# 2006 ANNUAL REPORT





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#### INTRODUCTION



Supervisory Board and Management of JP Elektroprivreda HZ Herceg Bosne d.d. Mostar since 2004



Vlado Marić. B.Sc. (Mech. Eng.)



### General Manager's Remarks

Elektroprivreda Hrvatske zajednice Herceg Bosne, d.d. Mostar (EPHZHB), a public company for power generation, distribution and supply is one of three power utilities in Bosnia and Herzegovina.

It was established on August 28, 1992 and since April 28, 2004 it has been a joint stock company. The stock capital of the Company includes the joint-stock capital amounting to 10% of the stock capital of the Company and the state capital amounting to 90% of the stock capital of the Company. There are 1558 employees with a very good qualification structure. We supply 182.776 customers. As a result of restructuring of the power sector in BiH, the Power Transmission Division has not been a constituent part of our company since March 1, 2006.

Elektroprivreda HZHB has six hydro power plants with the total capacity of 792 MW. The total power generation in 2006 was 1884 GWh. It was 36.5% higher than the plan.

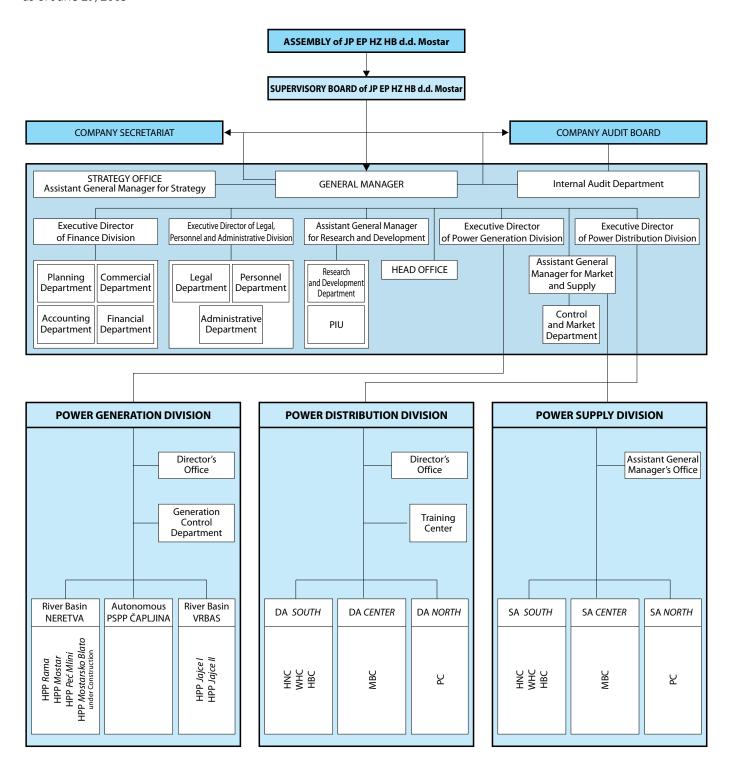
To meet the electricity demand of big customers, this company imports 2/3 of electricity from the international market. The new HPP Mostarsko Blato which construction is in progress will contribute to solving the problem of electricity import and to development of the Company. The annual output will be increased by 170 GWh and total capacity by 62 MW.

Special consideration is given to the projects for the use of wind energy and additional research for the Kongora Lignite Mine and Thermal Power Plant Project. The annual output of the plant will be 3000 GWh. The project for construction of the small hydro power plants Vrilo, Koćuša and Vrletna Kosa is in the preparatory stage. By construction of these plants, the electricity demand will be met in the area under the responsibility of EPHZHB.

Introducing the ISO standard in power generation, certifying the energy from the new plants as green energy, operating conditions and control that is at high level will ensure even better results in the power generation and business operation of EPHZHB.

### Organization Chart of EP HZ HB

as of June 29, 2005



### SUPERVISORY BOARD STATEMENT

on Project of Use of Renewable Energy Sources in Power Generation Referring to the Company Statute,

Taking into account:

The Directives 2003/54/EC dated June 26, 2003, particularly the provisions relating to the development and approach to the competitive electricity market,

The Directives 2001/77/EC of the European Parliament and Council dated September 27, 2001 for promotion of power generated from renewable sources,

The Treaty on Power Community between EU from one side and the signatory countries from the other side from Athens dated June 25, 2005,

Electricity Act of the Federation of Bosnia and Herzegovina dated August 7, 2002, particularly the objectives from Article 2,

Taking into account the global challenges: safe power supply, sustainable development, climatic changes, employment and technological development as well as the challenges of the structural adjustment of the Company to the demands and mechanisms of the electricity market which require proper responses,

Determined to promote and generate power from renewable sources to make the natural rich energy sources in this area available to the human needs with environmental protection,

Being responsible for the Company in the process of structural and proprietary changes as well as the demands of the competitive electricity market in the surroundings,

Being familiar with the objectives of the Project, considering its feasibility and contribution to the successful business operation and goodwill of the Company,

Respecting the recommendation of the Company General Manager,

We accept the Project as follows:

Article 1

The Project of Use of Renewable Energy Sources in Power Generation is a strategic objective of the Company.

Article 2

The Supervisory Board expresses its dedication to the Project, willingness and determination for the direct support in its implementation and achievement of the objectives.

Article 3

According to the legal provisions, the Statute and documents of the Company, the Supervisory Board will, in cooperation with the Company Assembly, take all necessary measures to encourage, facilitate and, if appropriate, strengthen the cooperation with other entities institutionally for achievement of the ultimate objective of the Project – commercial power generation from wind energy.

Article 4

According to the legal provisions, the Statute and documents of the Company, we urge the General Manager of the Company on prompt preparation of necessary documents and opening the procedures for establishing the organizational units and providing the funds necessary for implementation of the Project.

Chairman of the Supervisory Board,

Jerko Pavličević, M.Sc.

(Houliceuil

### **Company Performance**

### **Profit and Loss Account**

Pursuant to the Law on Power Transmission, Regulator and System Operator of Bosnia and Herzegovina ("Official Gazette of BiH" Issues 7/02 and 13/03), the Transmission Division was included in establishing the Power Transmission Company at the state level and has not been a constituent part of our company since March 1, 2006.

