

REPORT
ON ANCILLARY SERVICES AND BALANCING MARKET OPERATIONS
IN BOSNIA AND HERZEGOVINA FOR 2025

Abbreviations

SERC – State Electricity Regulatory Commission

NOSBiH – Independent System Operator in Bosnia and Herzegovina

BSP – Balancing Service Provider

ASP – Ancillary Service Provider

BRP – Balance Responsible Party

ENTSO-E – European network of transmission system operators for electricity

EPBiH – The utility JP Elektroprivreda Bosne i Hercegovine d.d. Sarajevo

EPHZHB – The utility JP Elektroprivreda Hrvatske zajednice Herceg Bosne d.d. Mostar

ERS – Mixed Holding Elektroprivreda of Republika Srpska, parent company, stk. company Trebinje

EMS – Elektromreža Srbije

CGES - Electricity Transmission System of Montenegro

HOPS – Croatian Transmission System Operator

ELES – Elektro - Slovenija d.o.o. - Electricity Transmission System Operator in Slovenia

FSkar – Financial Settlement of KΔf, ACE and ramping period

FCP – frequency containment process

FCR – frequency restoration reserve

aFRR – frequency restoration reserve with automatic activation

mFRR – frequency restoration reserve with manual activation

Introduction

Balancing energy market is a part of the wholesale energy market and it comes after the bilateral energy market. Unlike the bilateral energy market whose participants in purchase or sale transactions may be any licenced market participant, in the balancing energy market it is obligatory to have independent system operator as one of the participants in the purchase/sale transaction.

Pursuant to the Law on Establishing Independent System Operator in BiH, NOSBiH is responsible for managing the balancing market in BiH which is defined as ‘the central market for electricity purchase and sale managed by NOSBiH with the purpose to maintain continuous balance of demand and supply in real time, as well as additional mechanisms conducted by NOSBiH in order to ensure system services’. In addition, one of NOSBiH’s operations is to provide ancillary services which are defined by the Law on Establishing Independent System Operator in BiH as ‘all services, with the exception of electricity generation and transmission, which are delivered to NOSBiH with the purpose of providing the system services including, among others, regulation of frequency and reserve, reactive power, voltage regulation and a power plant capability to start up without an external electricity supply’. Therefore, the balancing market and the mechanism of providing ancillary services are the ‘tools’ by which NOSBiH maintains the balance between generation, exchange and consumption of electricity in real time, maintains required level of reserve for ancillary services of secondary and tertiary regulation and enables safe operations of the electric power system. Participation in the balancing market is regulated by an agreement which NOSBiH concludes with a power market participant in line with the Market rules.

The main principles of the balancing in 2025

In Bosnia and Herzegovina, the Market rules entered into force on 1st January 2016 thus establishing the market principles in the balancing processes and in allocation of the balancing costs of the power system in BiH. With the purpose of improving processes in the balancing energy market the Market rules¹ were amended at the end of 2021 and the changed Market rules have started to apply as of 1st January 2022.

SERC Decision No. 04-28-9-361-7/24 of 11.06.2025 approved the Market Rules enabling the participation of energy storage systems (ESS) in the electricity market in BiH. The aforementioned amendments also introduced a new ancillary/balancing service – automatic frequency restoration with fast response (aFRR-s), as a special product intended for resources that can provide a response speed of at least 10 MW/s.

An organized market of capacity reserve and balance energy was established for frequency containment process (FCP), and for automatic and manual activation of frequency – aFRR and mFRR.

The reserve capacity market was established for aFRR and mFRR processes and the right to participate belong to those balancing service providers (BSPs) whose capacities satisfy the technical preconditions for providing the balancing services. The reserve capacity prices in 2025 were limited by relevant decisions made by the State Regulatory Electricity Commission (SERC). In case that the required scope of capacity were not provided in the market, there was a possibility to procure the missing quantities. If providers had failed to deliver certain amount of aFRR and mFRR capacity, they would incur penalty in amount which was equal to 10% of the price cap for aFRR i.e. mFRR. aFRR and mFRR reserve capacities were contracted on a monthly basis.

¹ Market rules were issued by NOSBiH, adopted by SERC by its Decision no 04-28-9-202-2/21 as of 13 October 2021

The reserved (contracted) capacity had to be offered at the balancing electricity market where power and electricity price were also offered in case of activation. At the daily balancing energy market mFRR, the right to participate also belonged to the bids without reserved capacity i.e. voluntary bids.

The procurement of aFRR was done symmetrically for positive and negative range of control, and the procurement of mFRR was done separately for upward and downward regulation.

Through the market procedure, 100% of FCR capacity was secured for 2025. The procurement and service provision process is organized at the level of the calendar month. BSPs were obliged to provide the contracted FCR capacity, while the FCR energy is settled according to energy prices set by the FSkar process.

SERC's Decision on Determination of Coefficients and Price Caps for Ancillary Services as of 17 December 2021 and Decision on Amendments to the Decision as of 13 December 2022 determined hourly price caps² for control capacity and delivered balance energy:

- The price for the balancing energy for upward mFRR is limited to 989.46 KM/MWh.
- The price for the balancing energy for downward mFRR is limited to -401.28 KM/MWh.
- Difference in prices of energy for upward and downward aFRR bids is limited to 40.00 KM/MWh.
- The price cap for aFRR amounts to 43.00 KM/MW/h.
- The price cap for mFRR upward capacity amounts to 9.00 KM/MW/h.
- The price cap for mFRR downward capacity amounts to 2.10 KM/MW/h.

