

PICTURE STORY

Balkan energy and the future of Bosnia

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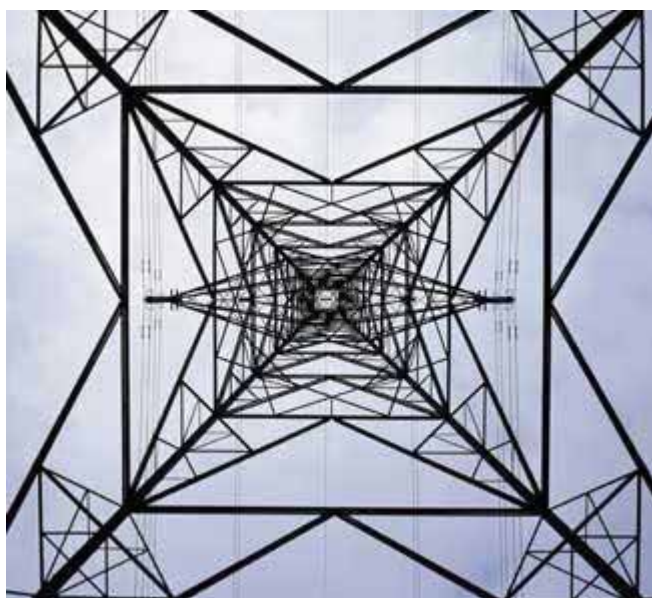
The collapse of much of its industry as a result of both war and transition means that today Bosnia's energy consumption is only about 45 Giga-Joule per capita, compared with an OECD average of 236. At the same time, Bosnia's geography, water resources and coal reserves mean that it is well placed to produce energy, both thermal (from coal) and hydro (from water). The potential to dramatically expand domestic energy production makes Bosnia a central player in future energy planning in South Eastern Europe.



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Bosnia and Balkan energy demand



Overhead power line

The collapse of much of its industry as a result of both war and transition means that today Bosnia's energy consumption is only about 45 GJ *per capita*, compared with an OECD average of 236.¹ At the same time, Bosnia's geography, water resources and coal reserves mean that it is well placed to produce energy, both thermal (from coal) and hydro (from water).² The potential to dramatically expand domestic energy production makes Bosnia a central player in future energy planning in South Eastern Europe.

which at 17 percent of its production was the highest share in the region. By 2006 exports stood at 2,500 GWh.³

In 2004, Bosnia already exported more than 2,000 GWh (see table),

Bosnia has thus become one of only three energy exporters in the Balkans (together with Romania and Bulgaria).⁴ All the other countries in South East Europe are dependent on energy imports. In 2004, Macedonia imported 16 percent of its energy, and Croatia 23 percent.

Table: main energy exporters in the Energy Community region in 2004⁵

	Net export GWh	Production GWh	Consumption GWh	Installed capacities MW
Bulgaria	5,878	41,538	35,660	12,130
Bosnia	2,084	12,600	10,516	4,062
Romania	1,188	51,934	50,746	16,473
Albania	- 479	5,368	5,847	1,564
Macedonia	- 1,176	6,213	7,389	1,510
Serbia (incl. Montenegro and Kosovo)	- 2,015	38,401	40,416	9,214
Croatia	- 3,662	12,432	16,094	3,746
Total	1,818	168,486	166,668	48,699

¹ Josko Jenko, *Bosnia and Herzegovina Power Sector Development*, Background Paper, presented at World Bank – 4th Poverty Reduction Strategies Forum, Athens, June 26-27, 2007, p. 4.

² Josko Jenko, *Bosnia and Herzegovina Power Sector Development*, Background Paper, presented at World Bank – 4th Poverty Reduction Strategies Forum, Athens, June 26-27, 2007, p. 4: “Coal deposits in BH are considerable, estimated at 10 x 10⁹ tonnes.”

³ Bosnia and Herzegovina State Electricity Regulatory Commission, “Osnovni elektroenergetski pokazatelji Bosne i Hercegovine”, see: <http://www.derk.ba/default.aspx?195>.

