



JICA JFY 2010
Energy Policy (B)
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Country Report: Bosnia and Herzegovina

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Bosnia and Herzegovina – basic energy related figures

Population	3,843,000 data for 2007 estimated by the Agency for Statistics of BIH										
Land area, thousand sq km (2009)	51.20 sq km										
GDP / Capita	\$3,941 (nominal) data for 2007 estimated by the Agency for Statistics of BIH \$7,468 (PPP) data for 2007 estimated by the World Bank										
Energy consumption / Capita	Average energy consumption in BH is about 45 GJ per capita, compared with a world average of 70 GJ per capita and OECD average of 236 GJ per capita										
Total Primary Energy Consumption – TPES (average for last five years, negligible deviation)	<div data-bbox="1406 639 1928 884" data-label="Figure"> <p>Dependance on Imported Energy – 32%</p> <table border="1"> <caption>TPES Composition</caption> <thead> <tr> <th>Source</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Coal</td> <td>56%</td> </tr> <tr> <td>Oil</td> <td>26%</td> </tr> <tr> <td>Hydro-RES</td> <td>12%</td> </tr> <tr> <td>Gas</td> <td>6%</td> </tr> </tbody> </table> </div>	Source	Percentage	Coal	56%	Oil	26%	Hydro-RES	12%	Gas	6%
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Fossil fuel:	8,933.0 GWh										
Nuclear:	0.0 GWh										
Hydro:	4,818.0 GWh										
Electricity Market Size	10,450 GWh/year										
Installed Capacity	3,659 MW										
Peak Demand	2,117 MW										
Net Electricity Exporter	1,701 GWh										
Natural Gas Imported	0.31 bcm										
Natural Gas Consumed	0.31 bcm										

A) Energy Resources & Power Sector overview

Basic domestic energy - Coal

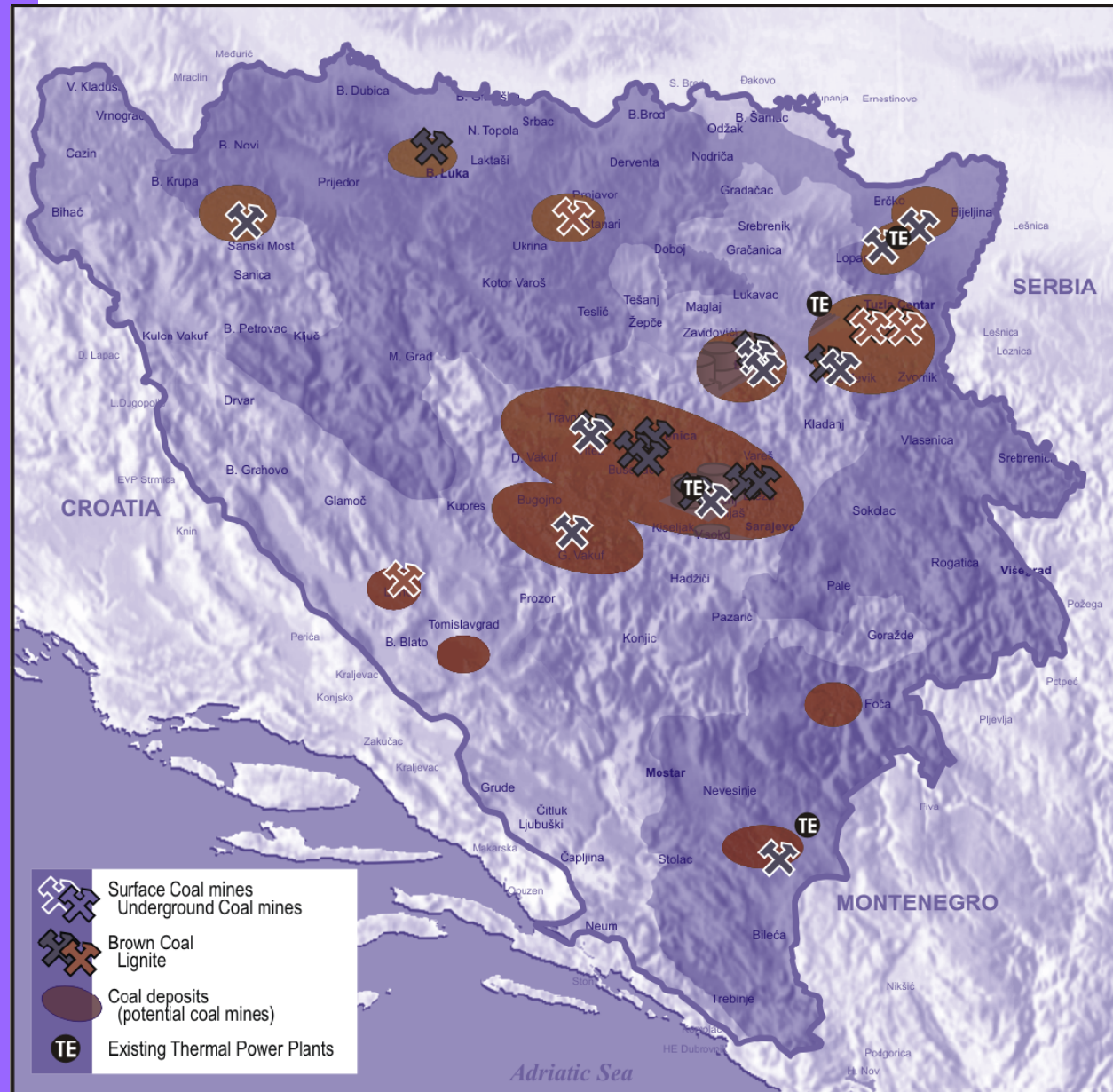
Bosnia and Herzegovina has available significant reserves of lignite and brown coal usable for generation of electricity applying existing (classic) technology or through new energy combustion and transformation technologies.