Based on the balancing energy prices of activated aFRR and mFRR bids imbalance prices were determined, which were used for the calculation of imbalance costs of balance responsible parties (BRPs) in BiH. Imbalance prices were determined for each 15-minute imbalance settlement period according to the most expensive bid activated, for realized electricity deficit and surplus respectively

Balancing services in 2025

Table 1 presents specific values related to balancing services capacity in 2025. Image 1 graphically presents the share that the BSP had in providing specific balancing services and the share of undelivered capacity on an annual basis. Detailed monthly realization of capacity for some balancing services is shown in tables 2 - 6.

² Price cap is determined by SERC – Decision on determination of coefficients and price caps for ancillary services

Table 1: Report on balancing capacities in BiH for the year 2025

Reserve capacity and capacity cost		FCR	aFRR Off-peak load (00.00 - 06.00)	aFRR Peak load (06.00 - 24.00)	mFRR Upward	mFRR Downward
Required capacity	MW	14,00	27,57	46,42	196,00	68,00
Contracted capacity	MW	14,00	27,57	46,42	196,00	66,19
Capacity contracted at the market	MW	14,00	23,12	46,09	196,00	64,32
Price of contracted capacity	KM/MW/h	7,57	42,97	41,14	5,46	1,01
Contracted cost	KM	927.772	2.594.335	12.545.315	9.371.550	587.375
Delivered capacity	MW	14	9	19	138	52
Delivered capacity	%	100%	34%	41%	71%	78%
Capacity cost	KM	927.772	887.385	5.040.816	6.630.672	453.051
Unprovided capacity	MW	0	18	28	58	15
Penalty for unprovided capacity	KM	0	170.771	778.109	453.540	26.297

The table shows average capacity values presented in 1 hour.

BSP's share in delivered capacity						
EP BiH	MW	10	4	8	47	1
EP BiH	%	71%	45%	42%	34%	2%
ERS	MW	4	5	11	17	30
ERS	%	29%	55%	58%	12%	57%
EP HZHB	MW	0	0	0	75	2
EP HZHB	%	0%	0%	0%	54%	3%
Elektrane Stanari	MW	0			0	20
Elektrane Stanari	%	0%			0%	38%

The table shows average capacity values presented in 1 hour.

The balancing market in BiH in 2025 can be characterized as stable. Capacity prices are close to last year's prices. The price for upward balancing energy was higher, and the price for downward balancing energy was lower in comparison to last year. Insufficient availability of balancing capacities at night, especially for downward regulation, is also present in 2025.

Frequency Containment Process (FCP)

A market-based procedure of procurement capacity for frequency containment reserve (FCP) was introduced from 2023. BiH's obligations for this reserve in 2025 amounted to 14 MW and the entire capacity was provided through a market-based procurement procedure.

Automatic frequency restoration – aFRR

In 2025 NOSBiH had an average of 9 MW of aFRR capacity in off peak load hours (from midnight until 6:00 am) which makes only 34% of required capacity which is less than in last year. In peak load periods (from 6:00 am until midnight) there was an average amount of 19 MW of aFRR capacity which makes 41% of the capacity required. The cost of aFRR capacity in 2025 amounted to approximately 6 million KM. During the year three public power utilities with their balancing resources were registered as aFRR providers, two of them delivered contracted capacity.