On March 1, 2006, according to the new organizational structure, the Distribution Division was unbundled into the Distribution Division and Supply Division.

In the period January-December, 2006, JP Elektroprivreda HZ Herceg Bosne, d.d. Mostar operated at a gross profit of BAM 1,002,219.

The total revenue was BAM 370,258,137. It was 21% higher than in the previous year.

The total expenses were BAM 369,255,918. They were at the level of the revised plan for 2006 and 23 % higher than in the previous year.

The operating expenses were BAM 338,849,151, financing expenses (interest and negative rate of exchange differentials) were BAM 1,801,001 and other expenses were BAM 28,605,776.

The transmission costs were about BAM 36 M. They were 59% higher than in 2005 when the Transmission Division was a constituent part of our company. This considerably reduced a gross profit in 2006 in comparison with 2005.

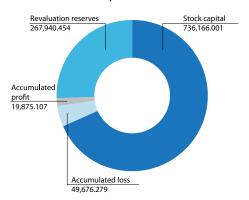
On December 31, 2006, the total receivables from direct and other customers were BAM 190,602,214. They were 3% or BAM 5.5 M lower than on December 31, 2005.

#### **Balance Sheet**

On December 31, 2006, the Company assets value was BAM 1,170,161,795. It was 14% lower than on December 31, 2005 as a result of unbundling of the Transmission Division from our company.

Balance Sheet	2005	2006	Index
Fixed assets	1,235,026.380	992,417.426	80
Current assets	122,222.225	177,744.369	145
ASSETS	1,357,248.605	1,170,161.795	86
Capital	1,087,347.656	977,457.334	90
Long-term liabilities	237,778.157	136,338.362	57
Current liabilities	32,122.792	56,366.099	175
LIABILITIES	1,357,248.605	1,170,161.795	86
Operating results			
Core activities revenue	296,079.852	362,209.107	122
Financing revenues	233.098	1,245.154	534
Other operating revenues	8,593.294	6,803.876	79
REVENUES	304,906.244	370,258.137	121
Operating expenses	275,853.201	338,849.151	123
Financing expenses	6,724.445	1,801.001	27
Other expenses	17,112.873	28,605.766	167
EXPENSES	299,690.519	369,255.918	123
Profit / Loss	5,215.725	1,002.219	19

### Structure of capital



#### **COMPANY PERFORMANCE**

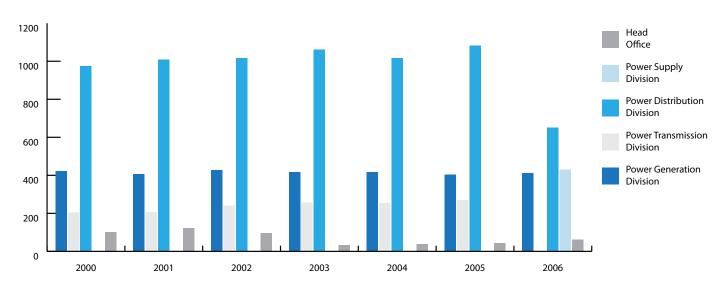
The vertical (structural) analysis of the assets shows a share of the fixed assets of 85% and current assets of 15%.

In the structure of liabilities, a share of the capital was 83%, long-term liabilities of 12% and current liabilities of 5%.

In the structure of capital, the stock capital was BAM 736,166,001.00, special revaluation reserves were BAM 274,183,191, accumulated profit was BAM 16,784,422 and accumulated loss was BAM 49,676,279.

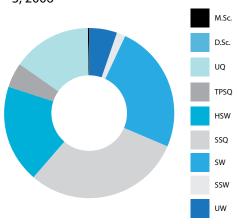
The total number of stocks is 7,361,660 and 90% of them are state-owned. On December 31, 2006 there were 1,589 stockholders.

**Employees** Number of employees per organizational units 2000-2006



### Qualification structure

1558 employees as of December 3, 2006



Key: UQ (University qualifications); TPSQ (Twoyear post-secondary school qualifications); HSW (Highly skilled worker); SSQ (Secondary school qualifications); SW (Skilled worker); SSW (Semiskilled worker); UW (Unskilled worker)

Qualification	Gene	wer ration sion	Distril	wer oution sion		Supply		ad ice	то	TAL	re in %
Qualifi	Dec. 31, 2005	Dec. 31, 2006	Dec. 31, 2005	Dec. 31, 2006	Dec. 31, 2005	Dec. 31, 2006	Dec. 31, 2005	Dec. 31, 2006	Dec. 31, 2005	Dec. 31, 2006	Structure in
1	2	3	4	5	6	7	8	9	10	11	13
UW	62	46	44	31		5	2	2	UW	84	5
SSW	4	2	24	18		6	0	0	SSW	26	2
SW	82	80	354	160		140	1	1	SW	381	24
SSQ	110	117	323	164		173	12	12	SSQ	466	30
HSW	59	76	174	173		41	0	0	HSW	290	19
TPSQ	16	19	51	38		17	2	2	TPSQ	76	5
UQ	69	70	112	68		48	25	45	UQ	231	15
M.Sc.	1	1	1	0		1	1	1	M.Sc.	3	0
D.Sc.	1	1	0	0		0	0	0	D.Sc.	1	0
Total	404	412	1083	652	0	431	43	63	0	1558	100

### **HPP RAMA**

	Number of generating sets	2			
MAIN DATA	Installed capacity	160	MW		
	Plant type	Derivation storage	e		
ORS	Туре	3-phase synchronous	S-4758-16		
GENERATORS	Manufacturer Končar				
Ä	Put into operation	1968			
GE	Nominal power	90 MVA			
VES	Туре	Francis			
TURBINES	Manufacturer	Litostroj			
₽	Installed capacity	80	MW		
~	Dam construction height	103	m		
DAM and RESERVOIR	Dam height	96	m		
	Hydraulic height	89	m		
	Crest length	230	m		

The hydro power plant Rama is the largest plant in the system of the hydro power plants on the Neretva river. It is located in Herzegovina- Neretva Canton. The power house is situated by the road Jablanica-Rama and the dam and reservoir in the very vicinity of the town of Prozor-Rama. It was put into operation in 1968. The plant is included in the system of generation remote control from the Main Dispatch Center in Mostar.