⁴ Actually Bosnia exported in net values 2,165.3 GWh. Bosnia and Herzegovina State Electricity Regulatory Commission, “Osnovni elektroenergetski pokazatelji Bosne I Hercegovine”, see: <http://www.derk.ba/default.aspx?195>.

⁵ SEETEC Consortium SNC-Lavalin Inc., in association with Manitoba Hydro, “Study of the Obstacles to Trade and Compatibility of Market Rules”, Vol. 1, Main Report, March 2006.

The crisis of coal mining in the Balkans



Stanari coal mine near Doboj in Republika Srpska

The whole coal mining sector in the Balkans is “characterized by high costs and staffing levels above commercial norms.”⁶

Bosnia’s coal production experienced a sharp decline during the war. Output in 1990 had been 18 million tonnes. In 2004, it stood at 8.3 million.

The World Bank estimated that to remain competitive the Bosnian coal industry would have

to reduce its workforce from 15,000 to 3,000 miners.⁷ This, it argued, was a regional problem: “around 100,000 jobs would need to be shed in order for the coal industry in South East Europe to be viable.”⁸

The 2004 World Bank paper estimates current and future employment in the coal industry:

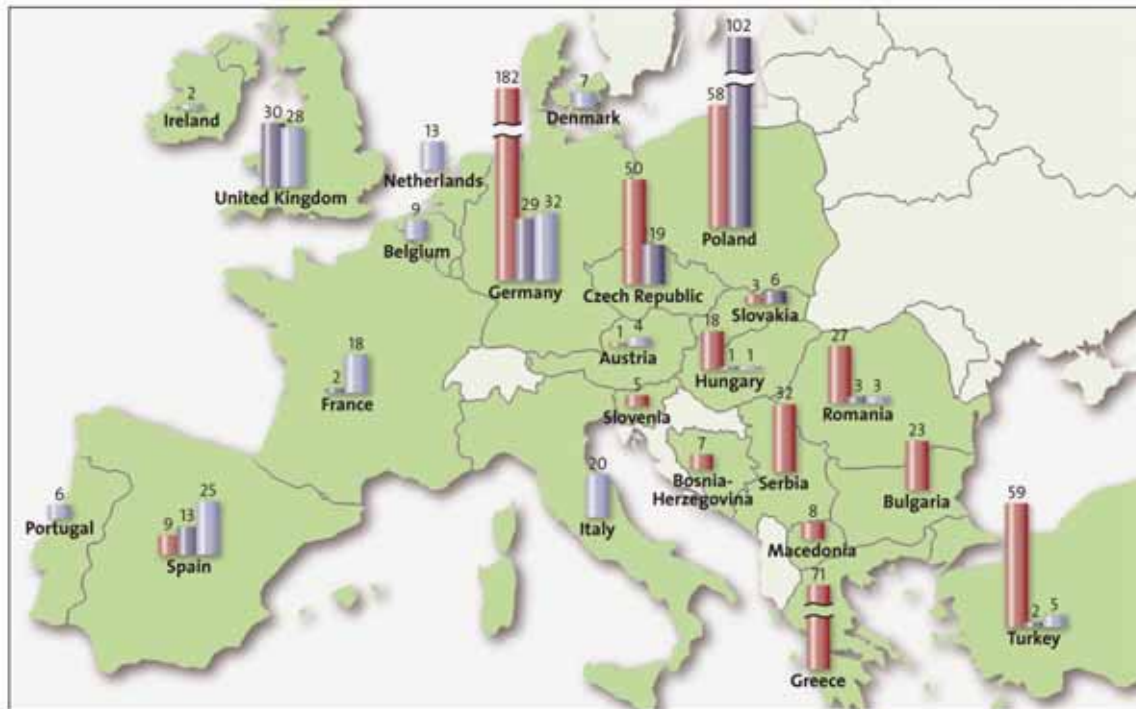
	Current employment	labor force in viable industry	required reduction
Bosnia	15,000	3,000	80 percent
Bulgaria	40,000	5,000	80 percent
Romania	40,000	7,000	83 percent
Serbia	25,000	8,000	68 percent

⁶ Josko Jenko, “Bosnia and Herzegovina Power Sector Development”, Background Paper, presented at World Bank – 4th Poverty Reduction Strategies Forum, Athens, June 26-27, 2007, p. 4.