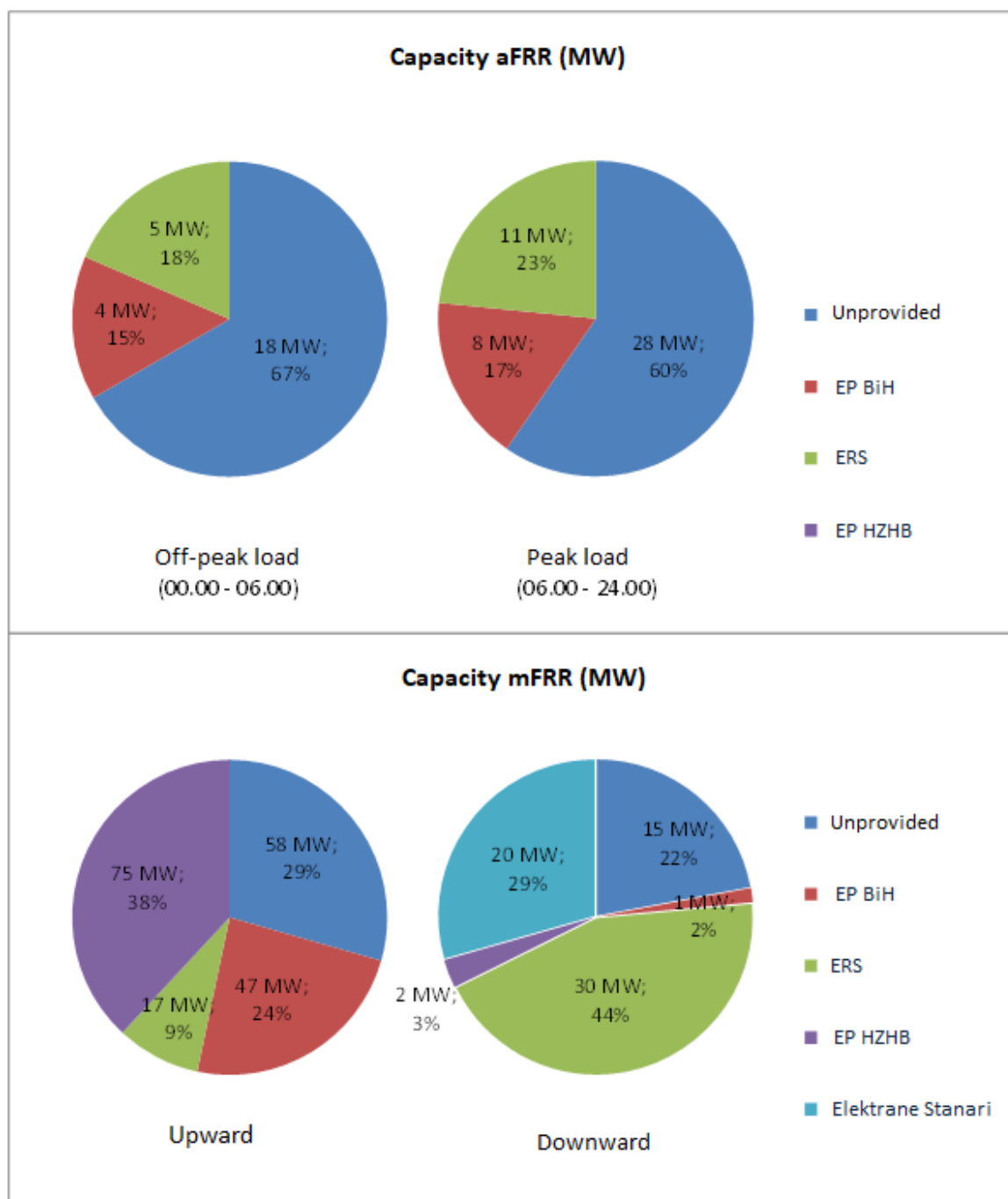


Image 1: Share of BSPs in delivered balancing capacity in BiH in 2025

Manual frequency restoration – mFRR

In 2025 NOSBiH had an average of 138 MW of upward mFRR capacity, which makes 71% of required capacity. Average available capacity of downward mFRR amounted to 52 MW, which makes around 78% of the required capacity. The cost of delivered capacity amounted to 6,6 million KM for upward mFRR and 0.45 million KM for downward mFRR. The availability of balancing capacities is worse compared to the previous year.

During the year 2025 four companies had their prequalified resources for providing mFRR balancing service.

Table 2: Report on balance services in BiH for the year 2025
Frequency Containment Reserve - FCR

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
Required capacity	MW	14	14	14	14	14	14	14	14	14	14	14	14,00	108%
Contracted capacity	MW	14	14	14	14	14	14	14	14	14	14	14	14,00	108%
Capacity contracted at the market	MW	14	14	14	14	14	14	14	14	14	14	14	14,00	133%
Price of contracted capacity	KW/MW	7,57	7,57	7,57	7,57	7,57	7,57	7,57	7,57	7,57	7,57	7,57	7,57	102%
Contracted cost	KM	78.797	71.172	78.691	76.255	78.797	76.255	78.797	78.797	76.255	78.903	76.255	78.797	110%
Delivered capacity	MW	14	14	14	14	14	14	14	14	14	14	14	14,00	108%
Delivered capacity	%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100,00%	100%
Capacity cost	KM	78.797	71.172	78.691	76.255	78.797	76.255	78.797	78.797	76.255	78.903	76.255	78.797	110%
Undelivered capacity	MW	0	0	0	0	0	0	0	0	0	0	0	0,00	
Penalty for undelivered capacity	KM	0	0	0	0	0	0	0	0	0	0	0	0	
The table shows average capacity values presented in 1 hour.														
BSP's share in delivered capacity														
EP BiH	MW	10	10	10	10	10	10	10	10	10	10	10	10,00	152%
EP BiH	%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	71%	
ERS	MW	4	4	4	4	4	4	4	4	4	4	4	4,00	80%
ERS	%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	29%	
EP HZHB	MW	0	0	0	0	0	0	0	0	0	0	0	0,00	
EP HZHB	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Elektreane Stanari	MW	0	0	0	0	0	0	0	0	0	0	0	0,00	
Elektreane Stanari	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

The table shows average capacity values presented in 1 hour.