7 1	Number of generating sets	3		
MAIN DATA	Installed capacity	72	MW	
2 0	Plant type	Dam storage		
RS	Туре	3-phase synchronous	S-6546-40	
GENERATORS	Manufacturer	Končar		
Ä	Put into operation	1987/1988		
B	Nominal power	30	MVA	
LES	Туре	Kaplan	K - 5	
TURBINES	Manufacturer	Litostroj		
Ē	Installed capacity	23.6	MW	
<u>~</u>	Dam construction height	44	m	
DAM and RESERVOIR	Dam height	28	m	
	Crest length	255.6	m	
~	Crest elevation	81	m a.s.l.	

The hydro power plant Mostar is the last plant in the range of the plants constructed on the Neretva river and is located 3.73 km upstream of the city of Mostar in Herzegovina- Neretva Canton. It was put into operation in 1987 and again in 1997 after rehabilitation of the war damages. The plant is included in the system of generation remote control from the Main Dispatch Center in





#### POWER GENERATION DIVISION / RIVER BASIN NERETVA

The hydro power plant Peć Mlini is located in the municipality of Grude in West Herzegovina Canton. It collects the Tihaljina water at the height difference of 107 m between the Imotski-Grude field - Nuga and power house in the Petnik hill foot in Peć Mlini. It was put into operation in 2004. The plant is included in the system of generation remote control from the Main Dispatch Center in Mostar.

### HPP PEĆ MLINI

71	Number of generating sets	2	
MAIN DATA	Installed capacity	15	MW
	Plant type	Derivation run of	river
RS	Туре	3-phase synchronou	s
ATC	Manufacturer	Končar	
GENERATORS	Put into operation	2004	
GEI	Nominal power	18	MVA
LES	Туре	Francis	K - 5
TURBINES	Manufacturer	Litostroj	
	Installed capacity	15.88	MW



#### POWER GENERATION DIVISION / AUTONOMOUS PUMPED STORAGE PP ČAPLJINA

The pumped storage power plant is located on the lower Trebišnjica river in Herzegovina- Neretva Canton. It collects its catchment inlfow water and the Trebišnjica water through the Popovo field. It was put into operation in 1979. Activities for its including in the system of generation remote control from the Main Dispatch Center in Mostar are near the end.

### PSPP ČAPLJINA

Installed capacity 420 MW	
720 MW	
Plant type Pumped storage	
Type 3-phase synchronous	
Type 3-phase synchronous  Manufacturer AEG  Put into operation 1979  Nominal power 240 MVA	
Put into operation 1979	
Nominal power 240 MVA	
Type Francis	
Type	
Installed capacity 210 MW	
© Upper reservoir level - maximum 231.5 m a.s.l.	
Upper reservoir level - maximum 231.5 m a.s.l. Upper reservoir level - minimum 224 m a.s.l. Nominal discharge – turbine operation 112 m3/sec	
Nominal discharge – turbine operation 112 m3/sec	
Nominal discharge – pump operation 85 m3/sec	



#### POWER GENERATION DIVISION / RIVER BASIN VRBAS

### HPP JAJCE I

71	Number of generating sets	2	
MAIN DATA	Installed capacity	60	MW
2 0	Plant type	Derivation run	of river
RS	Туре	3-phase synchr	onous
ATC	Manufacturer	Končar	'
GENERATORS	Put into operation	1957	,
뜅	Nominal power	36	MVA
ES	Туре	Francis	
TURBINES	Manufacturer	KMW	
Ē	Installed capacity	30	MW
	Minimum operating reservoir level	425.8	m a.s.l.
₩₽ <u></u>	Maximum operating reservoir level	427.1	m a.s.l.
DAM and RESERVOIR	Headrace tunnel length	5700	m
~	Headrace tunnel diameter	5.4	m

The hydro power plant Jajce I is located on the left bank of the Vrbas river by the road Jajce-Banjaluka in Middle Bosnia Canton. It is 7 km far from the town of Jajce. It collects the water of the Big Pliva lake which is situated at the height of 428 m asl. It was put into operation in 1957. The plant is included in the system of generation remote control from the Main Dispatch Center in Mostar.



### HPP JAJCE II

	Number of concepting sets	2		
MAIN DATA	Number of generating sets	3		
	Installed capacity	30	MW	
	Plant type	Derivation run of riv	/er	
SRS	Туре	3-phase synchronou	S	
ATC	Manufacturer	Končar		
GENERATORS	Put into operation	1954		
뜅	Nominal power	12.5	MVA	
LES	Туре	Francis		
TURBINES	Manufacturer	Voith + Litostroj		
₽	Installed capacity	10	MW	
<u>~</u>	Minimum operating reservoir level	326.5	m a.s.l.	
DAM and RESERVOIR	Maximum operating reservoir level	328.5	m a.s.l.	
	Headrace tunnel length	2880	m a.s.l.	
	Headrace tunnel diameter	5.5	m	

The hydro power plant Jajce II was constructed on the Vrbas river 17 km downstream of the town of Jajce in Middle Bosnia Canton. It was put into operation in 1954. The plant is included in the system of generation remote control from the Main Dispatch Center in Mostar.







### HPP Mostarsko Blato under Construction

HPP Mostarsko Blato will be located south-west of Mostar, 100km from Sarajevo, Split and Dubrovnik and about 50km from the Adriatic Sea in a straight line. It will collect the Lištica and Ugrovača catchment inflow water at the head of 176m between Mostarko Blato reservoir and the Neretva river.

