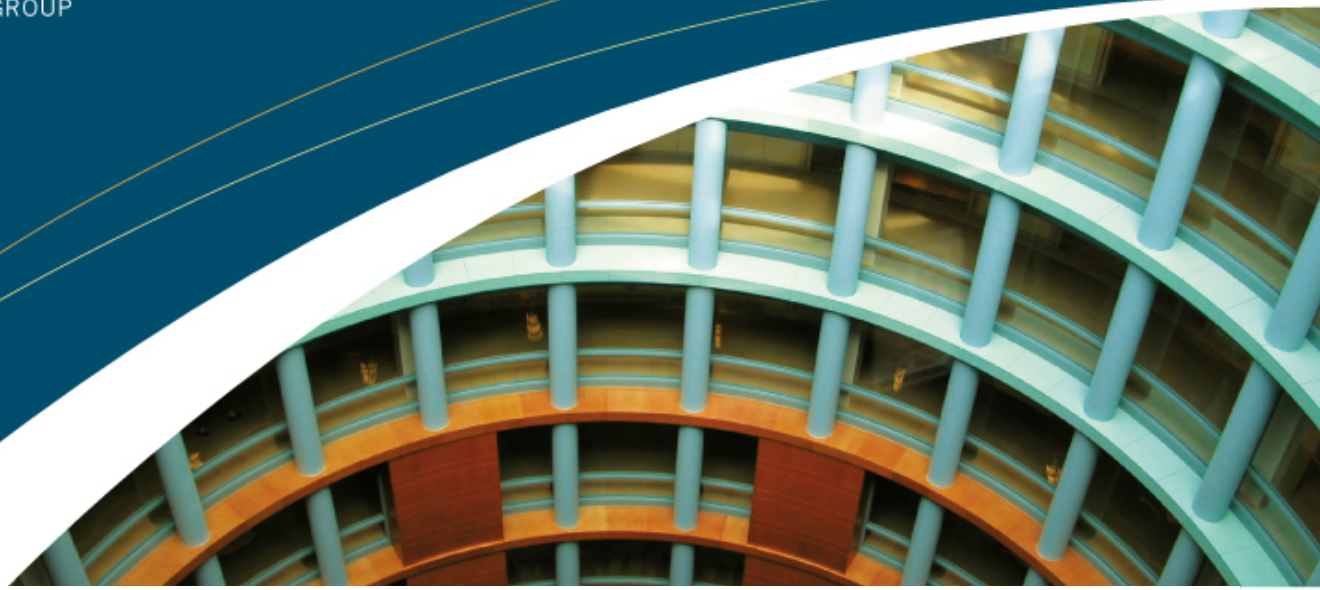

Procurement of Renewable Energy Projects

- **Hydropower, and the case of Ashta (Albania)**

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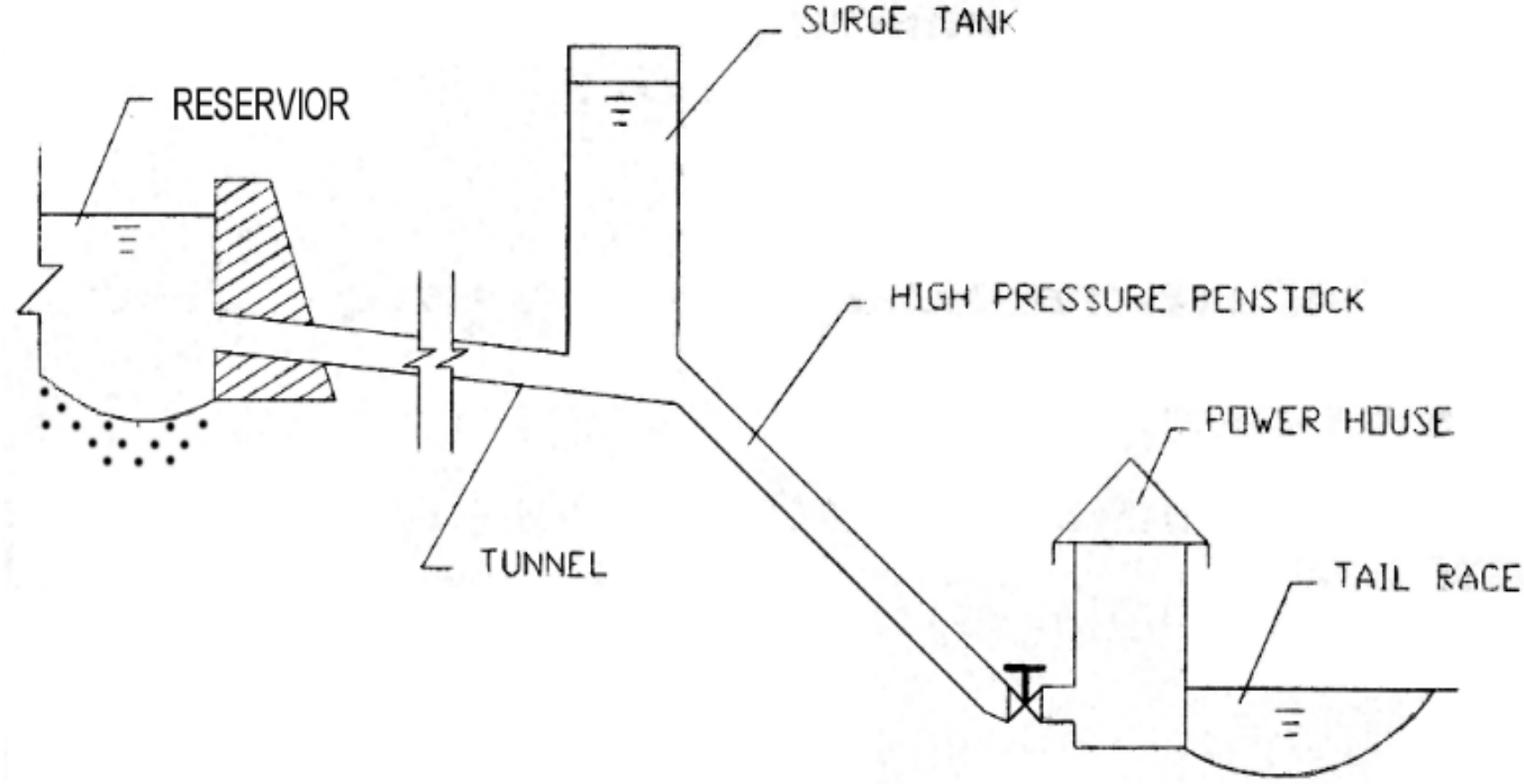
Hydropower plants

Simplified drawing of a HPP



Key Characteristics of Renewables

Hydro	Wind	Biomass	Solar	Geo
• Established and cost competitive technology • Large hydros have long development time • Dams can offer baseload and peakload • Potential for local E&S issues	• Established technology • Economics very site specific • Intermittent generation • Dependent on suitable regulatory support	• Technology risk varies with fuel type • Long-term access to low cost fuel essential • Opportunities for co-firing and co-generation	• Highest cost but largest potential of all Res • Costs declining quickly • Potential for grid and distributed generation	• Established and cost competitive base-load technology • High exploration risks and long lead times

Hydro (but also Renewable Energy) specific issues

1. Project definition

- High front-end costs, low operating costs
- Difficulty in structuring EPC contracts
- Potential conflicts between the interests of the system and the private developer

2. Risk profile

- Unusually high construction risk
- Hydrological risk
- Environmental sensitivity and costs