Table 3: Report on balance services in BiH for the year 2025
aFRR - off-peak load (00.00 - 06.00 hrs)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Required capacity	MW	33	31	29	27	24	25	28	27	25	25	27	30	27,57	100%
Contracted capacity	MW	33	31	29	27	24	25	28	27	25	25	27	30	27,57	100%
Capacity contracted at the market	MW	31	31	29	27	24	24	17	17	7	14	27	30	23,12	108%
Price of contracted capacity	KM/MW	42,97	42,96	42,96	42,96	42,95	42,96	42,96	42,96	43,00	43,00	42,96	42,96	42,97	100%
Contracted cost	KM	263,729	223,759	230,492	208,782	191,747	193,302	223,739	215,741	193,500	201,025	208,782	239,735	2,594,335	100%
Delivered capacity	MW	11	8	13	14	11	10	12	6	3	5	8	12	9,44	97%
Delivered capacity	%	33%	26%	43%	52%	45%	41%	41%	22%	12%	21%	31%	41%	34,23%	
Capacity cost	KM	86,409	58,102	100,047	108,399	85,265	78,805	92,444	48,509	23,202	41,550	65,351	99,303	887,385	97%
Undelivered capacity	MW	22	23	16	13	13	15	16	21	22	20	19	18	18,13	102%
Penalty for undelivered capacity	KM	17,741	16,575	13,052	10,041	10,652	11,454	13,135	16,736	17,030	15,948	14,354	14,054	170,771	101%
The table shows average capacity values and prices presented in 1 hour.															
BSP's share in delivered capacity															
EP BiH	MW	5	3	6	5	3	2	4	2	3	5	4	8	4,25	88%
EP BiH	%	50%	36%	49%	39%	24%	21%	36%	37%	100%	99%	45%	61%	45%	
ERS	MW	5	5	6	9	8	8	7	4	0	0	5	5	5,18	108%
ERS	%	50%	64%	51%	61%	76%	79%	64%	63%	0%	1%	55%	39%	55%	
EP HZHB	MW	0	0	0	0	0	0	0	0	0	0	0	0	0,00	
EP HZHB	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
The table shows average capacity values presented in 1 hour															

Table 4: Report on balance services in BiH for the year 2025
aFRR - peak load (06:00 - 24.00 hrs)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Required capacity	MW	54	49	47	45	40	41	47	46	42	45	50	51	46,42	101%
Contracted capacity	MW	54	49	47	45	40	41	47	46	42	45	50	51	46,42	101%
Capacity contracted at the market	MW	54	49	47	45	40	41	47	46	38	45	50	51	46,09	101%
Price of contracted capacity	KM/MW	41,16	40,98	40,59	40,51	40,36	41,21	41,65	41,62	41,92	41,56	41,02	41,06	41,14	105%
Contracted cost	KM	1.240.155	1.012.103	1.064.608	984.366	900.835	912.330	1.092.341	1.068.347	950.778	1.043.572	1.107.529	1.168.352	12.545.315	106%
Delivered capacity	MW	31	24	23	20	17	16	18	15	10	12	16	24	18,87	80%
Delivered capacity	%	58%	49%	50%	45%	43%	40%	38%	33%	23%	26%	32%	46%	40,66%	
Capacity cost	KM	717.825	491.802	521.925	442.490	383.374	362.783	407.591	344.389	213.512	267.178	352.127	535.820	5.040.816	85%
Undelivered capacity	MW	23	25	24	25	23	25	29	31	32	33	34	27	27,54	124%
Penalty for undelivered capacity	KM	54.094	54.187	56.869	57.014	54.863	57.113	70.083	74.330	75.144	79.784	78.847	65.781	778.109	123%
The table shows average capacity values and prices presented in 1 hour.															
BSP's share in delivered capacity															
EP BiH	MW	12	10	9	7	5	4	7	5	7	9	8	12	7,90	81%
EP BiH	%	38%	40%	39%	33%	32%	22%	40%	34%	74%	76%	49%	52%	41,84%	
ERS	MW	20	14	14	14	12	13	11	10	2	3	8	11	10,98	79%
ERS	%	62%	60%	61%	67%	68%	78%	60%	66%	26%	24%	51%	48%	58,16%	
EP HZHB	MW	0	0	0	0	0	0	0	0	0	0	0	0	0,00	
EP HZHB	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0,00%	
The table shows average capacity values presented in 1 hour															

Table 5: Report on balance services in BiH for the year 2025
mFRR upward

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
Required capacity	MW	196	196	196	196	196	196	196	196	196	196	196	196,00	100%
Contracted capacity	MW	196	196	196	196	196	196	196	196	196	196	196	196,00	100%
Capacity contracted at the market	MW	196	196	196	196	196	196	196	196	196	196	196	196,00	100%
Price of contracted capacity	KW/MW	4,58	4,58	4,58	4,58	4,62	6,84	7,03	7,03	7,31	5,19	4,58	4,58	105%
Contracted cost	KW	667.145	602.582	666.248	645.624	673.469	965.290	1.024.607	1.024.607	1.031.544	757.665	645.624	667.145	105%
Delivered capacity	MW	139	152	159	107	174	159	153	135	121	137	114	112	93%
Delivered capacity	%	71%	77%	81%	55%	89%	81%	78%	69%	62%	70%	58%	57%	
Capacity cost	KW	470.073	465.032	539.501	349.842	594.457	787.986	805.472	699.063	641.973	525.935	373.553	377.785	98%
Undelivered capacity	MW	57	44	37	89	22	37	43	61	75	59	82	84	123%
Penalty for undelivered capacity	KW	38.343	26.799	24.799	57.406	15.040	23.704	28.802	40.908	48.698	39.707	52.967	56.367	123%
The table shows average capacity values and prices presented in 1 hour.														
BSPs share in delivered capacity														
EP BiH	MW	54	66	62	60	62	39	24	26	39	40	46	46	79%
EP BiH	%	39%	43%	39%	56%	36%	25%	16%	19%	32%	29%	40%	41%	
ERS	MW	0	0	0	0	22	51	41	38	31	19	0	0	52%
ERS	%	0%	0%	0%	0%	13%	32%	27%	28%	25%	14%	0%	0%	
EP HZHB	MW	85	86	96	47	89	69	87	71	51	78	68	66	131%
EP HZHB	%	61%	57%	61%	44%	51%	43%	57%	52%	42%	57%	60%	59%	
Elektreane Stanari	MW	0	0	0	0	0	0	0	0	0	0	0	0	
Elektreane Stanari	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
The table shows average capacity values presented in 1 hour.														