The existing TPPs in BiH consume average annually around 8 mil.tons of appropriate types and qualities of coal, that surely must be supplied until the end of the existing TPPs lifetime.

Estimates are that aggregate coal reserves in BiH amount:

- a) Brown Coal 1.886 mil.tons
- b) Lignite 3.578 mil.tons
- Total 5.464 mil.tons.

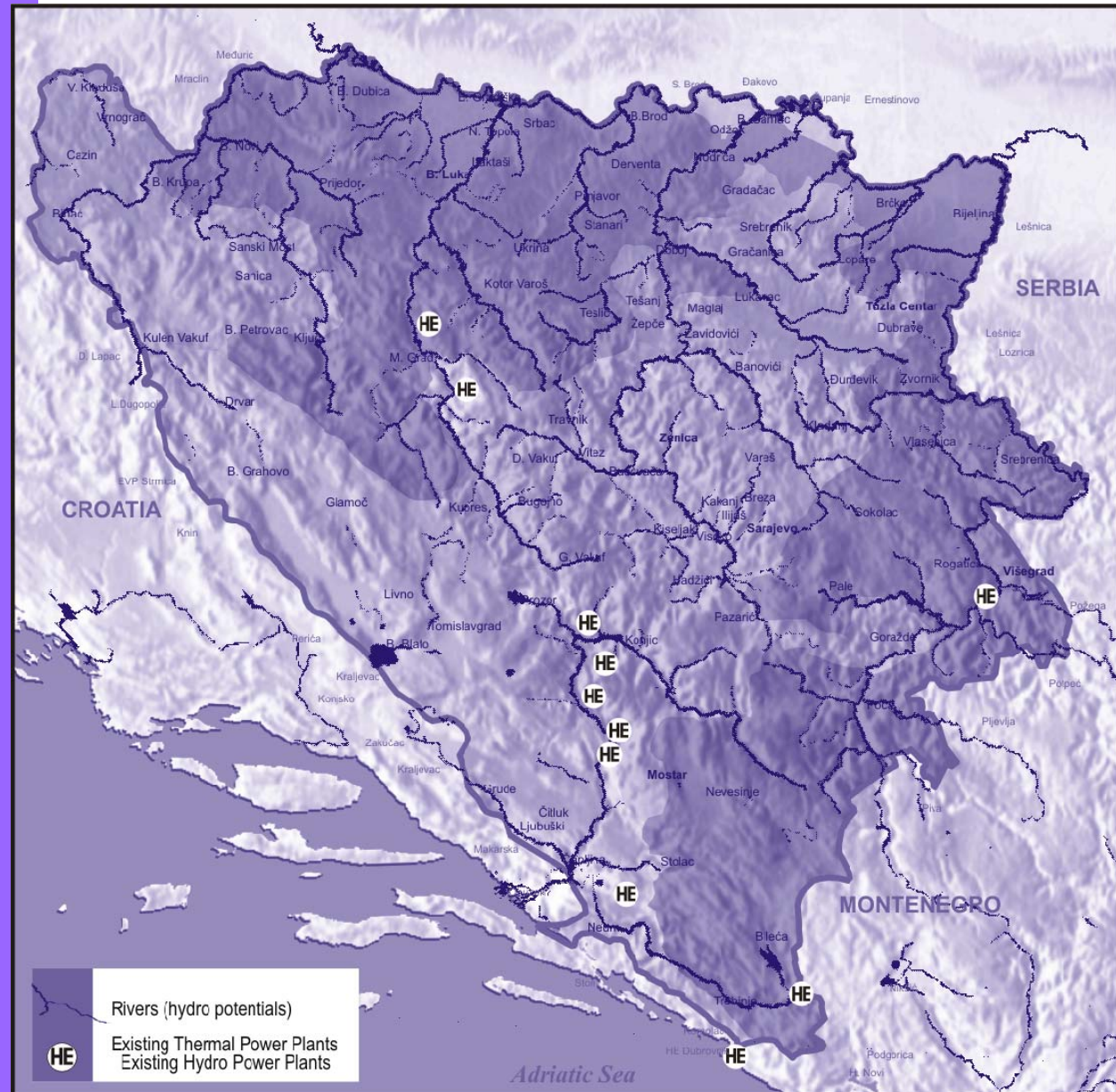
This is preconditions for long-run coal supply to the existing TPPs and for construction of new ones as well. When doing so, there must be taken care of optimal choice of new boilers in thermal power plants according to realistically available qualities and structures of coals.



