

Balkan Energy Overview



**Balkans
Energy
Prospect**

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Introduction

The Western Balkan countries (Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro and Serbia – WB6) must comply with specific EU regulations, since they are aspiring to join the European Union. Among other pressing issues, these regulations are trying to fix the energy sector as well. Guided by the Energy Community Treaty, WB countries are on the road to rebuild their energy systems by applying the Energy Efficiency Directives (2012/27/EU, 2010/30/EU, 2013/31/EU) as well as the Renewable Energy Directive (2009/28/EU). The Energy Community Treaty expresses a shared commitment to energy market reform and the operation and vitalization of an integrated regional market.

The development of legislation and policies in the Western Balkan countries, in line with the EU requirements, is still progressing slowly or moderately. Many pieces of legislation and policies, in all WB6 countries, have failed or are risking failure in meeting certain criteria set by the Community, which requires a better harmonization of their endeavors towards responding positively to the set of requirements.

In addition to legislative and policy problems, huge issues remain from past conflicts over the break-up of the former Yugoslavia that damaged much of the energy infrastructure and compounded the challenge of providing reliable energy supply. To date, electricity systems in many parts of the region remain fragile and in need of investment.

Electricity demand is distinct for its seasonal and weather-related peaks, which are mainly a direct consequence of electricity usage for space heating, poor insulation and lack of the implementation of Energy Efficiency (EE) measures throughout the region. These uncontrolled demand variations often lead to electricity black-outs and rationing. These circumstances have a direct impact on the economic development of the WB countries as well as the wellbeing of their citizens.

It has been assessed by different independent institutions, lastly by the International Renewable Energy Agency (IRENA), that WB6 countries have significant renewable energy potential.¹ Nevertheless, reports of the Energy Community Secretariat indicate that they are being very slow and hesitant in removing non-cost barriers to attract investments in renewable energy projects², and that they are remaining dependent on the conventional way of energy generation which caused compliance gaps in all three energy sectors: electricity, heating and cooling and transport.³

In undergoing a highly dynamic integration process, reflecting on the current strengths, weaknesses, opportunities and challenges is imperative to ensuring proper coordination at both the national and regional level for long term sustainable development of the energy sector.

This short report is drafted with the idea of offering a brief yet comprehensive picture of current facts and figures, active electricity generation capacities, electricity losses as well as potential for development in the energy sector in each of the 6 countries of the Western Balkans. These data are visually portrayed at the Balkan Energy Prospect⁴ platform.

¹ International Renewable Energy Agency, Cost-competitive renewable power generation: Potential across South East Europe, January 2017

² Energy Community, Report of the Secretariat to the Ministerial Council on the Progress in the Promotion of Renewable Energy in the Energy Community.

