

Small Hydro-Power Plants (SHHP) in the West Balkans

- Potential, Barriers, Approach –

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What is specific for SHPP

- European definition: Installed power ≤ 10 MW.
- Different technology than standard large scale HPP. Special attention to environment (fish friendly turbines / blades and fish ladders).
- Improves grid stability (diversified production) and decrease network losses (close to consumers).
- Almost completely automated operation. Requires little supervision once built.
- Usually constructed by private companies. Investments highly depends on potential site. In average investment of Euro 1.5 - 2 m/MW is required (Euro 0.7 m/MW for rehabilitation)
- Requires specific regulatory framework and special subsidized price to be feasible.
- Requires long-term project financing – depending on electricity price and site quality repayment period 10-20 yrs

Natural SHPP potential (2/2)

	ALB	BIH	MAC	MNE	SRB	TOTAL
Number of potential SHPP sites	90	274	200	120	600	1,284
Potential installed power (MW)	150	278	230	100	350	1,108
Potential annual production (GWh)	750	1,360	990	450	1,500	5,050
Potential GHG emiss. reduct. (000 tCO _{2e}) ⁽¹⁾	480	1,810	1,380	600	2,000	6,270
Investment potential (mill Eur)	290	600	460	200	700	2,250

⁽¹⁾ – Estimation of GHG emission reduction potential:

ALB : 0.64 tCO_{2e}/MWh – replacement of oil fired TPP (50%) + 15% Tech. loss

BIH : 1.34 tCO_{2e}/MWh – replacement of coal fired TPP (30%) + 10% Tech. loss

MAC : 1.40 tCO_{2e}/MWh – replacement of coal fired TPP (30%) + 15% Tech. loss

MNE : 1.34 tCO_{2e}/MWh – replacement of coal fired TPP (30%) + 10% Tech. loss

SRB : 1.34 tCO_{2e}/MWh – replacement of coal fired TPP (30%) + 10% Tech. loss

Site rights - Concession / Energy permit (1/2)

Coun,	Procedure for granting rights to the SHPP site
ALB	Concessions on 35 years, DBOT model, Unsolicited application for the site, than public tender issued by Ministry for sponsor selection (extra points for initial applicant). Concession fee in % of SHPP future production.
BIH	Concessions on 25-30 years, DBOT model, Public tender issued by cantons (FBiH) or Ministry (RS) for sponsor selection . Concession fee in % of SHPP future production.
MAC	Concessions on 20 years, DBOT model, Public tender issued by Ministry for sponsor selection, Upfront fee=(73 €/kW + mark up) P<1MW or (44€/kW + mark up) P>1MW Annual operational fee = 2% of annual production

Country status in respect to Kyoto Protocol

	ALB	BIH	MAC
UNFCCC Framework Convection adopted	Oct, 94	Sep, 00	Jan, 98
Kyoto Protocol ratified	Apr, 05	Apr, 07	Nov, 04
Designated National Authority (DNA) established	Nov, 08	No	Jun, 06
CDM strategy adopted	09	No	07
CDM projects approved	0	0	0