Basic domestic energy - Hydro

Bosnia and Herzegovina's geography includes fast-flowing mountain streams and powerful rivers that are very well suited for hydroelectricity production. Currently, hydroelectric power stations exist with a generating capacity of around 6,500 MW. Most of these installations are more than 30 years old; modernization of the existing plants is in the pipeline. In 2007 Bosnia generated 6,140 GWh of hydroelectricity, which was a 5 percent generation increase from the previous year (EIA, 2006).

It is estimated that Bosnia has a hydropower potential of 23,400 GWh. Most of the potential is located within the Drina, Neretva and Trebisnjica river basins. The Drina River alone is estimated to have a power generating potential of about 6,000 GWh.



Alternative domestic RES – Small Hydras, Wind, Solar, Geothermal, Biofuels...

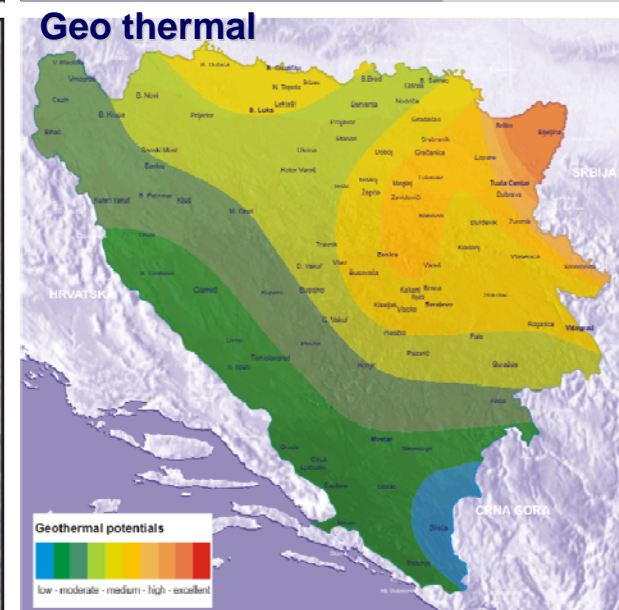
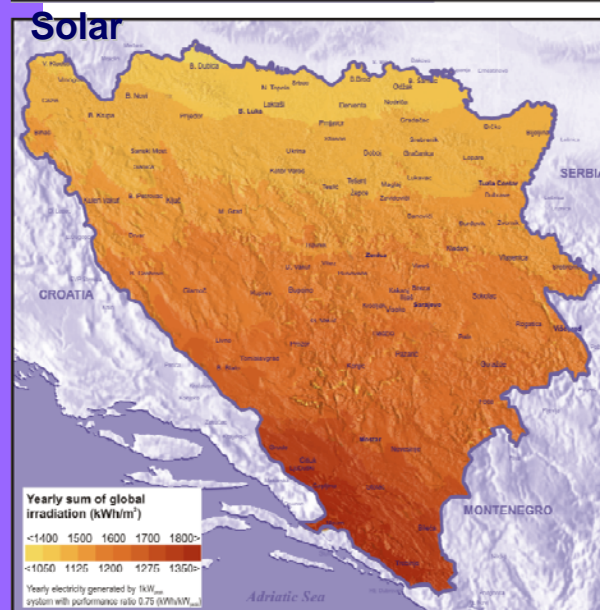
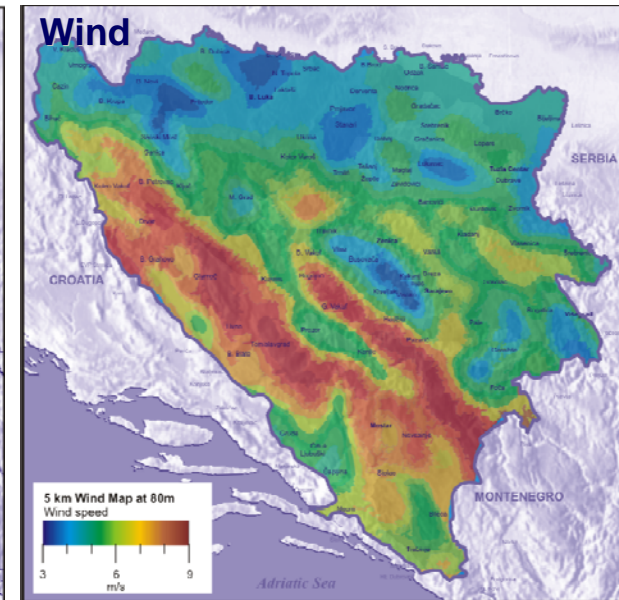
Small Hydras Bosnia has an estimated small hydro power potential of 2,500 GWh/yr., what is the potential to support app. 356 large and small hydroelectric power stations. Since 2006, a total of 120 licenses have been issued for new mini hydroelectric power stations; mini hydroelectric power stations have capacities not in excess of 10 MW.