#### Technical characteristics

Plant type	Derivation storage
Number of generating sets	2
Turbine type	Francis, vertical
Rated discharge (m3/s)	2x18; max. 2x20
Maximum gross head(m)	182
Gross head for normal operating reservoir level 223.50 (m); tail water level 48.00	176.50
Gross head for minimum operating reservoir level 221.50 (m); tail water level 47.00	174.50
Gross head for maximum operating reservoir level 229.00 (m); tail water level 48.00; Q=18m3/s	181
Maximum head for maximum operating reservoir level 229.00 (m); tail water level 48,00; Q=7.2m3/s	180.55
Net head for normal operating reservoir level 223.50 (m); tail water level 48.00; Q=18m3/s	172.70
Minimum head for minimum operating reservoir level 221.50 (m); tail water level (m) 49.00	163.32
Rated speed of rotation (o/min)	500
Nominal power(MVA)	2x35.300
Generator rated voltage (V)	10 500 V± 5%
Generator rated power factor	0.85
Rated capacity at sill (MW)	2x29.880
Maximum and minimum capacity (MW)	2x32.650 i 9.851
Mean annual output(GWh)	167 GWh
Block transformer rated power (MVA); Transmission ratio(kV/kV); tapping range	35.3 10.5/115; ±2x2.5%
Tapping	Longitudinal; Under zero voltage

The power house will be of a surface type and the following equipment will be installed in it:

- 1. Vertical shaft Francis turbines Maximum net head Hmax=180m; maximum discharge Qmax=20m3/s; maximum capacity Pmax=32650kW. Rated net head Hn=178m; rated discharge Qn=18m3/s; rated capacity Pn=29960kW.
- 2. Vertical three-phase synchronous generator Rated power 35300kVA, rated voltage 10500V ±5%, frequency 50Hz, power factor 0,85, rotor mass (mD2) 275tm2, static type excitation.

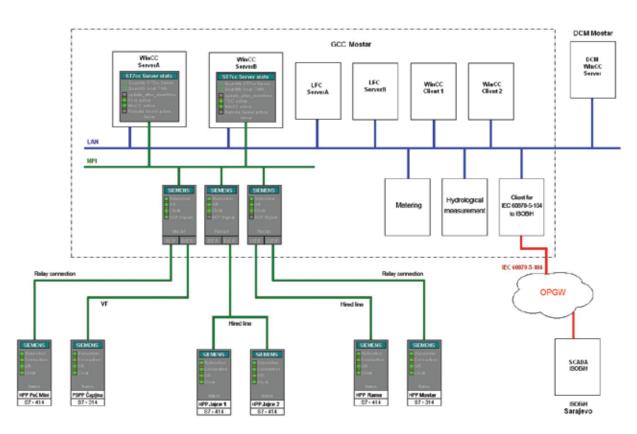
The following equipment will be installed upstream of the power house:

- 1. Three-phase oil transformer Rated power (HV, LV) 35.3MVA, rated frequency 50Hz, cooling ONAN/ONAF (60/100%), rated voltage 115/10.5kV, tapping under zero voltage, tapping range on HV  $\pm 2x2,5\%$ , vector group YNd5.
- 2. 123kV, SF6 switchgear It will be a modular outdoor switchgear equipped with two line feeders, two generator-transformer feeders and bus bar and measuring sections.
- Hydro mechanical equipment will be equipped with a trash rack and stoplog in the intake structure, pressure gate in the headrace tunnel, Ø3.0m butterfly valve in the valve chamber, draft tube gates and flap gates in the tail water basin.
- 360m surface penstock liner, 3.0m inner diameter liner, 1.6m inner diameter bifurcation.
- Three 50kN, 200kN and 1000/100kN bridge cranes.

### Main Dispatch Center

At the beginning of 2006, the Generation Control Center (GCC) Mostar assumed full responsibility for activities of the Main Dispatch Center of JP EP HZ HB. The Center is well-equipped and has a very good personnel for generation planning and control. The following equipment is installed in the Center: a modern SCADA system for remote supervision and control, automatic secondary control system, remote meter reading system and modern hydrometeorological system with remote result reporting from the stations.



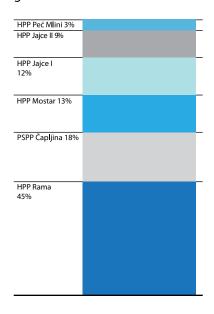


### POWER GENERATION DIVISION

#### Total power generation in 2005 and 2006 (GWh)

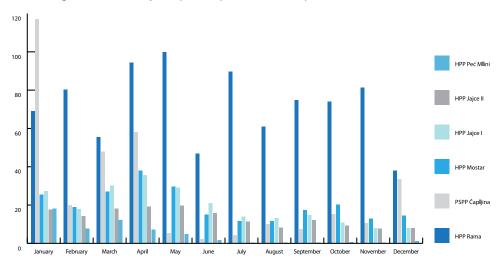
	2005	2006
HPP Rama	729.26	864.64
PSPP Čapljina	317.59	331.68
HPP Mostar	239.02	242.47
HPP Jajce I	240.63	229.07
HPP Jajce II	173.65	161.70
HPP Peć Mlini	68.53	54.00
TOTAL	1768.69	1883.5

# Share of plants in total power generation in 2006



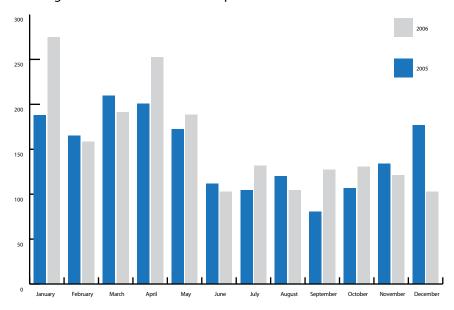
Power gen	Power generation in hydro power plants of JP "EPHZHB" in 2006 per months (GWh)						
	HPP Rama	PSPP Čapljina	HPP Mostar	HPP Jajce I	HPP Jajce II	HPP Peć Mlini	TOTAL
January	68.95	117.07	25.52	27.22	17.52	18.13	274.41
February	80.15	19.92	18.89	17.79	14.24	7.42	158.63
March	55.55	47.91	26.95	30.14	18.27	11.16	190.98
April	94.39	58.12	37.92	35.53	19.27	7.25	252.48
May	99.84	5.28	29.75	29.08	19.74	4.81	188.51
June	46.99	2.11	14.93	20.96	15.85	1.77	102.61
July	89.60	4.42	11.70	13.85	11.41	0.50	131.48
August	60.96	10.10	11.59	13.08	8.24	0.40	104.36
September	74.88	7.54	17.38	14.76	12.11	0.50	127.17
October	73.99	15.15	20.35	10.88	9.38	0.61	130.35
November	81.31	10.60	12.99	7.89	7.82	0.34	120.96
December	38.04	33.48	14.51	7.89	7.85	1.09	102.86
TOTAL	864.64	331.68	242.47	229.07	161.70	54.00	1883.5