⁷ David Kennedy and John Besant-Jones, *Framework for Development of Regional Energy Trade in South East Europe*, Energy and Mining Sector Board Discussion Paper No. 12, Washington, March 2004, p. 22.

⁸ David Kennedy and John Besant-Jones *Framework for Development of Regional Energy Trade in South East Europe*, Energy and Mining Sector Board Discussion Paper No. 12, Washington, March 2004, p. 6.

Coal and European energy



Coal production in Europe
Production of lignite (red), hard coal (dark grey) and imports (light grey) in Mt

"The EU's power supply system is currently based on a mix of nuclear energy, coal, gas and hydroelectric power. In the enlarged EU coal now accounts for about 32 percent of the total primary energy needs of the electricity suppliers."

Germany is presently by far the largest coal consumer in the EU, with Poland far the second-largest. A recent (2007) study commissioned by Euracoal on *The Future Role of Coal in Europe* notes that in Europe today coal remains indispensable to power generation:

"Lignite and hard coal cover approximately 1/6 of primary energy consumption in the European Union (EU 25). About 2/3 of consumption are covered by domestic production. In the sector of power generation coal is indispensable." (2007)

Turning around a Bosnian coal mine



Stanari mine, west of Doboj in Republika Srpska

In May 2005 energy trader EFT acquired 72 percent of the Stanari mine and a 30 year concession. The following year, the company bought the remainder of the shares. The granting of a concession to a private investor was a novelty in the Western Balkans, where most coalmines are still owned by public companies. Things started to change almost immediately.

A new director was hired and the company took on more qualified personnel. EFT made investments in machinery totalling € 5 million in 2005.⁹ Production methods changed as a result.¹⁰ In 2004, annual output of coal had been less than 200,000 tonnes. In 2006, it was able to extract about 1,600 tonnes of coal per worker, compared to an average figure across Bosnian coalmines of 500 tonnes.¹¹ In 2007, output was 800,000 tonnes of coal.

Table: Output in Stanari coalmine 1998-2007¹²

Year	Coal (tonnes)	Overburden (m ³)
1998	122,000	
1999	60,000	
2000	51,800	165,000
2001	38,251	120,000
2002	104,000	150,000
2003	152,000	276,000
2004	198,200	780,000
2005	268,885	1,618,000
2006	512,115	4,130,000

⁹ This was invested in 7 dumpers for removal of overburden, 2 hydraulic dredging machines, 1 grader, 1 bulldozer, 3 hydraulic dredgers for excavation of lignite, 8 Kamaz trucks for moving lignite to separation unit and repair of the BTO (bager-transport-odlaganje).

¹⁰ The previous management had allowed the cut-off-rate (the amount of cubic meters of earth removed to reach one ton of coal in open cast mining) to decline for years. As a result the excavation wall was too steep and there was a constant threat of earth-slides.

¹¹ The director of the Kreka mines in Tuzla hoped to extract 2.7 million tonnes of coal with 4,004 employees in 2007. Stanari plans to achieve the same output in 2011 with 600 miners. See: <http://kreka.inet.ba/> "U rudnicima 'Kreka' u Tuzla novi nadzorni odbor".

¹² Sources: EFT Group, "Republika Srpska – Stanje i osnovna problematika poslovanja preduzeca iz oblasti rudarstva", without date, and Vladimir Bijelic (1998-1999).

In 2004 the Stanari mine had employed 302 miners. It had struggled to pay an average wage of 413 KM. By 2007 employment has risen to 372 workers, and the average wage had grown to 716 KM.¹³

¹³ ESI request for information to EFT Group, answer per email 27 November 2007.