Wind A wind atlas for Bosnia and Herzegovina was recently established. The assessment shows that Bosnia and Herzegovina has significant wind potential. It is estimated that the total wind power potential capacity is about 2,000 MW, but only 900 MW are usable. This potential has not yet been exploited.

Solar The solar irradiation values in Bosnia and Herzegovina vary accordingly with about 1,240 kWh/m² in the northern region to 1,600 kWh/m² in the southern region. In the southern region, the amount of sunny days can get up to about 270 days per year. The solar potential of the region is approximately 1,900 TWh.

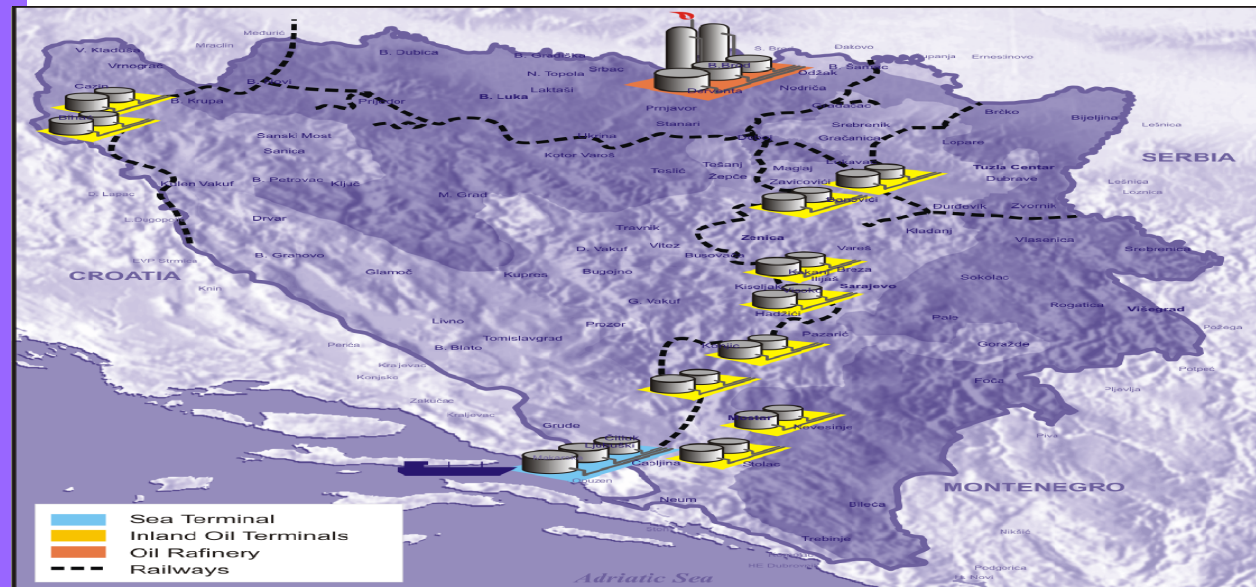
Geothermal energy According to available data, Bosnia & Herzegovina has a geothermal potential of 33 MWth. Due to the low temperatures, however, current activities relating to geothermal energy continue to be limited to exploitation for thermal use.

Biofuels, Biogas etc – negligible implementation, some pilot projects under preparation