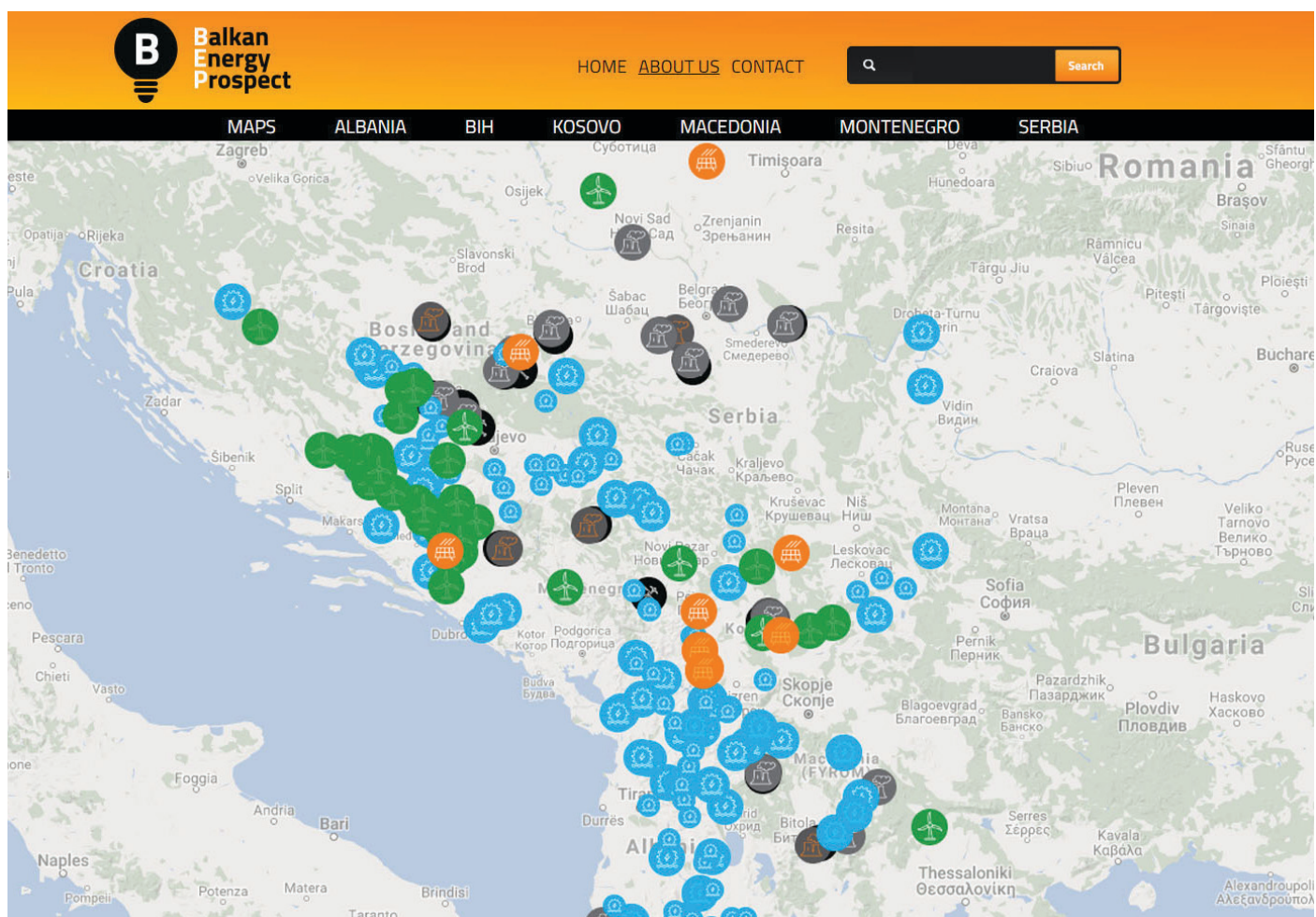
³ Ibid

⁴ Balkan Energy Prospect, www.wb6energyprospect.com

Balkan Energy Prospect platform

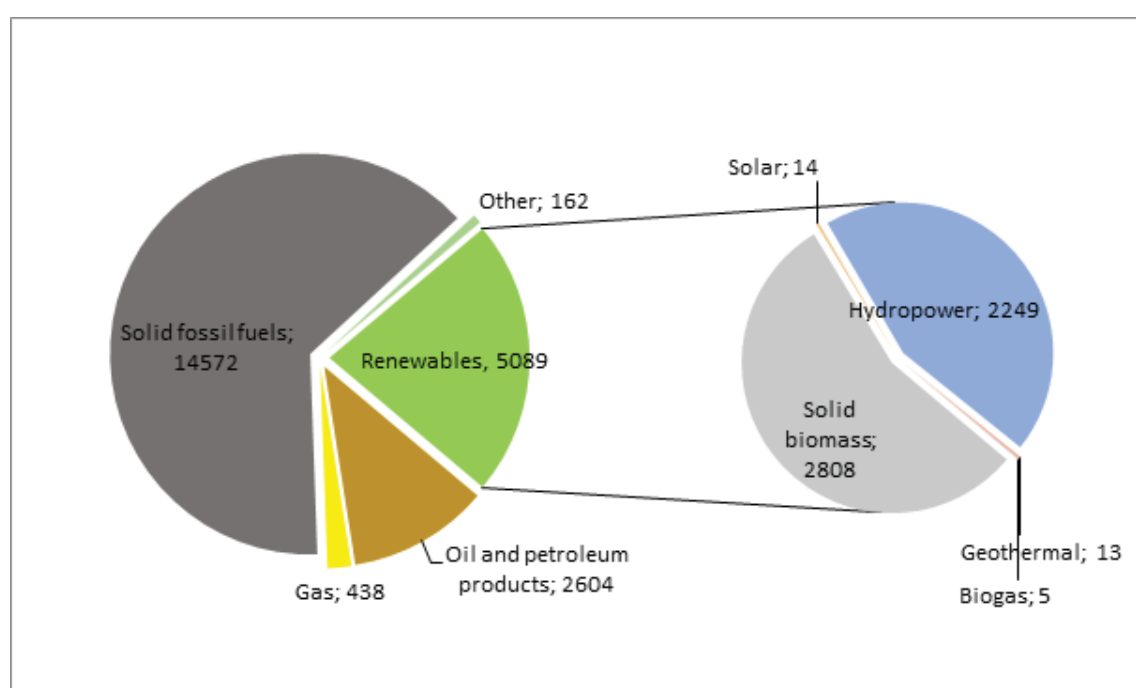
Balkan Green Foundation has created the Balkan Energy Prospect (www.wb6energyprospect.com) to represent an open, resourceful, and informative platform for discovering and analyzing the key insights into each Western Balkan country in terms of their respective energy sectors. This platform is drafted with the idea of offering a reflection of the developments in the energy sector in each of the 6 countries of the WB: Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro, and Serbia.

The platform provides a visual representation of data indicating that efficient electricity access and connection of strategies within the WB region will drive the cooperation process and contribute regionally towards the advancement of their energy systems, guided by the shared commitments, obligations, and targets that derive from the Energy Community Treaty. With an established cooperation and an integrated energy infrastructure amongst each other, countries will increase cross-border cooperation and develop regional projects and lower their carbon economy. As such, the platform provides valuable information about six WB countries in terms of their energy technologies, potential synergies for a future integrated energy market, and capacities for energy diversification within the WB region.



Energy structure