Table 6: Report on balance services in BiH for the year 2025
mFRR downward

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
Required capacity <i>MW</i>	68	68	68	68	68	68	68	68	68	68	68	68	68,00	100%
Contracted capacity <i>MW</i>	68	68	68	68	68	68	68	68	46	68	68	68	66,19	97%
Capacity contracted at the market <i>MW</i>	68	68	68	68	68	68	68	68	46	46	68	68	64,32	95%
Price of contracted capacity <i>KM/MW</i>	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97	1,09	1,42	0,97	0,97	1,01	72%
Contracted cost <i>KM</i>	48.896	44.164	48.830	47.318	48.896	47.318	48.896	48.896	36.137	71.811	47.318	48.896	587.375	70%
Delivered capacity <i>MW</i>	65	63	63	54	31	42	52	54	37	36	58	67	51,90	94%
Delivered capacity %	95%	93%	93%	79%	45%	61%	77%	80%	68%	54%	85%	99%	78,40%	
Capacity cost <i>KM</i>	46.441	40.875	45.094	37.510	23.894	29.084	38.108	38.432	27.137	38.256	39.761	48.457	453.051	67%
Undelivered capacity <i>MW</i>	3	5	5	14	37	26	16	14	22	32	10	1	15,38	121%
Penalty for undelivered capacity <i>KM</i>	496	664	754	2.174	5.800	3.991	2.431	2.113	1.328	4.931	1.526	89	26.297	112%
The table shows average capacity values and prices presented in 1 hour.														
BSP's share in delivered capacity														
EP BiH <i>MW</i>	0	0	0	0	0	0	0	0	4	8	0	0	1,01	18%
EP BiH %	0%	0%	0%	0%	0%	0%	0%	0%	12%	21%	0%	0%	1,94%	
ERS <i>MW</i>	40	38	38	35	31	27	36	29	0	5	33	42	29,60	165%
ERS %	61%	61%	60%	66%	100%	65%	68%	54%	0%	14%	57%	63%	57,04%	
EP HZHB <i>MW</i>	0	0	0	0	0	0	0	0	8	13	0	0	1,73	14%
EP HZHB %	0%	0%	0%	0%	0%	0%	0%	0%	21%	35%	0%	0%	3,33%	
Elektreane Stanari <i>MW</i>	25	25	25	18	0	14	17	25	25	11	25	25	19,56	100%
Elektreane Stanari %	39%	39%	40%	34%		35%	32%	46%	67%	30%	43%	37%	37,69%	

The table shows average capacity values presented in 1 hour.

Balancing market

In 2025, for the purpose of BiH power system balancing 74 259 MWh of upward balancing energy was activated (injected energy) with average price of 349.11 KM/MWh. The total cost of this energy is 17% higher than in 2024 due to the larger quantities and higher average price of balance energy.

In 2025, activated downward balancing energy (energy takeover) amounted to 41 832 MWh. Average price for this energy was 48.64 KM/MWh considering the energy with offered negative price as well. Downward balance energy prices are lower compared to 2024 prices.

Imbalance

There were 11 balance responsible parties (BRPs) active in BiH in 2025, not counting the so called 'trading BRPs', i.e., the BRPs with no imbalance realized within BiH. Average imbalance prices in 2025 were 223.13 KM/MWh for shortage and 76.47 KM/MWh for surplus of energy. These prices are 15% and 4% higher compared to last year's imbalance prices. Imbalance prices ranged from -2 014.50 KM/MWh up to 2 933.75 KM/MWh, considering the activated cross-border balancing energy for the needs of the LFC area of BiH. In 2025 there were negative imbalance prices for the realized surplus in 901 calculation periods (15 min), which makes 2.57% of the time in 2025.

Image 2 and Table 7 show the deviations of the Control Area BiH over the past few years.

Table 7: Indicators of BiH deviations over the past five years

Imbalance BiH		Energy shortage						Energy surplus					
		2020	2021	2022	2023	2024	2025	2020	2021	2022	2023	2024	2025
Total	MWh	-29.318	-80.435	-86.765	-46.142	-88.806	-121.318	52.587	35.417	33.014	45.672	41.387	52.785
Max. hourly	MW	-149	-742	-270	-163	-901	-154	218	118	216	143	193	199