War, reconstruction and Bosnian energy



Stanari coal mine in Dobo

Of the total installed capacity to produce energy in Bosnia in 1990 (4,000 MW), war had destroyed 56 percent. Sixty percent of the transmission grid had also been destroyed.¹⁴

However, by 2002 Bosnia's energy sector had surpassed its pre-war capacity as a result of a huge donor mobilisation.¹⁵ The destruction of transformer stations in Croatia and in the Herzegovina during the

war continued to hinder both regional energy trade and trade with the EU. This was also overcome by 2004.

¹⁴ 1 MW equals 1,000 kilowatt (kW). 1 gigawatthour (GWh) equals 1,000 MWh.

¹⁵ Austrian Energy Agency, *Energy market actors. Electricity market. Electricity Sector Overview*, Information is based on 2002 numbers. See: <http://www.energyagency.at/enercee/bih/energymarketactors.htm>.

Energy state building in Bosnia (2000-2007)



Elektroprivreda HZHB

In 2002, the governance structure of the Bosnian energy sector remained chaotic.

There were three separate power producing utilities – the Sarajevo-based *Elektroprivreda* BiH, the Mostar-based *Elektroprivreda* HZHB and the Banja Luka-based *Elektroprivreda* RS – divided along ethnic lines. There was uncertainty over the ownership of the transmission lines. It was unclear who regulated the sector, and who could be a counterpart for potential investors. In 2000 ESI had noted that

“international funding during the last years has often had the unintended effect of consolidating the ethnically divided war economies. A more sophisticated use of international influence could now ensure that the regulatory frameworks established for key industries advance the broader political and economic objectives of the peace process. Telecommunications and electricity, like coal and steel in the 1950s in Western Europe, are a natural starting point for functional integration of the Bosnian state.”¹⁶

At the time ESI recommended the establishment of strong, autonomous agencies at the state level to regulate these network industries:

“These would have power to issue licenses for the use of common networks (communications transmitters, electricity transmission grids) and to attach conditions to those licenses, including ensuring that service providers comply with the principles of a common market, and that they are financially transparent... International leadership is needed to accelerate the restructuring (unbundling) of these industries, splitting their functions among separate legal entities. Ambitious deadlines for restructuring should be set down at the Peace Implementation Council. Creating autonomous public corporations to manage and operate network facilities should be further investigated.”¹⁷

In fact, in recent years all of this has happened, changing the institutional landscape in the Bosnian energy sector dramatically.

In 2004 a state regulatory commission became operational.¹⁸ The whole Bosnian electricity network was united in 2006 into a state-level Transmission Company (Transco), based in

¹⁶ ESI report, *Taking On The Commanding Heights. Integration Of Network Industries As A Tool Of Peace Building. A Proposal For The Peace Implementation Council*, 2000.

¹⁷ ESI report, *Taking On The Commanding Heights. Integration Of Network Industries As A Tool Of Peace Building. A Proposal For The Peace Implementation Council*, 2000. See also Annex.

¹⁸ Regulatory Commission for Electricity in Federation of Bosnia and Herzegovina, in Mostar (<http://www.ferk.ba>) and Regulatory Commission for Electricity in Republic of Srpska in Banja Luka (<http://www.reers.ba>), Bosnia and Herzegovina State Electricity Regulatory Commission in Tuzla, see: <http://www.derk.ba>.

Banja Luka.¹⁹ Transco is monitored by an independent system operator on the state-level based in Sarajevo.²⁰ Since 2004, an energy department exists in the State Ministry of Foreign Trade and Economic Relations. The power utilities are also restructuring (“unbundling”): the RS power utility (EPRS) has already created five distinct regional energy distributing companies, which become independent suppliers in the energy market.²¹

¹⁹ Based on the TRANSCO Law of Bosnia and Herzegovina (Official Gazette BiH 35/04).

²⁰ Independent System Operator of Bosnia and Herzegovina (ISO BiH), based on the ISO Law of Bosnia and Herzegovina (Official Gazette BiH 35/04). See: www.nosbih.ba.

²¹ Elektrodoboj has recently announced a project to build hydro-power stations in cooperation with foreign investors. The heating plant of Doboj could tomorrow become an independent energy provider, if it installs a steam turbine in its plant.