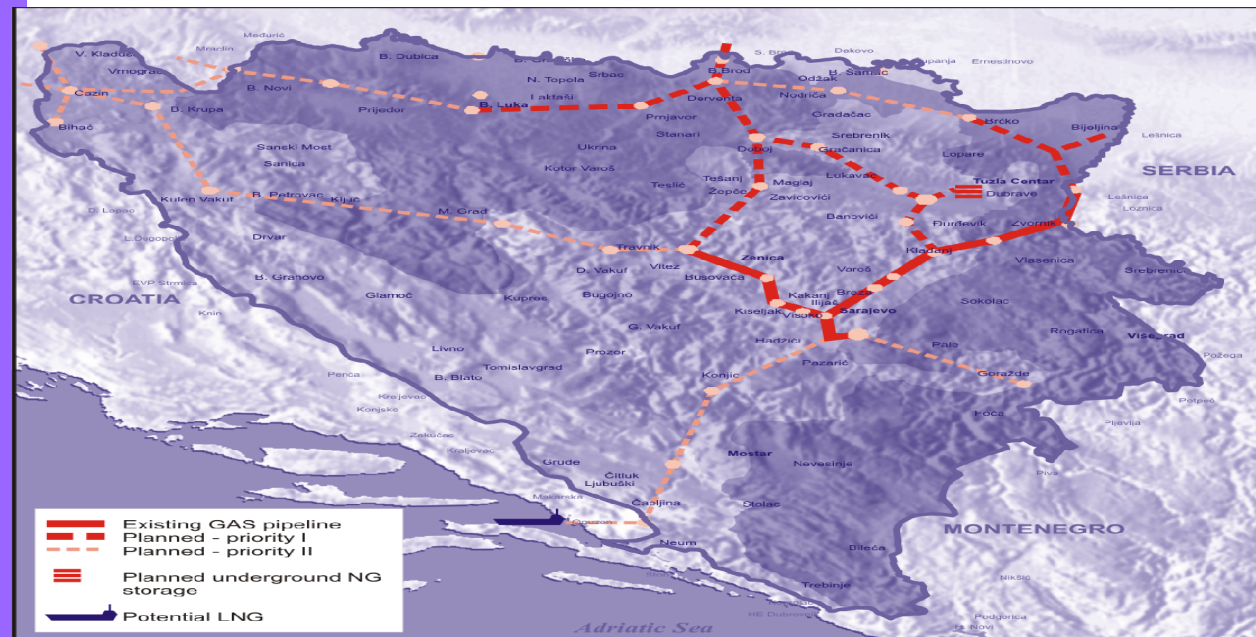


Imported energy – Oil & Gas

Oil sector Bosnia and Herzegovina Gas oil infrastructure comprises the oil products distribution capacities, especially for motor fuels, oils and lubricants. The greatest share of the market is covered by small private distributors. The demand for motor fuels on the domestic market in the present conditions is approximately 1.5 million tons annually. The oil refinery delivers around 500,000 tons to the market, and the rest is imported. Considering that the number of private petrol stations is on the increase and has reached approximately 300 stations, objective estimates suggest that the commercial capacities in BiH market are already oversized. Some preliminary investigations have proved significant Oil reserves in BiH.



Gas All natural gas is imported from the Russian Federation and is transported to BiH via the gas transport systems in Ukraine, Hungary and Yugoslavia. Due to the above mentioned post-war dissolution of the energy system, BiH is facing an absurd situation – in the entire gas transport (over 5000 km) from the gas wells in Siberia to Sarajevo (which is the main consumer in BiH) the intermediaries involved in the internal transport of gas in BiH outnumber the transport intermediaries up to the BiH border. The main features of the gas system in BiH are: length of 191 km and the projected annual capacities of 1 billion m³. The existing leased transport capacities to BiH are 750 million m³/year.