The structure of the energy mix of the countries of this region is completely diverse with some countries having a balanced portfolio of energy sources and others being dependent only on a few types of energy. As far as fossil fuels are concerned, the prevalence of coal/lignite generation in the fuel mix is dominant. In terms of Renewable Energy Sources (RES), currently, hydropower sources are the most commonly used type of renewable energy and has further growth potential across the entire region.



Graph 1. Fuel mix in primary production in the WB6 in ktoe (2013)⁵

Hydropower represents the backbone of some of the electricity systems in the region. In Albania, the power system runs almost exclusively on hydropower whereas in Montenegro hydro represents more than half of electricity produced in the country. Serbia is the third amongst the countries of the Western Balkans with hydropower electricity production.

Besides hydropower sources, RES in general are not utilized and the incentives and regulations for their full exploitation are still lagging behind significantly. Countries of the region are expected to diversify their energy supplies and technologies towards deploying more renewables.

⁵ Energy Community Secretariat, Energy Sector Overview.

According to the latest report conducted by IRENA, since 2011, in the global power sector alone, renewables have accounted for more than half of all capacity additions. Increasing deployment and technological innovation have led to sharp cost reductions and improved cost-competitiveness for solar photovoltaic (PV) and wind, in particular. Nevertheless, WB6 countries, despite their identified potential⁶, and the improved cost-competitiveness of solar PV and wind, the region has utilized the renewables only to a limited extent.