### Power generation in hydro power plants in 2006 per months



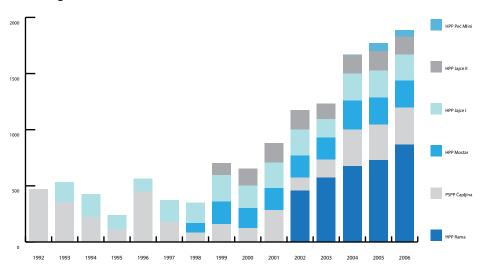
#### Total power generation in 2005 and 2006 per months 2005 2006 187.70 274.41 January February 165.07 158.63 March 209.40 190.98 April 200.46 252.48 \_ 188.51 May 172.12 111.37 June 102.61 July 104.64 131.48 August 119.98 104.36 September 80.30 127.17 October 106.72 130.35 134.03 November 120.96 December 176.91 102.86 TOTAL 1768.69 1883.5

### Power generation in 2005 and 2006 per months

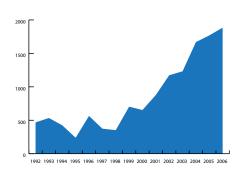


Power g	eneration trend	d from 1992	to 2006				
	HPP Rama	PSPP Čapljina	HPP Mostar	HPP Jajce I	HPP Jajce II	HPP Peć Mlini	TOTAL
1992		468.18					468.18
1993		354.87		178.75			533.62
1994		221.57		202.98			424.55
1995		107.84		130.41			238.25
1996		446.71		117.99			564.70
1997		176.60		198.13			374.73
1998		83.37	86.58	181.70	-		351.64
1999		158.48	202.58	233.01	108.97		703.04
2000		121.65	181.13	197.95	152.63		653.37
2001		283.18	197.34	226.81	170.31		877.64
2002	455.00	117.00	199.00	229.00	173.00		1173.00
2003	570.00	162.00	200.00	163.00	137.00		1232.00
2004	674.98	327.20	257.10	241.48	161.00	6.89	1668.65
2005	729.26	317.59	239.02	240.63	173.65	68.53	1768.69
2006	864.64	331.68	242.47	229.07	161.70	54.00	1883.5

### Power generation trend from 1992 to 2006



Power generation from 2000 to 2006 (GWh)								
	2000	2001	2002	2003	2004	2005	2006	
HPP Rama			455.00	570.00	674.98	729.26	864.64	
PSPP Čapljina	121.65	283.18	117.00	162.00	327.20	317.59	331.68	
HPP Mostar	181.13	197.34	199.00	200.00	257.10	239.02	242.47	
HPP Jajce I	197.95	226.81	229.00	163.00	241.48	240.63	229.07	
HPP Jajce II	152.63	170.31	173.00	137.00	161.00	173.65	161.70	
HPP Peć Mlini					6.89	68.53	54.00	
TOTAL	653.37	877.64	1173.00	1232.00	1668.65	1768.69	1883.5	



Vision: To make rich energy sources that God has given to this area available for human needs with environmental protection, and to become a recognizable subject in Europe.

Mission: Taking into consideration global challenges, to start the projects that will ensure the use of stable energy sources and speed up the general, economic, social and sociological growth, all for our own prosperity and the benefit of all people living in this area.

Strategy: Using advanced technologies, working on our own development and organization through good organization architecture that supports creative efforts of human resources, to preserve our independency, increase efficiency, improve development and ensure the leading role in the power sector in the region contributing to our survival and development of this area.

### **Generation Development Projects**

According to the PWC Regional Balcans Infrastructure Study, an increase in the electricity demand in the area under our responsibility is given in the table below.

Year	Power (GWh)	Capacity (MW)
2010	4000	610
2015	4800	730
2020	5740	860

Having in mind the power and capacity demand in the period up to 2023 and the responsibility for our survival, growth and development, we must take into consideration the use of wind and mineral energy in addition to hydro energy.

### 1.Use of Wind Energy

In mid 2004, 10 m measuring masts were installed in 10 sites. After one year of measurement on 50 m masts, the obtained results were very good and the consultancy firm NIPSA from Madrid prepared the Report on Wind Resource and the Study on Use of Wind Energy for Power Generation presented to the public in May 2006. The Study was reviewed by the reputable firm GARRAD HASSAN from Zaragoza.

Three selected sites are: Borova Glava, Livno (26 wind turbines/total installed capacity 56 MW); Mesihovina, Tomislavgrad (22 pcs./44MW) and Velika Vlajna/ Jastrebinka, Mostar (16 pcs./32 MW). The total foreseen annual output in these three sites is 370 GWh. We installed three additional 50 m masts in Planinica (Mostar), Mokronoge and Srđani (both in Tomislavgrad) out of our own funds.

### 2. Use of Hydro Energy

The research of water resource available in the area where we carry out the activites for which we are licensed, shows that there are sites on rivers suitable for construction of multipurpose reservoirs for power generation, water supply and irrigation with respect and maximum protection of the environment in river basins.

### 3. Kongora Lignite Mine and Thermal Power Plant

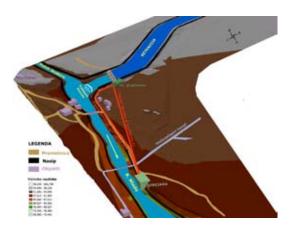
In 2006, the following activities were carried out: The Study on Detailed Additional Geological Research of Kongora Deposit was prepared and reviewed; a land use permit for the research work was obtained; a research license was obtained from the Ministry of Economic Affairs of HB Canton.

According to the Study, the following research work will be carried out: research drilling with coring and excavation; geophysical research work; laboratory testing of lignite and preparation of a study on lignite quality; laboratory testing of physical-mechanical features of lignite and accompanying layers with preparation of a geomechanical study, preparation of a study on classification and categorization of the deposit; hydrological, meteorological and hydrological research.