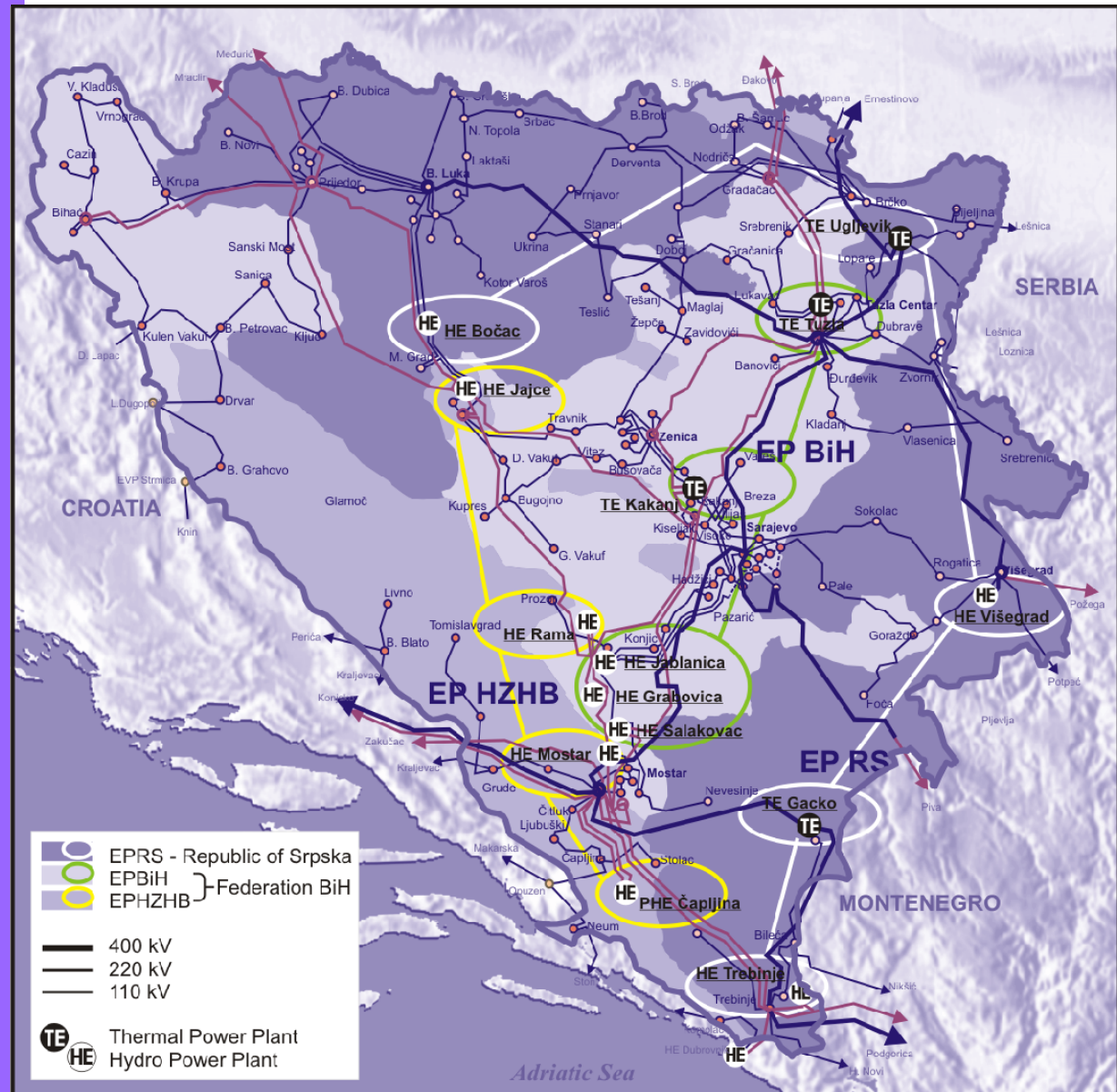


Power Sector

		Total MW	Annual Generation GWh	Fuel
EPBiH SARAJEVO	TE Tuzla	630	2,000	Lignite/Brown
	TE Kakanj	305	1,000	Brown
	HE Jablanica	165	750	Hydro
	HE Grabovica	110	300	Hydro
	HE Salakovac	210	350	Hydro
		1,420	5,000	
EPHZHB MOSTAR	HE Jajce 1&2	65	400	Hydro
	HE Rama	160	650	Hydro
	HE Mostar	75	250	Hydro
	PHE Čapljina	430	200	Hydro
	HE Pč. Mlini	30	100	Hydro
		760	1,600	
FEDERATION BiH		2,279	7,400	
		MW (installed)	Generation (Average Annually)	

		Total MW	Annual Generation GWh	Fuel
EP RS BANJALIKA	RTE Gacko	300	950	Lignite
	RTE Ugljevik	300	1,250	Brown
	HE Bočac	110	300	Hydro
	HE Višegrad	315	900	Hydro
	HE Trbinje 1&2	175	450	Hydro
HE Dubrovnik (SPS)	210	500	Hydro	
		1,417	4,350	
REPUBLIC OF SRP SKA		1,417	4,350	
		MW (installed)	Generation (Average Annually)	

BOSNIA HERZEGOVINA		3,696	11,750	
		MW (installed)	Generation (Average Annually)	