Country	Albania	BiH	Kosovo	Macedonia	Montenegro	Serbia	Total (MW)
Thermal power plants 	0	1,856	1,171	800	218.5	3,905	7,950.5
Hydro 	1,797	2,150.44	49.42	699	667.7	2,898	8,261.56
Wind 	0	0.30	1.35	36.8	0	0.5	38.95
Solar 	0	8.71	0.1	16.7	0	10.8	36.31
Total in WB	1,797	4,026.45	1,221.87	1,552.5	886.2	6,814.3	16,287.32

Table 1. Active Electricity Generation capacities (MW)⁷

The highest utilised wind capacity is in Macedonia with 36.8 MW, followed by Serbia with 10.4 MW. Kosovo and Bosnia and Herzegovina have a small capacity put into operation, whereas Albania and Montenegro are countries that have no active wind generation capacity yet. The IRENA study identifies 153 MW energy potential from wind in Albania; 2.5-5.9 GW in BiH; 1.7 GW in Montenegro, 5.6 GW in Serbia.⁸

With regard to solar generating capacity, Albania and Montenegro have no active generation capacity and Kosovo is shown to have a very small capacity put into operation of 0.1 MW. Bosnia and Herzegovina has 8.71 MW and Serbia 10.8 MW. From the collated data, Macedonia currently generates the highest capacity of electricity from solar PV: 16.7 MW. The IRENA study projects Albania to have up to 1.9 GW potential from solar PV; BiH up to 1 GW; Kosovo with 436 MW; Macedonia with 1.2 GW; Montenegro with 300 MW; and Serbia with 6.9 GW.⁹

It is worth pointing out that all countries in the region are largely endowed with biomass resources, mostly used in the form of fuelwood in the heating and cooking sectors. However, this persistent use of traditional biomass has harmful and damaging environmental and health effects and calls for a replacement by modern biomass and renewable energy solutions for both district and local heating purposes.

⁶ International Renewable Energy Agency, Cost-competitive renewable power generation: Potential across South East Europe, January 2017

⁷ Energy Community Secretariat, Annual Implementation Report, 1 September 2016. Link: https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4332394/3D790302C9FD5024E053C92FA8COD492.pdf

⁸ International Renewable Energy Agency, Cost-competitive renewable power generation: Potential across South East Europe, January 2017

⁹ International Renewable Energy Agency, Cost-competitive renewable power generation: Potential across South East Europe, January 2017

Renewable Energy Sector Overview

Countries of the Western Balkans have made commitments towards 2020 targets of energy from renewable sources in gross final energy consumption. The highest committed percentage comes from BiH with 40%, followed by Albania with 38%, Montenegro 33%, Serbia 27%, Kosovo 25% and the lowest from Macedonia with 21%.

It is crucial to understand that RES exploited most is the hydropower sector; its share in the RES scheme of the WB6 countries is around 95%. The region's average percentage towards reaching these targets is around 70%.





RES 2020 Objective	Albania (38%)		BiH (40%)		Kosovo (25%)	
	Target (MW)	Reached 2015	Target (MW)	Reached 2015	Target (MW)	Reached (2015)
RES						
Hydro 	2,324	1,797	2,700	2,150	240	71.94
Wind 	30	0	33	0.3	150	1.35
Solar 	50	0	16.2	8.2	10	0.15
Biomass 	5	0	35.7	1	14	0
Other						
Total MW	2,409	1,797	2,784.9	2,159.5	414	73.44
Percentage (%) reached	74.60%		77.54%		17.74%	
Sources	IRENA 2017 (Table 4.2);		NREAP, IRENA table 4.4		NREAP	
	State of Energy Sector (ERE) 2015					

Table 2. RES target fulfillments (Albania, BiH, Kosovo)