3. Financing constraints

- Heavily capital intensive
- High proportion of local cost
- Long payback periods

4. Regulatory Issues

- Need to conform to overall river basin plan
- Award of the Concession
- Pricing of output

5. Market risk

- Demand for power (peak/base load)
- Quality of the off-taker
- Market access

Not so easy …

Financial and Operating Performance by Project			HPP1	HPP2	HPP3	HPP4
Construction Plan	Total Planned Project Cos	(USD MM)	252	313	402	293
	- Hard Cost	(USD MM)	235	272	322	237
	- ID & Financing	(USD MM)	18	21	28	25
	- Contingency	(USD MM)	20	20	21	31
	Contingency % of Total		6.5%	9.5%	37.0%	12.0%
	Financing (Debt/Equity)		65 / 35	60 / 40	70 / 30	60 / 40
	Cost per MW	(USD MM)	1.75	2.16	1.92	3.15
	Construction Schedule	(Months)	30	36	36	36
	Tunnel Length	(KM)	19	11	18	13
	Tunelling Method		Drill & Blast	Drill & Blast	Drill & Blast	TBM
	Tunelling Risk		Contractor	Contrator	Contractor	Owner
	Sponsor Support	(USD MM)	12	12	130	53
	Sponsor Support	(% of Total Cost)	4.8%	3.8%	32.0%	18.1%
	Capped/Uncapped		Capped	Capped	Capped	Uncapped
	Format of Sponsor Support		PSA	PSA	PSA	L/C
Actual	Construction Stage		Finalized	Finalized	In Construction	In Construction
	Delays (Months)		36	21	9	15
	Cost Overruns (USD MM)		256	120	194	28
	Actual Project Cost		508	433	596	321
	Cost Overruns/Total Project Cost (%)		86.5%	38.3%	48.3%	9.6%