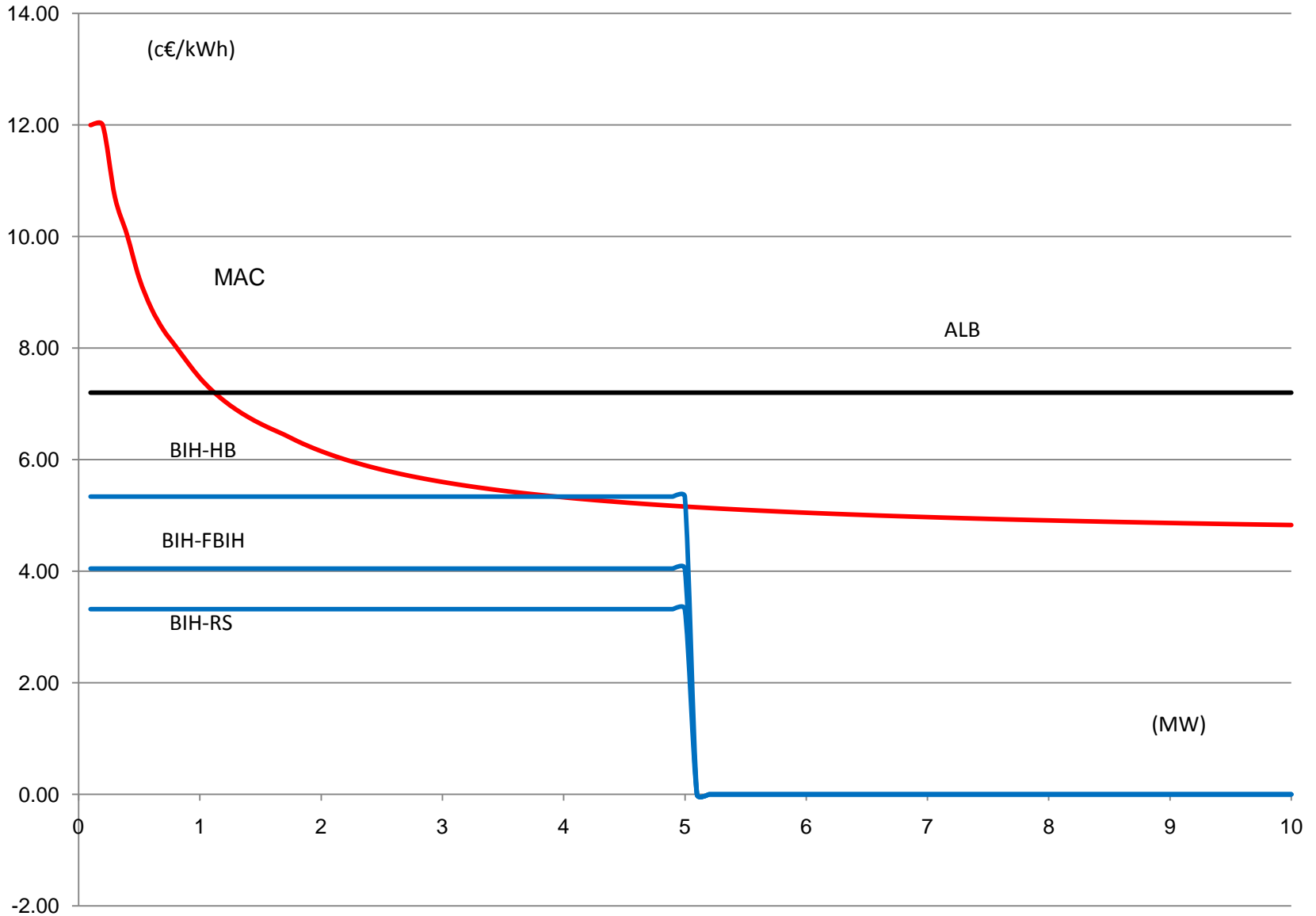
Site rights - Concession / Energy permit

Coun,	Granted sites / constructed SHPP
ALB	90 existing (old) SHPP owned by: KESH (42), private (16), concess. (32) Out of 90 existing only 36 in operation, other requires rehabilitation More than 60 new concessions granted / 4-5 started with construction
BIH	11 existing (old) SHPP owned by state In FBiH: 116 new concessions granted / 10 under constr. / 7 in operation In RS: 107 new concessions granted / 3 under constr. / 2 in operation
MAC	More than 70 new concessions granted (first contract for 12 locations signed on June 2009 with Austrian company)

Feed-in tariffs overview

Country	Feed-in tariff description
ALB	1.1x(average imported electricity price for previous year) in local currency For 2009 price is 9.37 ALL/kWh (7.2 c€/kWh)
BIH	For installed power ≤ 5 MW, 0.80x(electricity price on middle voltage) FBiH => 4.05 c€/kWh, HB => 5.34 c€/kWh, RS => 3.32 c€/kWh
MAC	20 years guaranteed price in Euros, block tariff according production Monthly produc.: 0–85MWh => 12.0c€/kWh, 85–170MWh => 8.0c€/kWh, 170-350MWh => 6.0c€/kWh, 350-700 => 5.0c€/kWh, > 700 => 4.5c€/kWh

Feed-in tariffs overview (2/2)



Issues at regulatory level (1/2)

- **Concessions / Energy permits**
 - DBOT (design-build-operate-transfer) concession model restrict “step-in” rights (BIH, MAC, MNE), except in Albania where is explicitly allowed in Concession Law amendments (Sep, 2008),
 - Non-transparent sponsor selection (all-countries)
 - In some cases tenders are based on wrong hydrol. data or without including other water users. Initial design cannot be changed without special permit.
 - Complicated selection criteria (ALB, MAC), unsatisfactory sponsor’s check (all countries)
- **Feed-in Tariff**
 - Low level of SHPP electricity price (BIH)
 - No guaranteed minimal price and annual price variations (ALB, BIH, MNE)
 - No subsidized price time horizon specified (ALB, BIH, MNE)
- **Grid connection**
 - Connection costs borne by SHPP sponsors (all countries),
 - Weak and non-reliable network near potential SHPP sites (all countries)
 - No “take or pay” clause for undelivered energy due to network fault (all cntr)