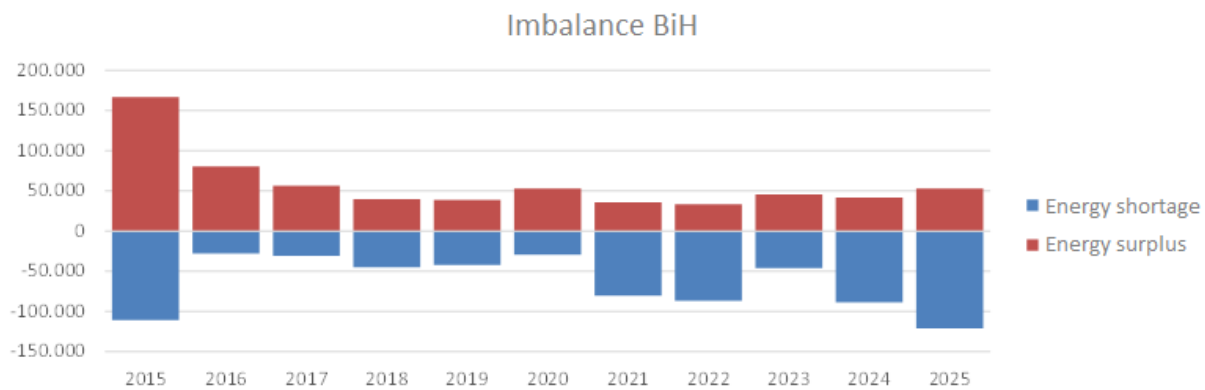


Image 2: Annual deviations of BiH Control Area

Table 8 presents values of activated balancing energy, energy prices and relevant costs by taking into consideration cross-border activations for the needs of BiH Control Area, exempting the energy activated within BiH for the needs of other system operators.

Engaged energy

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
FCR upward	253	223	253	280	274	246	260	222	239	292	301	362	3,207	107%
FCR downward	232	228	354	305	272	272	212	242	226	148	129	104	2,725	84%
aFRR upward	6,371	4,282	5,223	5,727	2,627	2,633	4,259	3,020	1,758	1,942	4,840	8,006	50,688	106%
aFRR downward	3,621	2,590	3,776	2,750	3,955	3,882	1,945	2,368	1,584	1,938	1,721	1,708	31,837	68%
mFRR upward	2,133	2,198	800	2,535	565	283	1,163	956	756	1,829	3,654	3,493	20,365	118%
mFRR downward	1,553	179	436	978	566	842	392	888	856	520	56	6	7,270	349%
Balancing energy upward	8,756	6,703	6,276	8,542	3,466	3,162	5,682	4,199	2,753	4,664	8,794	11,862	74,259	109%
Balancing energy downward	5,405	2,997	4,565	4,033	4,793	4,996	2,549	3,497	2,667	2,606	1,906	1,818	41,832	80%
Balancing cost and realized average prices														
Upward - cost	3,066,494	2,548,574	1,551,499	2,835,380	854,375	612,978	1,604,782	1,258,879	937,987	2,059,041	4,029,195	4,565,515	25,924,699	117%
Upward - average price	350.20	380.21	247.21	331.94	246.50	193.87	282.43	299.84	340.70	506.63	458.16	384.89	349.11	107%
Downward - cost	217,863	365,440	373,164	-2,106	376,011	148,070	69,234	-47,092	-88,030	178,767	211,192	232,123	2,034,636	44%
Downward - average price	40.30	121.94	81.74	-0.52	78.45	29.64	27.17	-13.47	-33.01	68.60	110.81	127.71	48.64	55%
Imbalance BiH														
Shortage - total	14,590	7,025	7,023	9,411	5,778	5,664	10,432	9,293	8,611	12,864	14,417	16,210	121,318	137%
Shortage - max hourly	99	67	61	97	92	86	77	154	103	106	94	118	154,32	17%
Surplus - total	1,638	3,818	3,910	4,465	7,470	6,602	3,647	5,829	6,046	5,972	2,213	1,177	52,785	127%
Surplus - max hourly	47	97	104	199	110	86	66	129	70	142	64	43	198,80	103%
Price shortage - average	282.29	255.48	204.62	232.11	174.72	176.26	193.20	197.41	198.47	228.74	262.45	274.15	223,13	115%
Price shortage - maximum	960.00	950.00	890.00	980.00	890.00	979.00	980.00	850.00	920.00	2,933.75	2,654.06	980.00	2,933,75	179%
Price surplus - average	70.64	92.44	92.00	76.68	73.22	51.27	75.20	53.43	57.79	87.03	94.99	93.70	76,47	104%
Price surplus - minimum	-400.00	-400.00	-400.00	-400.00	-400.00	-2,014.50	-400.00	-400.00	-400.00	-400.00	-400.00	-50.00	-2,014,50	504%

Transmission losses and FSkar process

In 2025 energy to cover transmission system losses was procured through regulated procedures. The total cost of this service in 2025 was 69 022 087 KM, which is over 13% higher in comparison to last year (Table 9).

The process of financial settlement of deviations between LFC Areas of Continental Europe – FSkar process includes unintended exchange, energy from the frequency containment process (FCR) and ramping period. Because of the FSkar process, NOSBiH is due to pay 15,5 million KM for the year 2025, which is 23% more in comparison to the previous year.

Cross-border balancing energy exchange

Based on the Agreement on the joint reserve in the Slovenia-Croatia-Bosnia and Herzegovina LFC block, the capacity of mFRR which was to be provided in 2025 within the BiH Control area was 196 MW for upward regulation, and 68 MW for downward regulation. In 2017 Agreement on cross-border exchange of balancing energy was also signed with Serbian Transmission System Operator – EMS, and in 2018 the same Agreement was signed with the Transmission System Operator in Montenegro – CGES.

Table 10 shows the values of exchanged cross-border balancing energy in 2025 with the expenses included. Image 3 shows the share of certain system operators in total cross-border exchange of balancing energy with BiH.