Risk sharing arrangements in Hydropower projects (1/2)

Risk		Primary obligant
Hydrology	▪ Temporary deficits ▪ Long-term deficits ▪ Flood damage (construction) ▪ Flood damage (operations)	▪ Usually PC, sometimes access to GV funds. Insurable. ▪ GV/OT increasingly assuming this risk. Not insurable. ▪ Generally CO risk unless force majeure, or insurance. ▪ PC risk. Insurable.
Construction risk	▪ Cost overruns ▪ Unforeseen ground conditions ▪ Delayed completion	▪ Depends on reason. Either CO, PC or shared. ▪ Increasingly borne by the OT or shared. Partly insurable. ▪ Normally CO risk, but some exposure by PC.
Performance risk	▪ Equipment ▪ Project performance ▪ Transmission	▪ Plant supplier or turnkey contractor. ▪ CO, and possibly PC. ▪ Usually the responsibility of the utility.
Environmental aspects	▪ Permitting ▪ Land acquisition/resettlement ▪ EIA	▪ PC or, by preference, OT/utility. ▪ Varies but preference for GV/utility. ▪ Varies but preference for GV/utility.
	GV – government **PC – project company**	**CO – contractor** **OT – off-taker**

Risk sharing arrangements in Hydropower projects (2/2)

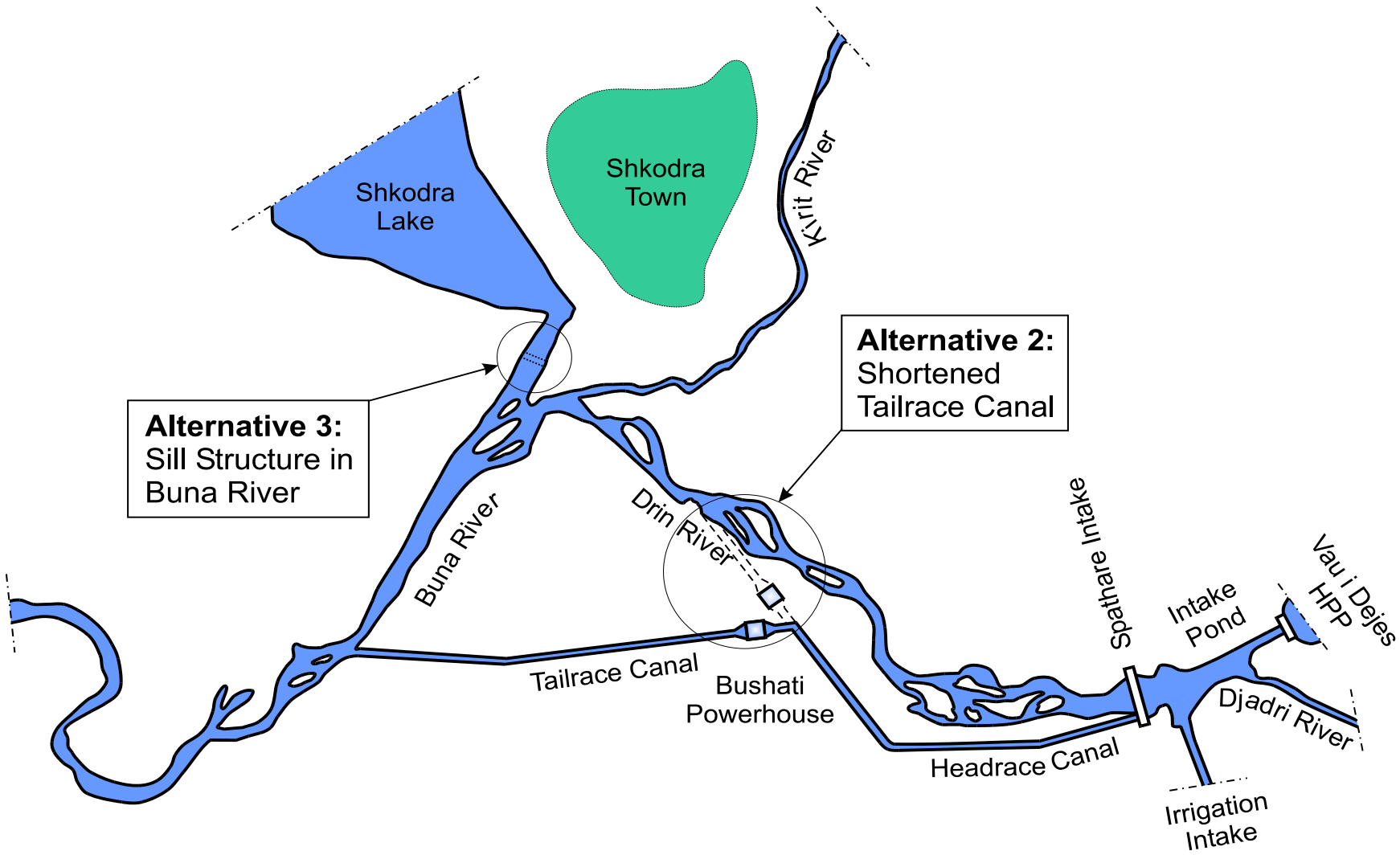
Risk		Primary obligant
Market	▪ Market risk ▪ Dispatch	▪ Usually OT through take-or-pay or PC if merchant plant ▪ Utility
Politicial	▪ Obligations of utility ▪ Changes in law ▪ Changes in tax	▪ GV obligation, part of MAGA ▪ GV obligation, part of MAGA ▪ GV obligation, part of MAGA
Financial	▪ Increased financing costs ▪ Exchange rate ▪ Cost escalation	▪ Generally passed-through or absorbed by PC ▪ Generally passed-through or absorbed by PC ▪ Usually reflected in tariff during construction and limited escalation thereafter
	GV – government **PC – project company**	**CO – contractor** **OT – off-taker**