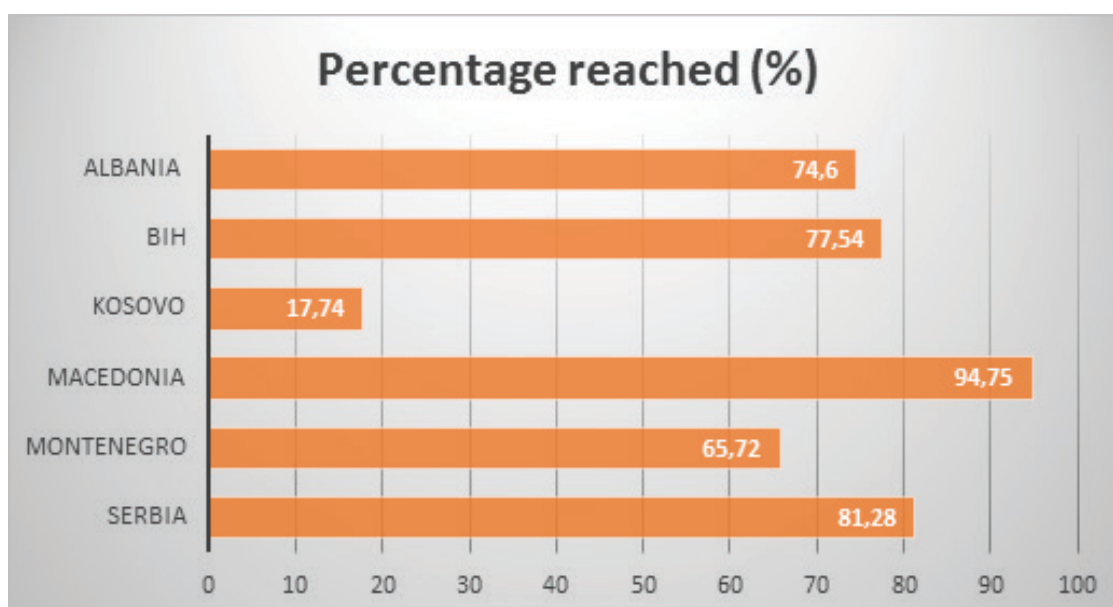
RES 2020 Objective	Macedonia (21%)		Montenegro (33%)		Serbia (27%)	
RES	Target (MW)	Reached 2015	Target (MW)	Reached 2015	Target (MW)	Reached (2017)
Hydro 	709	699	826	668	3,276	2,898
Wind 	50	36.8	151.2	0	500	0.5
Solar 	25.4	16.7	10	0	10	10.8
Biomass 	14	3.99	29.3	0	130	4.9
Other					14	129.9
Total MW	798.4	756.49	1,016.5	668	3,930	3,194.45
Percentage (%) reached	94.75%		65.72%		81.28%	
Sources	NREAP MK; table 10.a				NREAP SR;	
	ERO Annual Report, MK				Energy Balance 2017;	
	IRENA				IRENA	

Table 3. RES target fulfillments (Macedonia, Montenegro, Serbia)

Implementing objectives and reaching the targets remains a challenge. Kosovo has made the lowest progress towards achieving its goals, by reaching only 17.74% of its target, whilst Macedonia reached almost 95% of its 2020 target. Second best in reaching its target is Serbia which has reached 81.28% followed by BiH which has reached 77.54%, Montenegro 65.72% and Albania 74.60%.



Graph 2. Percentage of RES reached

With the exception of Albania, all of the WB6 countries have approved feed-in tariffs for all RES. Albania's supporting policies revolve around the small HPP, more precisely HPPs with capacities up to 15 MW. In the case of Bosnia and Herzegovina, feed-in tariffs are in place for all technologies, but with some limitations with regards to the installed capacity.





Country	Albania	BiH	Kosovo	Macedonia	Montenegro	Serbia
RES	Feed-in EUR/ MWh	Feed-in EUR/ MWh	Feed-in EUR/ MWh	Feed-in EUR/ MWh	Feed-in EUR/ MWh	Feed-in EUR/ MWh
Hydro 	55,3	93,75	67,47	59,16	86,15	86,33
Wind 	/	104,84	85	89	96,1	92
Solar 	/	205,96	136,4	140	120	173,56
Biomass 	/	196,4	71,3	160,5	122,55	113,24
Sources	www.res-legal. eu	www.res-legal. eu	ERO Supporting Scheme			NREAP
Notes	Old and new HPP			median estimation		median estimation
	up to 15MW (2016)					