Energy and functional integration in the Balkans (2001-2007)



Martti Ahtisaari

In 2001 another ESI report on the future of the Stability Pact, produced under the supervision of Martti Ahtisaari, recommended a process of *functional integration* on the regional level focusing on energy:

“A concrete proposal is to commit Western donors substantially to increase support to regional governments in reforming their energy sectors in return for a commitment by these governments to create a genuine common market, integrated with that of the European Union... over the medium term, substantial new investments will need to be made throughout the region to satisfy the demand for new energy generation capacity and to replace old capacity. The existence of regional markets and

structures for co-operation will determine the viability of such investments... Successful functional integration in the energy sector could provide a model for regional co-operation in other sectors.”²²

In 2002, South East European countries agreed to a European Commission strategy outlining the principles and institutional requirements for a regional electricity market. They then adopted a memorandum, based on the new EU electricity and gas directives from 2003, and signed an international treaty establishing an Energy Community in South East Europe in October 2005.

The treaty, which entered into force on 1 July 2006, mandates far-reaching reforms:

“to create a single regulatory space for trade in Network Energy that is necessary to match the geographic extent of the concerned product markets; enhance the security of supply of the single regulatory space by providing a stable investment climate in which connections to Caspian, North African and Middle East gas reserves can be developed, and indigenous sources of energy such as natural gas, coal and hydropower can be exploited; improve the environmental situation in relation to Network Energy and related energy efficiency, foster the use of renewable energy, and set out the conditions for energy trade in the single regulatory space.”²³

The Energy Community has thus turned the energy market in the Balkan region into a large integrated market governed by EU standards. It defines:

“The ‘*acquis communautaire on energy*’, for the purpose of this Treaty, shall mean (i) the Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity, (ii) the Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas, and (iii) the Regulation 1228/2003/EC of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity.”

²² ESI Report, *Democracy, Security And The Future Of The Stability Pact For South Eastern Europe*, April 2001.

²³ Treaty Establishing the Energy Community ECS, July 2006.

Benchmarking energy sector reform



Energy Community

A new Energy Community secretariat was set up with the task to benchmark progress in the energy sector in different countries. Sometimes this leads to surprising results:

Benchmarking electricity sector reform (Energy community secretariat)²⁴

	Bosnia	Bulgaria	Croatia	Romania	Serbia
Public Service Obligation and Customer Protection	1	2	2	2	2
Monitoring of Security of Supply	3	3	3	3	2
Technical Rules	3	3	3	3	1
Generation	2	3	3	2	3
Unbundling Provisions and Access to Accounts	2	2	3	2	2
Third Party Access	3	3	3	3	2
Market Opening	3	3	3	3	0
Cross Border Trade Mechanism	1	1	1	2	1
Total	18	20	21	20	13

0 = process has recently started, 1 = some provisions are available, 2 = some provisions are missing, 3 = all provisions are available

²⁴ Energy Community Secretariat, Implementation of the Treaty Status as of June 2007 – electricity, Vienna, 28-29 June 2007.

The need for new investment



Energy Community

A World Bank report noted in 2004:

“Investment over the past 10-15 years has been limited, with the average age of capacity now in excess of thirty years, and some plants are over forty years old. Capacity availability is poor by international standards and reliability is declining. In poor hydrological years, parts of the region are unable to meet their energy needs, with resultant load shedding.”²⁵

At a regular session held in Athens in April 2007 participants of the South East European Energy Community “expressed their concern about the level of investment in the energy sector.”²⁶ As the economies of the region recover, energy demand has grown. Almost all the power stations in the region were also constructed during the communist era and do not comply with current environmental standards. Under EU regulations, these plants must be refurbished or replaced.