### **4.GIS Project**

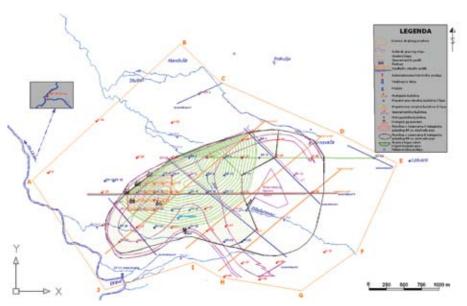
The GIS project will contribute to integration and automatic access to data of different formats from different sources by relational paths and making of complex geoanalyses, automatic calculation of surface and cubic volume within a given area, automatic profile generation etc. on the basis of created network 3D models in the GIS tool environment.



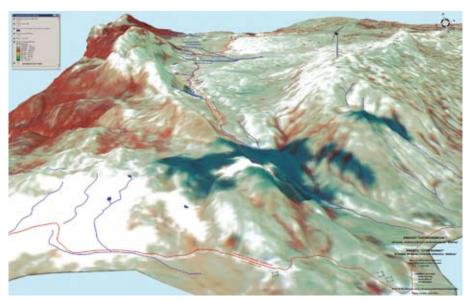


Measurement point Planinica

SHPP Koćuša in 3D model

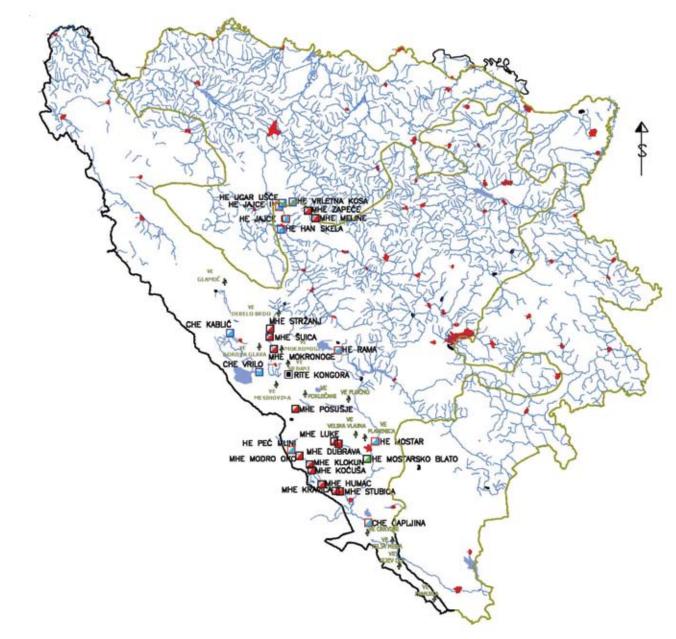


Research area of Kongora deposit



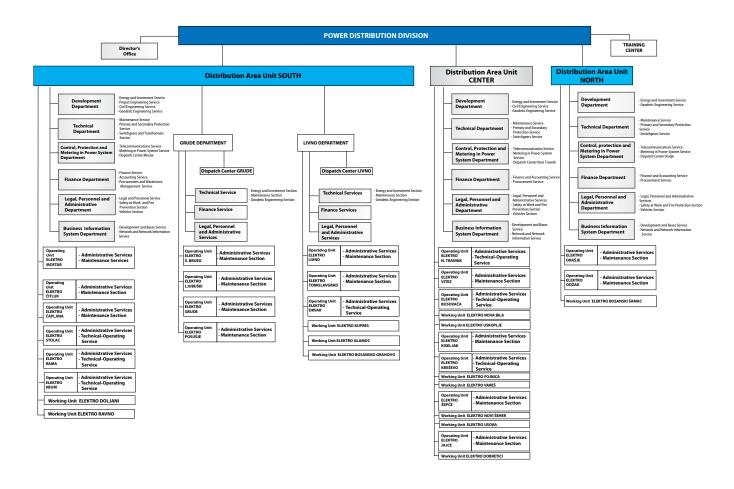
3D model in GIS

### POWER GENERATION DIVISION



Topographical and tabular survey of existing and planned generation facilities of JP EPHZHB

Energy source																	
Basic data	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Large HPPs																	
Power (MWh)	0	0	0	130000	253567	491402	491401	491402	491452	491452	491452	491452	491452	491452	491452	491452	491452
Capacity (MW)	0	0	30	60	164	204	204	204	214	214	214	214	214	214	214	214	214
Small HPPs																	
Power (MWh)	0	0	34374	68201	120963	127483	127483	149983	149991	149991	154571	154571	154571	154571	154571	154571	154571
Capacity (MW)	0	0	9.45	17.32	35.24	38.54	38.54	43.54	45.14	45.14	47.04	47.04	47.04	47.04	47.04	47.04	47.04
Wind turbines																	
Power (MWh)	0	0	367472	629784	727684	1416522	1416522	1416522	1474932	1504132	1533332	1574212	1574212	1574212	1574212	1574212	1574212
Capacity (MW)	0	0	128	218	254	500	500	500	520	530	540	554	554	554	554	554	554
Thermal plants																	
Power (MWh)	0	0	0	0	0	190	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Capacity (MW)	0	0	0	0	0	275	550	550	550	550	550	550	550	550	550	550	550
Total JP EPHZHB																	
Power (MWh)	0	0	401.85	827.99	1102.2	2225.4	5035.41	5057.9	5116.4	5145.6	5179.4	5220.2	5220.2	5220.2	5220.2	5220.2	5220.2
Capacity (MW)	0	0	167.45	295.32	453.24	1017.5	1292.54	1297.5	1329.1	1339.1	1351	1365	1365	1365	1365	1365	1365



# Planned Investment in Power Distribution Division

The investment priority is given to meeting all technical criteria for good and uninterrupted power supply to end customers.

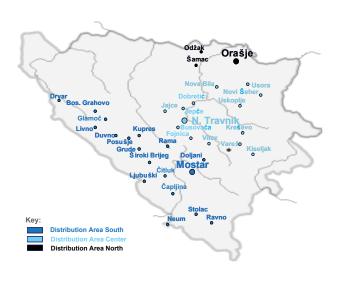
Considerable credit funds have been provided for the next three years. They will be invested in the following:

- 1. Construction and reconstruction of distribution network
- 2. Reconstruction of primary equipment in distribution facilities
- 3. Upgrading of secondary equipment in substations and establishment of metering centers
- 4. Establishment of SCADA system for distribution network

This investment will compensate the lost time for reconstruction and construction of the distribution network and facilities and insure upgrading of the system for control and monitoring of the delivered electricity quality.