Issues at regulatory level (2/2)

- Energy off-take
 - Energy off-take is guaranteed by Energy law (all countries) but details are not precisely defined in bylaws.
 - Absence of long-term PPA,
- Public institutions/company permits
 - SHPP construction requires many (30-40) permits that should be issued by public institutions, companies, and municipalities. Simplification is necessary.
- Land rights
 - Not secured land before tendering sites (sponsor have to solve this problem after concession contract signing),
 - According to the DBOT model purchased land have to be registered as state land (to secure property transfer after expiration of concession contract)
 - Slow and inefficient expropriation procedure
- Kyoto protocol
 - DNA not established in BIH. No strategy in BIH and MNE, no staff training,
 - No CDM project implemented in West Balkans

SHPP sponsors in the West Balkans

- In general all SHPP sponsors (concession owners) could be classified in following groups:
 - A) Local entrepreneurs, with low or without SHPP knowledge, and with potential to provide 15-30% equity capital. Looking for debt financing. Low understanding of innovative facilities.
 - B) Local technical-consulting company, with satisfactory SHPP knowledge to develop project, but without financial potential for construction. Looking for international partner for project implementation.
 - C) Local (very small) companies without technical knowledge and without financial potential. Usually they offered unrealistically high concession fee (10-20%). Faced with concession time limit looking for project buyers.
 - D) International companies with significant SHPP experience and good financial potential for project implementation.
- Sponsor's structure in the West Balkans:
 - ALB: Category A is dominant. Education on how to improve designs and how to use different financing options could be useful.
 - BIH: Mixture of all categories. Some concessions already expired and will be subtracted and re-tendered. Education on how to improve designs and how to use different financing options could be useful.
 - MAC: Category D or D-A consortiums is dominant. Significant number of concession contracts will be signed until end of 2009.

FIs in the West Balkans

- Banking sector in the West Balkans has been reformed in last 10 years with a significant inflow of foreign banks
- Appear to be “overbanked”
 - ALB - 17 banks,
 - BIH – in FBiH 19 banks, in RS 10 banks
 - MAC - 18 banks,
- Not experienced with RE projects financing
 - Limited understanding of SHHP
 - Limited understanding of project financing,
 - Financing limited to existing clients,
 - Financing based on classical collateral

Risks perceived (1/2)

- Technical risks (leads to lower energy production and / or higher construction costs)
 - Poor design (low efficiency, oversized turbines, old technology)
 - Wrong estimation of hydrology (lack of long-term measurement)
 - Unexpected geological problems (water losses, expens. civil works)
 - Problems with distribution network reliability (frequent outages)
- Regulatory risks (leads to project development slowdown, changing of initially estimated benefits)
 - Huge number of permits (30-40) issued by public different institution/companies in some cases without specified time-limit
 - Low level of cooperation between ministries and between state and local institutions (project development on more then 60 granted concessions in RS (BIH) was blocked – sites in protected areas)
 - Changes in feed-in tariff methodology

Risks perceived (2/2)

- Financial risks (leads to no interest for sponsors)
 - Sponsor's lack of financing (no strict check on sponsor's financial capabilities during selection process)
 - Cost overruns (caused by poor design or unexpected problems)
 - Hardly predictable long-term sponsor's income (annual variations of feed-in tariff and absence of long-term PPA)
 - Financing limited to existing clients, and on the basis of classical collateral
 - No "step-in" right and project takeover in case of sponsors

Project Components and Activities

	ALB	BIH	MAC
Regulatory level			
1.1. Deep research of existing legal framework	X	X	X
1.2. Inter-governmental workshops	X	X	X
1.3. Country-level workshops	X	X	X
1.4. Assistance in “step-in” right introduction		X	X
1.5. Assistance in permission for design changing		X	X
1.6. Assistance in achieving fully functional DNA		X	
Sponsors (Concession owners)			
2.1. Country-level workshops: design and modern technologies	X	X	X
2.2. Providing review of existing designs	X	X	X
2.3. Providing assistance in projects bundling		X	
Financial Institutions (Banks)			
3.1. Initial country level workshop for FIs	X	X	X
3.2. Development of SHHP financing manual			
3.3. Development of template for SHHP cash-flow projections			
3.4. In-depth support for FIs	X	X	X
3.5. Promotion of IS facilities	X	X	X