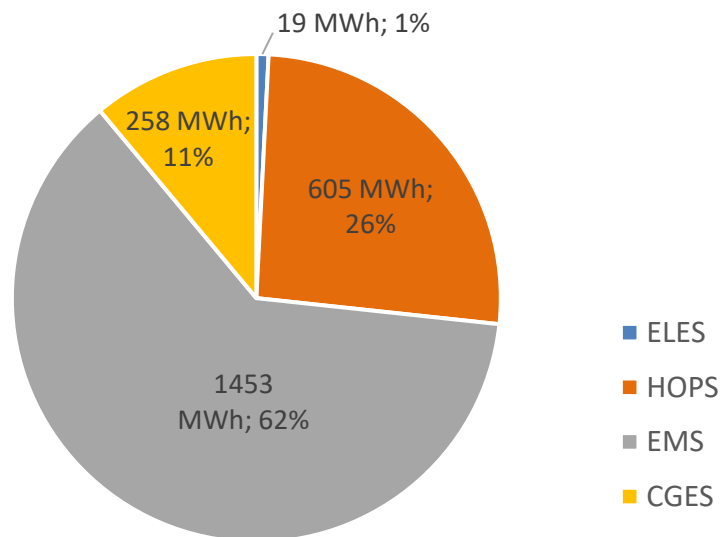


Image 3: Cross-border exchange of balancing energy

Table 9: Report on transmission losses and Fskar process for 2025

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
Losses <i>MWh</i>	33,447	27,730	31,297	24,966	24,473	27,797	27,529	25,026	25,174	26,828	35,894	35,538	345,698	104%
Reference price <i>KM/MWh</i>	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	198,77	108%
Cost <i>KM</i>	6,559,211	5,583,648	5,885,778	5,633,341	6,287,493	5,525,210	5,101,233	6,248,335	5,343,335	5,743,062	5,416,880	5,694,562	69,022,087	113%
Cost Fskar <i>KM</i>	2,607,422	1,027,269	696,352	1,057,328	-101,495	141,901	1,185,763	765,528	740,491	1,717,870	2,535,168	3,158,199	15,531,795	123%

Compensations: "-" direction - acceptance, "+" direction - giving

Table 10 : Report on cross-border balancing energy exchange for 2025

Energy engaged in BiH for other TSOs needs														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24
XB Exchange - Import <i>MWh</i>	0	0	0	0	0	0	0	0	0	18,75	18,75	18,75	18,75	2%
Price Import Average <i>KM /MWh</i>										-400	-400	-400	-400,00	120%
Cost Import <i>KM</i>										-7,500	-7,500	-7,500	-7,500	3%
XB Exchange - Export <i>MWh</i>	74	54	493	30	0	68	0	719	200%					
Price Export Average <i>KM /MWh</i>	831	799	876	790	563								832,23	101%
Cost Export <i>KM</i>	61,498	43,125	431,775	23,700	38,275								598,373	201%
Engaged cross-border energy for BiH needs														
XB Exchange - Import <i>MWh</i>	20	273	20	15	25	20	347	164	884	48%				
Price Import Average <i>KM /MWh</i>	799,93	427,79	650,90	611,04	496,04	2,933,75	1,145,05	373,49	774,33	120%				
Cost Import <i>KM</i>	15,999	116,786	13,018	9,166	12,401	58,675	396,951	61,252	684,248	57%				
XB Exchange - Export <i>MWh</i>	110	307	156	75	65	713								
Price Export Average <i>KM /MWh</i>	0,20	0,20	-225,81	0,20	0,20	-225,01								
Cost Export <i>KM</i>	22	61	-35,226	15	13	-35,115								

Conclusion

All required balancing services capacity for 2025, apart from aFRR capacity in off peak load periods, were procured in public procurement procedures mostly in the annual tender.

In relation to the year 2024, similar prices of balancing capacities were realized for aFRR and for mFRR. The realized prices of balancing capacities were significantly below the regulated price-caps, except for the price of aFRR in peak load and off-peak load periods.

The worst availability of balancing capacities, as in previous years, was achieved for the aFRR service at night. In 2025, around 34% of the required capacity was delivered. A slightly better availability was achieved for the aFRR reserve in periods of peak load, and it amounted to 41%, while the availability of the upward and downward mFRR reserves reached 71% and 78% respectively. The dominant providers of balancing services are three public power utilities with their balancing capacities.

In contrast to balancing capacities, the price of upward balancing energy in 2025 was higher compared to 2024, while the price of downward balancing energy was lower in comparison to 2024. In 2025, about 1597 MWh of cross-border balancing energy was activated for the needs of the LFC Area of BiH. At the same time, NOSBiH, in line with its possibilities, delivered balancing energy to the neighboring system operators.

Imbalance prices were in line with balancing energy prices and in average amounted to 223.13 KM/MWh for realized energy shortage, i.e., 376.47 KM/MWh for realized energy surplus. This prices are higher than last year's imbalance prices.

The cost of energy to cover transmission losses is 4% higher than in 2024. The energy required to cover losses for the entire year was procured through market procurement procedure, and the average price of energy to cover losses in 2025 amounted to 198.77 KM/MWh, compared to KM 183.96/MWh in 2024.