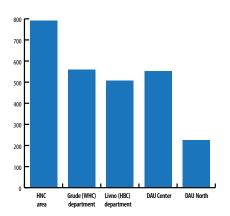
The distribution network destroyed in the war has not been completely reconstructed. It will be necessary to provide considerable funds for return of the refugees and displaced persons.

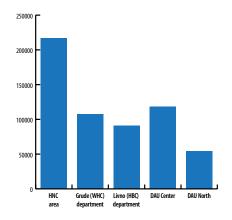
The Distribution Division has been preparing studies on power development per municipalities with the projection up to 2020. They will give the electricity demand and be a basis for better long-term planning of the network and facilities development.

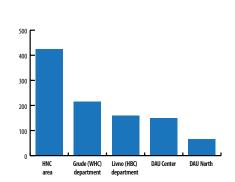


### **Distribution Facilities**

PDD	35/10 kV SS	35 kV line	35 kV TL	10(20)/0.4 kV SS	10,20 and 0.4 kV underground line	10,20 and 0.4 kV overhead line	Installed power	Accepted electricity	Investment
	No	km	km	kom	km	km	MVA	MWh	KM
HNC area	4	0	80.9	792	424	2.143	217.140	483.964	3.047,850
Grude (WHC) department	0	1.1	50.4	560	215	2.750	107.350	282.028	2.015,830
Livno (HBC) department	3	2.4	70.1	507	160	1.608	91.320	159.122	1.162,090
Total DAU South	7	3.5	201.4	1859	799	6501	415.810	925.114	6.225,770
Total DAU Center	3	2.4	53.4	553	149.6	2.764	118.030	287.205	3.742,120
Total DAU North	2	1.8	21.7	226	65.2	885	54.630	99.448	795,770
Total	12	7.7	276.5	2.638	1.014	10.150	588.470	1,311.767	10.763,660



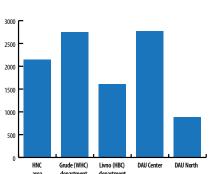




PDD	No 10(20)/0.4 kV SS
HNC area	792
Grude (WHC) department	560
Livno (HBC) department	507
DAU Center	553
DAU North	226
Total	2638

PDD	Installed power (MVA)
HNC area	217.140
Grude (WHC) department	107.350
Livno (HBC) department	91.320
DAU Center	118.030
DAU North	54.630
Total	588.470

PDD	10,20 and 0.4 kV underground line
HNC area	424
Grude (WHC) department	215
Livno (HBC) department	160
DAU Center	149.6
DAU North	65.2
Total	1013.8



_	DAU Center	DAU North	_	0,0	HNC area	Grud depa
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-,-	HNC area	Grude (WHC) department		Livno (HBC) department		DAU Center		DAU North	

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	HNC	Grude (WHC)	Livno (HBC)	DAU Center	DAU North

PDD	10,20 and 0.4 kV overhead line
HNC area	2.143
Grude (WHC) department	2.750
Livno (HBC) department	1.608
DAU Center	2.764
DAU North	885
Total	10.150

PDD	35 kV underground line
HNC area	0
Grude (WHC) department	1.1
Livno (HBC) department	2.4
DAU Center	3.5
DAU North	2.4
Total	9.4

PDD	35 kV overhead line
HNC area	80.9
Grude (WHC) department	50.4
Livno (HBC) department	70.1
DAU Center	53.4
DAU North	21.7
Total	276.5

Key: DAU (Distribution Area Unit); PDD (Power Distribution Division); WHC (West Herzegovina Canton); HBC (Hezeg Bosnia Canton); HNC (Herzegovina-Neretva Canton)

### **Power Supply Division**

The organizational parts of the division are:

- 1. Assistant General Manager's Office
- 2. Supply Area Unit SOUTH
- 3. Supply Area Unit CENTER
- 4. Supply Area Unit NORTH

Supply area units consist of departments and services in charge of direct relations with customers.

The employees of the division are responsible for safe supply and regular collection. On December 31, 2006, there were 182.776 customers.

Number of customers per classes as of December 31	, 2006:
Class	Number of customers
110 kV	3
35 kV	3
10 kV	100
Households	166.518
Other consumption	14.920
Street lighting	1.232
TOTAL	182.776

### Billing and Collection System - HEPBilling

In 2006, the Customer Billing and Information System (HEPBilling) was introduced. The new system covers the complete performance of departments, and billing, collection and metering services.

HEPBilling consists of the following modules:

- Work orders and meters
- Reading and billing
- Collection and ledger
- Treasury operations
- Application administration

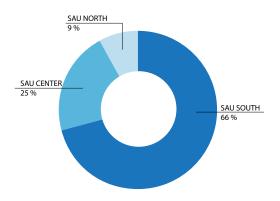
By introduction of this system we have made a move towards improvement of performance in the power supply.

The new system was introduced by stages as follows:

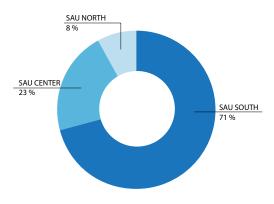
- Supply Area Unit NORTH (Orašje, Odžak and Domaljevac) data set migration at the beginning of February 2006, electricity bills for January issued from the new system;
- Supply Area Unit SOUTH (Široki Brijeg, Grude, Posušje, Ljubuški) data set migration at the beginning of March 2006, electricity bills for February issued from the new system;
- Supply Area Unit SOUTH (Livno, Tomislavgrad, Kupres, Grahovo, Glamoč, Drvar and Čitluk) – data set migration at the beginning of April 2006, electricity bills for March issued from the new system;
- Supply Area Unit SOUTH (Mostar, Čapljina, Stolac, Rama, Neum, Ravno and Doljani) and Supply Area CENTER- data set migration at the beginning of May 2006, electricity bills for April issued from the new system;

Most employees of the Power Supply Division participated in the new system introduction (parallel functioning of the old and new system, collection and up-

### Customers per supply area units



### Accepted electricity (MWh) per supply area units



Key: SAU (Supply Area Unit)

dating of the data base for customers and metering points, learning, and adoption of new procedures and business rules...).