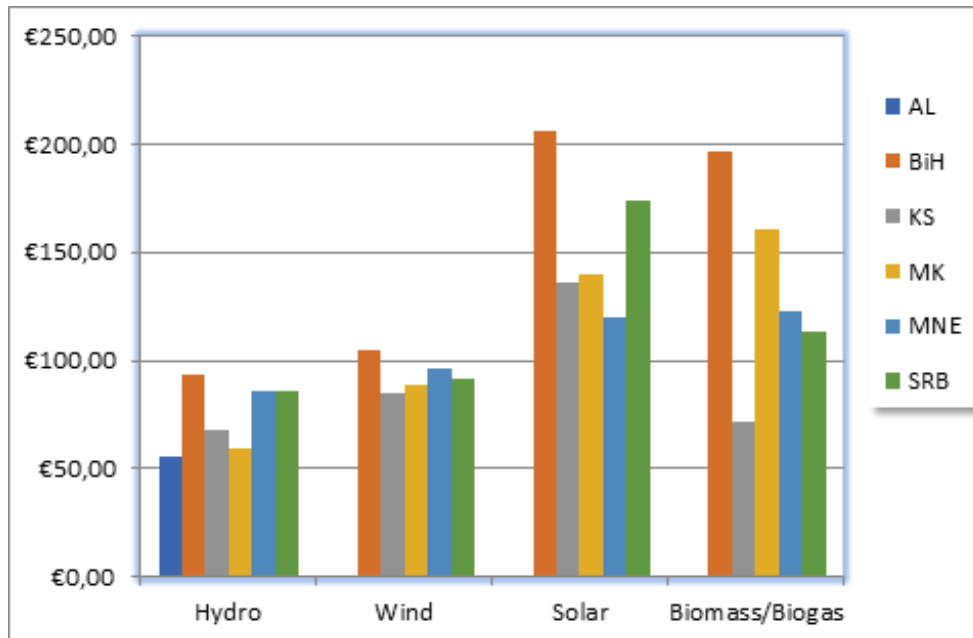
Table 4. Feed-in tariffs

A successful trend of generating capacities from small HPPs has been realized in Bosnia and Herzegovina, Montenegro, and Macedonia. The average Feed-in tariff from the respective supporting schemes in the WB6 stands around 75 EUR/MWh.

Within their commitments towards the Energy Community, the region has set an objective of overall wind generating capacity of 914.2 MW, but only 38.95 MW capacities have been installed up to 2015. Concrete steps should be made in exploitation of this source, since wind is an abundant resource in the region. The Feed-in tariff average for the WB6 countries stands just below 80 EUR/MWh.

Although at a small scale, the interest in generating power from solar PV is increasing, following the decline of the cost for installing new generating PV capacities. In most cases the quotas for solar PV plants for 2020 are relatively small, for example the target capacity in Kosovo, Montenegro and Serbia is 10 MW each. The most ambitious target has been set by Albania, at 50 MW. A set target for the region is just above 120 MW, while the reached capacity is still below 30%. From the supporting schemes, the average feed-in tariff stands around 130 EUR/MWh.

The Biomass and Biogas usage for generation of energy is relatively low. Serbia is the leading party in exploiting this resource, with the set target of 130 MW (which accounts for 59% of the region's total), with current capacities of 21 MW. The supporting scheme feed-in tariff average for these RES is 110.67 EUR/MWh.



Graph 3. Feed-in tariff EUR/MWh per RES

From the above graph, it is noticed that with the exception of wind feed-in tariffs, the support scheme for other sources varies across the region. Still some countries have more harmonized feed-in tariffs, as is the case of Kosovo and Macedonia, where the main difference can be seen with Biomass and Biogas.

Having a commitment on the connectivity agenda, WB6 countries should move towards a more synchronized support scheme. The current schemes create the climate for a fragmented market. In order, not to distort the current market, and have a steady path of transition, the region should move towards legislative stability and the reduction of risk investment, improve the transmission grid and support technology innovation.