HPP Ashta

Ashta HPP – basic information

- The project is structured as a Public-Private Partnership that consists of a long-term contract with a private partner for the construction and operation of a hydroelectric power plant (“HPP”) in Ashta
- Located on the Drin river in northern Albania, near the border with Montenegro
- The most downstream hydropower development on the Drin river cascade which already provided most of the country’s electricity
- Some of the structures (diversion weir, intake, bridges) were developed in the 70’s as part of the Bushati project (73 MW) which was later scrapped as it raised a lot of environmental and social concerns as well as riparian issues
- Ashta HPP - a new project developed by IFC and its consultants that benefits from some of the existing structures while at the same time it minimizes the potential environmental and social concerns to the greatest possible extent

Ashta HPP – alternative design



Key Transaction Structuring Issues

Understanding the Government Objective	■ Maximum installed capacity or minimum tariff level: tradeoff between the two because of the U-shaped curve of the production cost per kWh. ■ PPA or no PPA: If PPA, for the total of the production or part of it?	
Risk allocation	■ Hydrology risk ■ Construction risk ■ Expropriation	■ Credit risk ■ Geology/seismology ■ Environmental risk ■ Regulatory risk
Power Purchase Agreement (Off-take Agreement)	■ State-owned power utility is the off-taker under the PPA – payment guarantees required; ■ Tenor of the agreement – 15 years (EU limitations); ■ No capacity payment, just price per actual kWh produced; ■ Off-taker is operating HPPs upstream of Ashta on the Drin river cascade.	
Cascade Coordination	■ Ashta is the most downstream HPP on the cascade and thus, at the total mercy of the plants operating upstream; ■ Cascade coordination required to make sure that there is not too much/too little water coming downstream from the upstream HPPs, thus negatively impacting Ashta HPP production. ■ This issue is further aggravated by the fact that the off-taker is actually operating the entire cascade.	

Ashta HPP – key milestones

- 12 applications for prequalification were submitted.10 met the criteria and were pre-qualified: Statkraft, Landsvirkjun, ENBW, Compagnie Nationale du Rhône, Enel, Consortium EFT and Kelag, Consortium Holding Slovenske Elektrarne and Petrol, ATEL, Electrabel, Verbund.
- Two-day long Bidders' Conference was organized in early April 2009, preceded by organized Site Visits:
  - 9 out of 10 prequalified bidders participated in the events.
  - Substantial feedback was conveyed to the Government, allowing to make transaction more bankable.
- Final bidding documents were completed following the comments from the bidders.
- Submission of the bids – June 13, 2009. Two bids received:
  - Verbund of Austria;
  - Electrabel of Belgium and CNR of France.
- July 15, 2009: Announcement of Verbund as the winning bidder, with a tariff of 5.9 eurocents per kWh
- September 2009 – closing

Lessons learnt

Lessons Learned

- High upfront investment requirement, and development risk. Long investment payback time (energy pre-payment).

- Private sponsors and financiers are more than willing to invest in renewable energy if the **procurement process is well designed and transparent, transactions have reasonable levels of profitability, and key risks are mitigated by government**.

- **Renewable energy costs are falling** and technologies such as wind turbines are becoming competitive with alternatives.

- Need for effective **program champions** with the credibility to interact convincingly with senior government officials, effectively explain the program to stakeholders, and communicate and negotiate with the private sector.

- Finally, private sector project developers need a **clear procurement framework** within which to invest.