The product of the new system interesting to our customers is a new electricity bill with a filled payment slip. It is put into an envelope and meets the requirement for protection of privacy of our customers. EPHZHB is the first of three power utilities in BiH in sending electricity bills to customers in the manner stipulated by the Law on Protection of Customers.

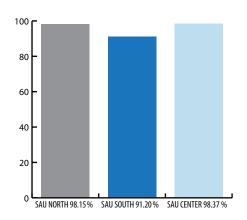
The new information system has improved business processes and increased the collection ratio, and avoided decentralization of old systems. The HEPBilling application also provides better efficiency, monitoring of receivables and collection of outstanding debts.

The management personnel can have a direct access to all data on each customer (kWh consumption, debt, number of unpaid electricity bills, issued dunning letters, power cut orders, data on the meter type, meter inspections, types of seals...) and employee (executed activities and work orders, ongoing activities...). All important business information are easily accessible and integrated. This facilitates decision making at the right time.

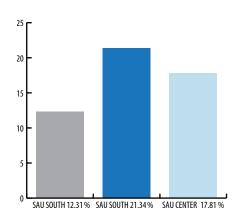
### Performance and Activities in 2006

Notwithstanding all changes in 2006 (organizational changes, new billing and collection system, VAT, new tariffs) the performance was as follows:

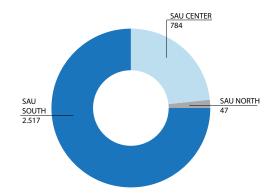
#### Collection ratio at distribution level



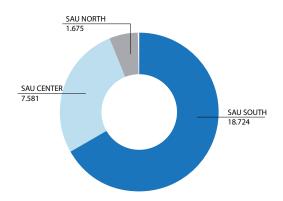
#### Distribution network losses



### Number of suits brought for debt

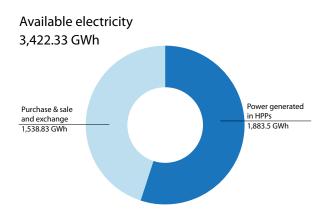


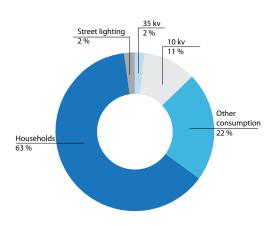
### Number of meter inspections



Power supply and other 35 kV customers 1,485.25 GWh 110/220kV customers 1,875.03 GWh PSPP Čapljina in pump operation 19.32 GWh Transmission losses 69.73 GWh

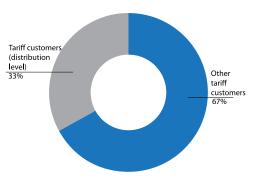
### Billed electricity (MWh) at distribution level in 2006





## **Daily Load Diagram** MAX 600 MIN 500 400 **≥** 300 200 100 1h 2h 3h 4h 5h 6h 7h 8h 9h 10h 11h 12h 13h 14h 15h 16h 17h 18h 19h 20h 21h 22h 23h 24h HOUR

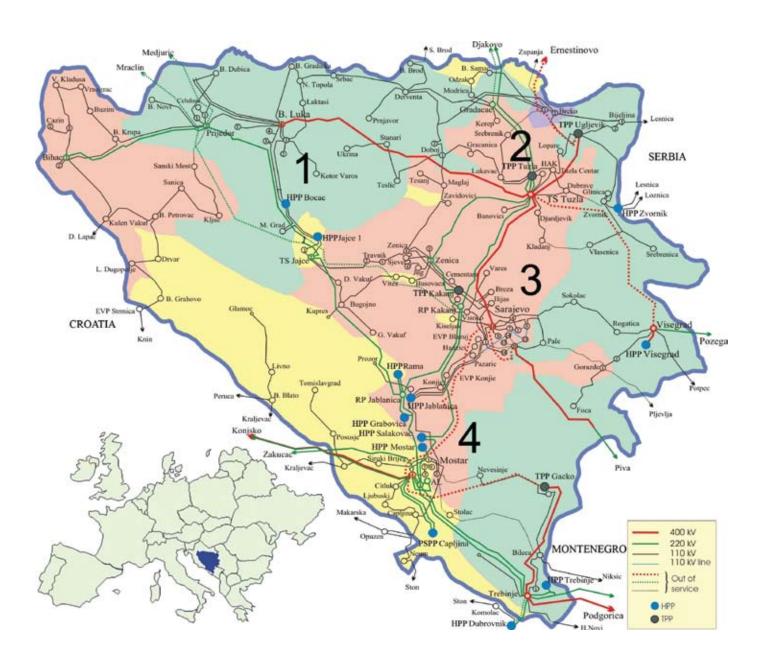
### Electricity accepted by customers at distribution level and other tariff customers



Maxir	Maximum (January 26, 2006) and minimum (May 21, 2006) daily consumption in 2006																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MAX	410	384	386	382	384	397	422	463	482	483	481	482	471	477	485	476	489	503	496	493	491	475	458	441
MIN	344	322	316	306	314	311	319	320	350	358	362	360	358	344	346	332	337	334	330	344	360	369	356	352

Maximum a	Maximum and minimum hourly consumption per months in 2006													
MONTH	1	II	III	IV	V	VI	VII	VIII	IX	Χ	XI	XII		
MAX	503	493	488	453	415	405	423	420	433	623	472	511		
MIN	338	332	317	318	304	304	244	305	304	303	240	331		

### Power Facilities in BiH



### ELEKTROPRENOS BiH Operation areas

- Operation area Banja Luka
- 2 Operation area Tuzla 3 Operation area Sarajevo
- 4 Operation area Mostar

### AREAS UNDER RESPONSIBILITY OF POWER UTILITIES IN BiH

EPBiH ERS EPHZHB

BRČKO DISTRICT BiH

Hydo power plants
 Thermal power plants