Electricity Losses

Most of the countries of the Western Balkans are positioned as net importers of electricity as the demand surpasses generation capacities.¹⁰ Higher demand comes as a result of high percentage of losses in the distribution system. Kosovo, followed by Albania, record the highest electricity losses of total distribution demand with about 32% each. Montenegro loses about 18%, Macedonia about 15% of their demand, Serbia 14.1% and Bosnia and Herzegovina 10.45%. The total electricity losses of all WB6 account 10,120 GWh. This amount of lost electricity constitutes twice the amount of Kosovo's electricity consumption.¹¹



Country	Albania	BiH	Kosovo	Macedonia	Montenegro	Serbia	Total (GWh)
Electricity Losses (GWh) of total distribution demand 	1,795	1,035.1	1,488	914	454	4,434	10,120.1
Losses in percentage % 	31.34%	10.45%	31.8%	14.8%	17.6%	14.1%	

Table 5. Electricity Losses (GWh) of total distribution demand

¹⁰ Annex 1, Electricity facts and figures, Description data (2015)

¹¹ Annex 1, Electricity facts and figures, Description data (2015)

Energy Efficiency

Energy is used inefficiently in the Western Balkans compared to many other countries. The energy intensity of the six Western Balkans countries is around three times higher than the average for the European Union.¹² This high energy intensity is a result of aged and often obsolete energy infrastructure and poorly maintained and outdated energy-using capital stock – especially in industry and buildings.¹³

The residential and transport sectors represent the largest components of Total Final Energy Consumption, accounting for 50 to 70% of the total.¹⁴ Industry is also a significant consumer in Serbia, Montenegro and Macedonia.¹⁵ As a result, there is significant untapped energy efficiency potential in the Western Balkans. International Energy Agency and the World Bank estimates point to potential energy savings in the WB6 of up to 10% in the transport sector, 10-35% for households, 35-40% in the public sector, 10-30% in services and 5-25% in industry and commerce.¹⁶

As signatories of the Energy Community Treaty, Western Balkan countries have committed to reach set targets and implement three Directives: Energy Efficiency (EED-2012/27/EU, superseding the Energy Services Directive, ESD-2006/32/EC from 2017), Energy Performance of Buildings (EPBD-2010/31/EU), and Energy Labeling of Products (ELD-2010/30/EU) in order to improve their energy efficiency situation. The adoption and transposition of these directives is still a work in progress in the WB6.¹⁷ The WB6 countries are also working to improve their systems for monitoring, reporting and planning their energy and climate policies and aligning them with the Emission Monitoring Regulation.

All the countries of the Western Balkans have committed to reach a target of 9% each, by 2018. So far, the highest progress in reaching the target is marked from Macedonia which has reached 4.8% out of 9%, followed by Serbia with 4.4%, Kosovo 4% and BiH with 3.8%. Albania's data are missing since they have not submitted the latest report yet to the Energy Community Secretariat, whereas Montenegro has only submitted a partial reporting, thus their official data account only 2.3% out of 9% due to their pending report.

	Albania		BiH		Kosovo		Macedonia		Montenegro		Serbia	
	%	ktoe	%	ktoe	%	ktoe	%	ktoe	%	ktoe	%	ktoe
EE Target by 2018	9	168	9	298	9	92	9	147.2	9	58.9	9	752
Reported energy savings by 2015	NA	NA	3.8%	127	4%	41	4.8%	79.4	2.3% (partial reporting, full report pending)	14.8	4.4	370

Table 6. WB6 reported energy savings by 2015

¹² European Commission, Connectivity Agenda, Co-financing of Investment Projects in the Western Balkans, 2016.

¹³ European Commission, Instrument for Pre-Accession Assistance (IPA II) 2014-2020, Regional Energy Efficiency Programme for the Western Balkans ("REEP Plus")

¹⁴ WBIF, Financing Energy Efficiency Investments in the Balkans, https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4508400/46ECF-CF6F44D6F26E053C92FA8C0EF67.pdf Annex 1, Electricity facts and figures, Description data (2015)

¹⁵ Annex facts and figures

¹⁶ WBIF, Financing Energy Efficiency Investments in the Balkans, https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/4508400/46ECF-CF6F44D6F26E053C92FA8C0EF67.pdf.