Bad hydrological situation and problems in delivery of electricity from most thermal power plants, marked the year 2025. There was a significant deficit of energy in the amount of 121 GWh and a surplus of energy of 53 GWh. As for the settlement between transmission system operators – FSkar process, the cost was approximately 25% higher than in last year.

Considering the actual tariff for system services, based on ancillary services and the balancing market the amount of 4.5 million KM of expense was realized in 2025.

Appendix: Financial overview

Table 11: Financial balance - ancillary services and balancing energy in 2025

Control capacity															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
FCR - capacity	KM	-78.797	-71.172	-78.691	-76.255	-78.797	-76.255	-78.797	-78.797	-76.255	-78.903	-76.255	-78.797	-927.772	
FCR - capacity - penalty	KM	0	0	0	0	0	0	0	0	0	0	0	0	0	
aFRR - capacity	KM	-804.233	-549.904	-621.972	-550.888	-468.639	-441.588	-500.035	-392.898	-236.714	-308.728	-417.478	-635.123	-5.928.202	86,80%
aFRR - capacity - penalty	KM	71.836	70.762	69.921	67.055	65.515	68.567	83.218	91.066	92.174	95.731	93.200	79.835	948.880	118,53%
mFRR upward - capacity	KM	-470.073	-465.032	-539.501	-349.842	-594.457	-787.986	-805.472	-699.063	-641.973	-525.935	-373.553	-377.785	-6.630.672	98,22%
mFRR upward - capacity - penalty	KM	38.343	26.799	24.799	57.406	15.040	23.704	28.802	40.908	48.698	39.707	52.967	56.367	453.540	122,64%
mFRR downward - capacity	KM	-46.441	-40.875	-45.094	-37.510	-23.894	-29.084	-38.108	-38.432	-27.137	-38.256	-39.761	-48.457	-453.051	66,68%
mFRR upward - capacity - penalty	KM	496	664	754	2.174	5.800	3.991	2.431	2.113	1.328	4.931	1.526	89	26.297	112,32%
Total	KM	-1.288.871	-1.028.757	-1.189.785	-887.861	-1.079.433	-1.238.652	-1.307.962	-1.075.103	-839.878	-811.452	-759.354	-1.003.872	-12.510.979	89,94%
Positive values are invoiced by NOSBIH and paid by BSP, negative values are paid by NOSBIH and invoiced by BSP															
Engaged energy															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Upward	KM	-3.066.494	-2.548.574	-1.551.499	-2.835.380	-854.375	-612.978	-1.604.782	-1.258.879	-937.987	-2.059.041	-4.029.195	-4.565.515	-25.924.699	117,13%
Downward	KM	217.863	365.440	373.164	-2.106	376.011	148.070	69.234	-47.092	-88.030	178.767	211.192	232.123	2.034.636	44,05%
Total	KM	-2.848.631	-2.183.133	-1.178.334	-2.837.486	-478.364	-464.909	-1.535.549	-1.305.971	-1.026.017	-1.880.274	-3.818.003	-4.333.391	-23.890.063	136,40%
Positive values are invoiced by NOSBIH and paid by BSP, negative values are paid by NOSBIH and invoiced by BSP															
Imbalance															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Surplus	KM	-179.769	-181.725	-438.744	-312.365	-258.213	-287.126	-238.314	-155.423	-246.646	-329.640	-341.348	-149.924	-3.119.236	101,77%
Shortage	KM	7.361.757	5.356.972	3.739.575	7.005.240	3.850.469	3.594.278	4.505.906	5.817.842	4.247.467	6.204.823	6.862.464	8.723.543	67.270.335	132,63%
Total	KM	7.181.988	5.175.246	3.300.831	6.692.874	3.592.257	3.307.152	4.267.593	5.662.419	4.000.821	5.875.183	6.521.116	8.573.619	64.151.099	134,62%
Positive values are invoiced by NOSBIH and paid by BSP, negative values are paid by NOSBIH and invoiced by BSP															
Losses and FSkar															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Losses		-6.559.211	-5.583.648	-5.885.778	-5.633.341	-6.287.493	-5.525.210	-5.101.233	-6.248.335	-5.343.335	-5.743.062	-5.416.880	-5.694.562	-69.022.087	113,23%
FSkar		-2.607.422	-1.027.269	-696.352	-1.057.328	101.495	-141.901	-1.185.763	-765.528	-740.491	-1.717.870	-2.535.168	-3.158.199	-15.531.795	123,47%
Total	KM	-9.166.633	-6.610.917	-6.582.130	-6.690.669	-6.185.998	-5.667.111	-6.286.996	-7.013.862	-6.083.826	-7.460.932	-7.952.048	-8.852.760	-84.553.882	114,98%
Positive values are invoiced by NOSBIH and paid by BSP, negative values are paid by NOSBIH and invoiced by BSP															
System service															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Total	KM	5.347.791	4.839.494	4.566.651	4.018.556	3.708.462	3.652.334	3.931.305	3.810.635	3.609.171	4.395.989	4.796.357	5.644.286	52.321.032	99,69%
Positive values are invoiced by NOSBIH and paid by market participants															
Balance															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2025	2025/24	
Total	KM	-774.355	191.933	-1.082.767	295.414	-443.075	-411.185	-931.609	78.118	-339.729	118.514	-1.211.933	27.881	-4.482.794	92,93%
Positive value - NOSBIH's surplus of assets															