Its central geographic location means that Bosnia and Herzegovina is very well placed to supply its north-western neighbours (Croatia and Slovenia), as well as those to the south east (Montenegro, Serbia, Albania, Greece). A recent summary of projects in the field of power generation identified a total of 5,156 MW in projects.²⁷ The analytical newsletter “Energy in Eastern Europe”, lists in its recent publication 28 projects that are currently ongoing or seriously planned in Bosnia and Herzegovina.²⁸

Table: Energy consumption forecasts for SEE (2005-2015)²⁹

Country	GWh 2005	GWh 2015
Romania	49,191	61,615
Bulgaria	38,802	45,924
Serbia	37,282	42,592
Croatia	16,532	22,533
Bosnia and Herzegovina	10,471	13,813
Albania	6,760	9,483
Macedonia	7,112	9,061
Montenegro	4,358	4,506
SEE total energy demand	170,507	209,528

²⁵ David Kennedy and John Besant-Jones, *Framework for Development of Regional Energy Trade in South East Europe*, Energy and Mining Sector Board Discussion Paper No. 12, Washington, March 2004, p. 17.

²⁶ Energy Community, Conclusions 10th Athens Forum 24-25 April 2007, http://www.energy-community.org/portal/page?_pageid=34,65297&_dad=portal&_schema=PORTAL&&p_new_id=201.

²⁷ Nezavisni operator sistema u Bosni i Herecegovini, Indikativni plan razvoja proizvodnje 2007.-2016. godine, Sarajevo, November 2006, p. 22.

²⁸ Platts – Energy in East Europe, Issue 127, November 23, 2007 – New power generation projects.

²⁹ SEETEC Consortium SNC-Lavalin Inc., in association with Manitoba Hydro, “Study of the Obstacles to Trade and Compatibility of Market Rules”, Vol. 1, Main Report, March 2006.

Recommended literature



Stanari coal mine, Bosnia

- Austrian Energy Agency, [Energy market actors. Electricity market. Electricity Sector Overview](#), 2002.
- BiH Government, [Electricity Policy Statement](#), 2000.
- Bosnia and Herzegovina [State Electricity Regulatory Commission](#) in Tuzla.
- David Kennedy and John Besant-Jones, [Framework for Development of Regional Energy Trade in South East Europe, Energy and Mining Sector](#) Board Discussion Paper No. 12, Washington, March 2004
- Energy Community Secretariat, [Implementation of the Treaty Status as of June 2007 – electricity](#), Vienna, 28-29 June 2007
- Energy Community, [Bosnia and Herzegovina – Country Report 2006](#).
- Energy Community, [Conclusions 10th Athens Forum 24-25 April 2007](#).
- Energy Community, [Creating the power and confidence to rebuild](#), 2006.
- ESI Report, [Democracy, security and the future of the Stability Pact for South Eastern Europe](#), April 2001
- ESI Report, [Taking On the commanding heights. Integration of network industries as a tool of peace building. A proposal for the peace implementation council](#), 2000.
- EURCOAL, [Coal & Europe](#), 2004.
- EURCOAL, [The future role of coal in Europe](#), 2007.
- [Independent System Operator of Bosnia and Herzegovina \(ISO BiH\)](#), based on the ISO Law of Bosnia and Herzegovina (Official Gazette BiH 35/04).
- Josko Jenko, [Bosnia and Herzegovina Power Sector Development, Background Paper](#), presented at World Bank – 4th Poverty Reduction Strategies Forum, Athens, June 26-27, 2007.

- [Nezavisni operator sistema u Bosni i Herecegovini, Indikativni plan razvoja proizvodnje 2007.-2016. godine](#), Sarajevo, November 2006.
- Platts – Energy in East Europe, Issue 127, November 23, 2007 – New power generation projects.
- [Regulatory Commission for Electricity in Federation of Bosnia and Herzegovina](#) in Mostar
- [Regulatory Commission for Electricity in Republic of Srpska](#) in Banja Luka.
- SEETEC Consortium SNC-Lavalin Inc., in association with Manitoba Hydro, [Study of the Obstacles to Trade and Compatibility of Market Rules](#), Vol. 1, Main Report, March 2006
- [TRANSCO Law of Bosnia and Herzegovina \(Official Gazette BiH 35/04\)](#).