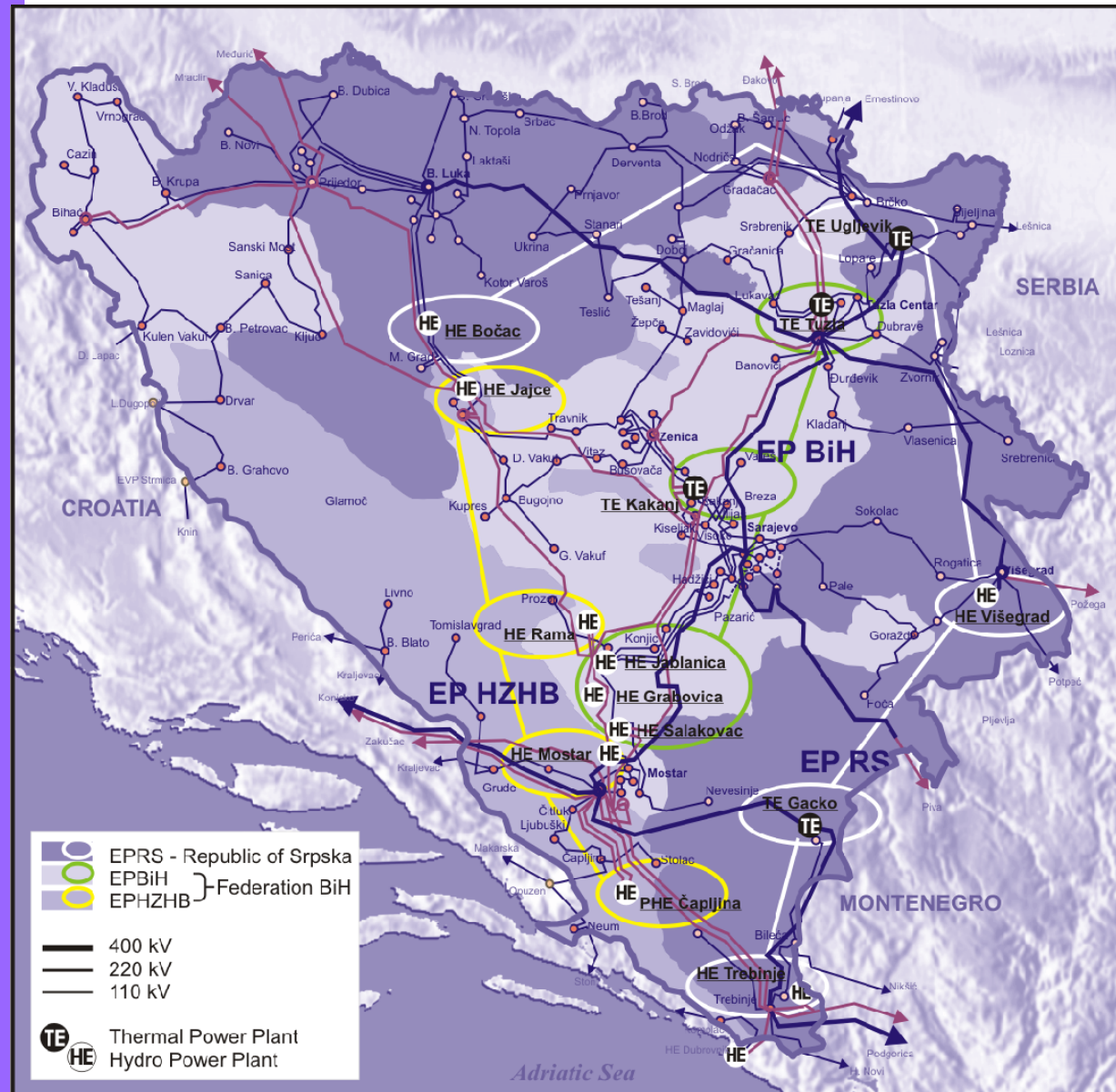


Power Sector – current status

		Total MW	Annual Generation GWh	Fuel
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		1,420	5,000	
EPHZHB MOSTAR	HE Jajce 1&2	85	400	Hydro
	HE Rama	160	650	Hydro
	HE Mostar	75	250	Hydro
	PHE Čapljina	430	200	Hydro
	HE Pč. Mlini	30	100	Hydro
		780	1,600	
FEDERATION BiH		2,279	7,400	
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B) Energy Policy / Strategy