¹⁷ The Energy Community analyses each country's compliance with its Community commitments in its Annual Implementation Report, which is available at www.energy-community.org

It is crucial that the WB6 capture their energy efficiency potentials and increase their political support to develop national instruments for market segments like public sector, residential buildings, transport, etc. Given that, when properly supported by a solid legal and institutional framework and backed up by well-designed and implemented investment programs, energy efficiency delivers many cost-effective benefits for competitiveness, the environment, security of energy supply and economic development in general.

Interconnection

Since 2014, WB6 countries with the support of the EU have started a closer regional cooperation under the so-called Berlin Process/Connectivity Agenda. One of the main aims under this process is building and connecting transport and energy infrastructure as a driver for growth and jobs. Thus, WB6 has made the Connectivity Agenda one of its highest priorities, with a special emphasis on the preparation and financing of concrete regional infrastructure investment projects among which transmission and interconnection lines are also included.

Currently, the number of interconnectors are as the following: BiH (37), Serbia (22), Montenegro (11), Kosovo (7), Albania (5), whereas Macedonia (4).

Country		Albania	BiH	Kosovo	Macedonia	Montenegro	Serbia
Horizontal Transmission Network (km)	Substation capacity (MVA)	4,026	12,857	5,782	2,700	3,359	30,498
	Number of interconnectors	5	37	7	4	11	22

Table 7. Transmission Networks

Energy infrastructure investments within the connectivity agenda are foreseen to be built through European Commission's Western Balkans Investment Framework (WBIF), which intends to co-finance mature energy and transport infrastructure projects together with loans from the International Financial Institutions.

These lines will improve the security of supply and the stability of the WB6 countries power systems. They will also help to develop a regional electricity market in which production and transmission capacity can be managed throughout the Western Balkans, rather than on a national basis. This will reduce waste, excess capacity and ensure better regional integration.



WB6 Transmission and Interconnection Lines

It is important for the WB6 countries to take concrete legal steps towards achieving their goals. The crucial component is how the WB6 should continue national reforms and regional market integration, and pave the way of integration of SEE markets into the pan-European electricity market.

The countries must push forward towards establishing organized marketplaces as the elementary need for the efficient electricity trading especially now since the cross-border electricity trading is well below the region's potential, enhancing the visibility of market fragmentation.

Annex 1. Electricity facts and figures – Description data (2015) ¹⁸

Country		Albania	BiH	Kosovo	Macedonia	Montenegro	Serbia
Description of data (2015)							
Electricity production (GWh)		5,865	14,408	5,503	5,251	2,872	35,912
Net imports (GWh)		2,355	3,747	715	2,656	865	1,050
Net exports (GWh)		956	5,884	628	143	273	2,048
Gross electricity consumption (GWh)		7,265	12,606	5,570	7,795	3,464	35,217
Losses in transmission (%)		2%	2%	1.29%	1.7%	3.8%	2.22%
Losses in distribution (%)		31.3%	10.45%	31.8%	14.8%	17.6%	14.1%
Consumption of electricity (GWh)		24	27.86	112	208	9	1,518
Final consumption of electricity (GWh)		5,069	11,183	3,860	6,600	2,879	28,551
Consumption structure (GWh)	Industrial, transport, services and agriculture sectors	2,547	6,460	1,746	3,484	1,625	14,469
	Households (residential customers)	2,522	4,723	2,114	3,140	1,251	14,062
Net max electrical capacity of power plants (MW) of which:		1,895	4,009	1,222	2,053	886	7,172
	Coal-fired	/	1,856	1,171	800	218.5	3,905
	Gas-fired	/	/	/	287	/	353
	Oil-fired	98	/	/	210	/	/
	Hydro, total	1,797	2,150.44	49.42	699	667.7	2,898
Horizontal Transmission Network (km)	Substation capacity (MVA)	4,026	12,857	5,782	2,700	3,359	30,498
	Number of interconnectors	5	37	7	4	11	22

¹⁸ Energy Community Secretariat