Energy Policy – Demand/Generation scenariosc

Diagram:
Total primary energy supply in BiH

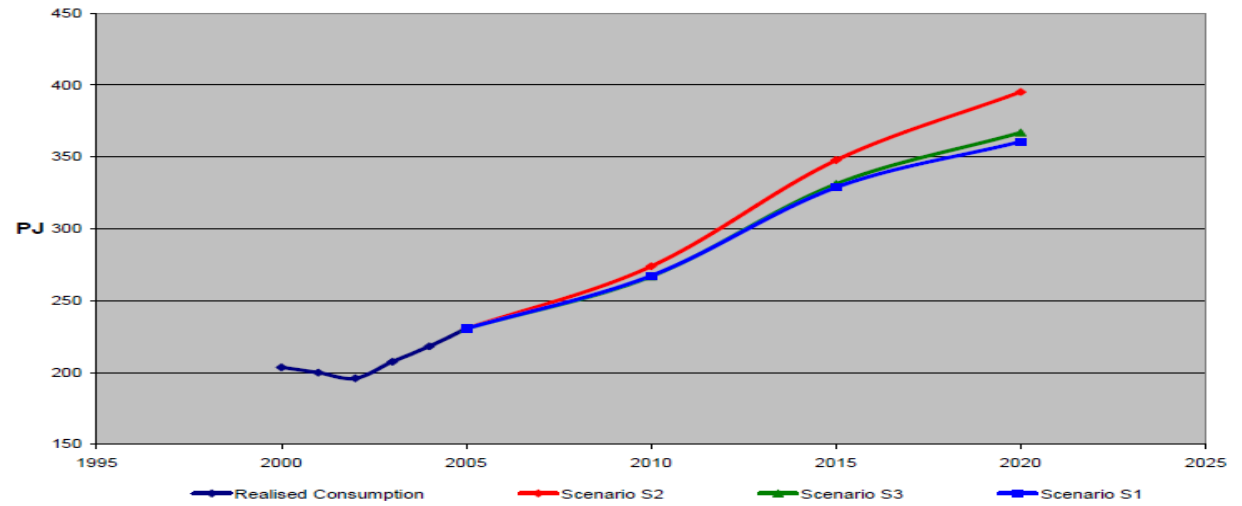
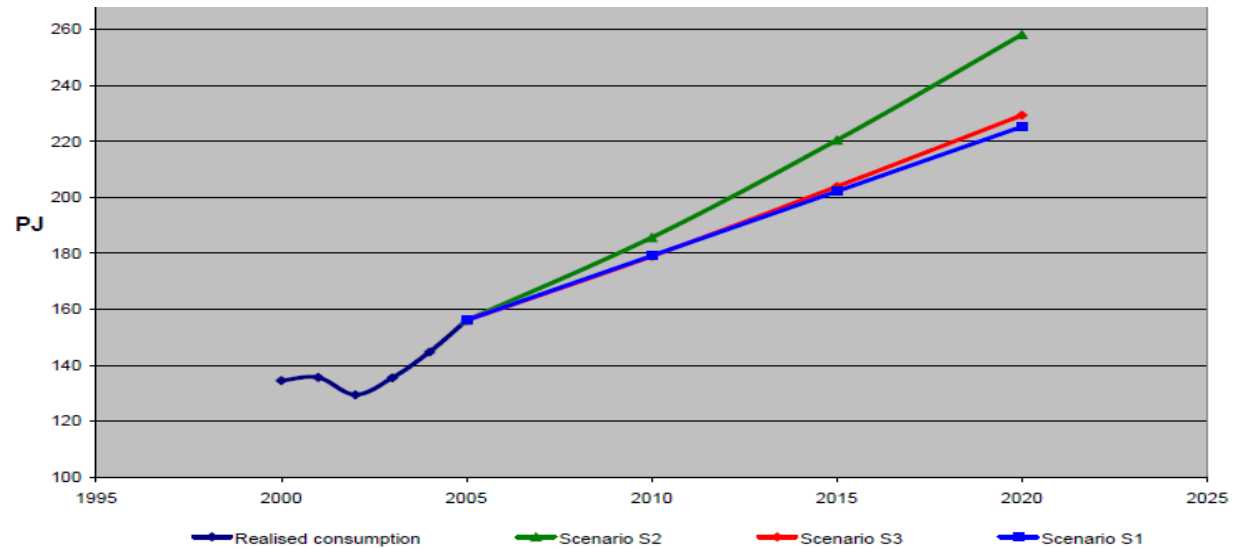
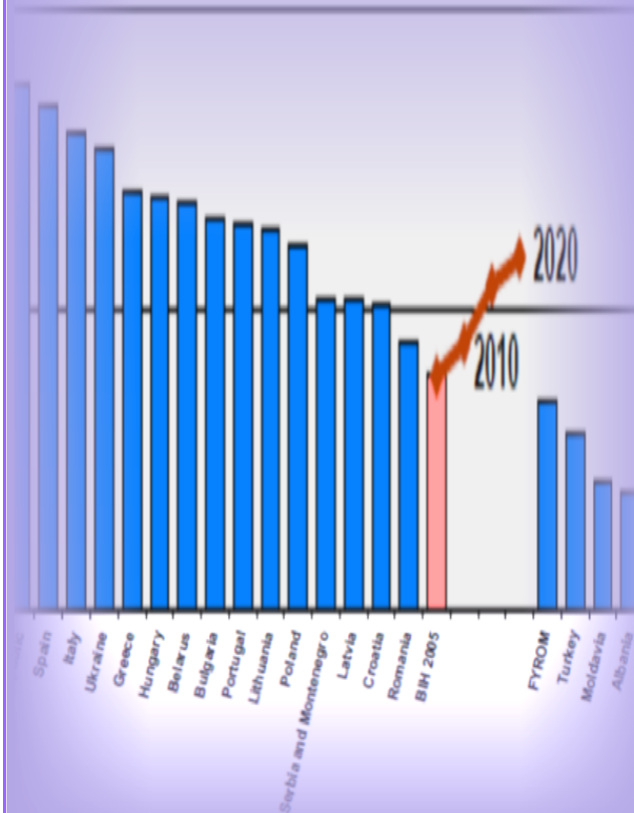


Diagram:
Total final energy demand in BiH



Energy Policy – basic thesis of the BH Energy Policy/Strategy (summary)



- Rather complex political/administrative constitution which is affecting all segments of its economy, incl. Energy (Power) Sector:
- Energy policy should be just one segment of the overall national economy policy (harmonized with other sectors):
- Bosnia and Herzegovina is in the middle of the EU integration process - “EU pressure” is the key driving force in all internal reforms, strategies & policies, incl. Energy sector:
- Bosnia and Herzegovina has promising energy resources and, there is one excellent opportunity to get the status of relevant regional energy exporter:
- Almost two thirds of total Power production was based on coal. This ratio is likely to remain, but new TPP technologies must be utilized:
- Bosnia and Herzegovina has also significant RES potentials which were not seriously utilized, so far. New Tariff policy is the key prerequisite to this. New encouraging tariffs are on the horizon:

So , the major “concern” about Energy policy in Bosnia and Herzegovina, in the near future, would be – how to keep and increase certain Power overbalance?

Thank you !

ありがとうございます



M. Srdanovic, BiH

Tokio, 11.May 2010.