Wholesale Electricity Market Monitoring Report for the Energy Community Contracting Parties

April 2020
For the reporting period of 2017-2018

Contents

ist of Tables

List of Figures

`

INTRODUCTION

1. About ECRB

The Energy Community Regulatory Board (ECRB) operates based on the Energy Community Treaty. As an institution of the Energy Community (EnC)[1] ECRB advises the Energy Community Ministerial Council and the Permanent High Level Group on details of statutory, technical and regulatory rules and makes recommendations[2] in the case of cross-border disputes between national regulators authorities (NRAs).

2. Background

Market monitoring is a core element of regulatory responsibilities. Only in-depth knowledge of market dynamics, stakeholders' activities and development outlooks allow regulators to create an effective market framework that balances the interests of market players and is able to promote competition, energy efficiency and investments, ensuring consumers' protection and security of supply at the same time. The relevance of market monitoring is not only recognized by the Energy Community acquis communautaire[3] but has also already been in the centre of ECRB activities during the past years.

Based on a workshop held in 2014 with the support of the Agency for the Cooperation of Energy Regulators (ACER), ECRB decided to initiate a monitoring activity mirroring the one of ACER[4] and to prepare a Market Monitoring Report that assesses the electricity markets in and between the Energy Community Contracting Parties (CPs).

3. Scope of the report

The present report covers the Energy Community Contracting Parties **Albania, Bosnia and Herzegovina, Georgia, Kosovo*, Moldova, Montenegro, North Macedonia, Serbia** and **Ukraine**. It describes the status quo of wholesale electricity market with the aim to identify potential barriers and discuss recommendations on potential improvements. Data presented in this report refers to the year **2018.**

Aim of the report is to mirror ACER/CEER Market Monitoring indicators though with some caveats having in mind data availability and market development in the CPs. This report is third market monitoring report covering 2017-2018 year.

4. Methodology

Data and analysis provided in this report is based on information provided by the NRAs from CPs for their respective markets through specially designed data collection forms. In addition, methodological

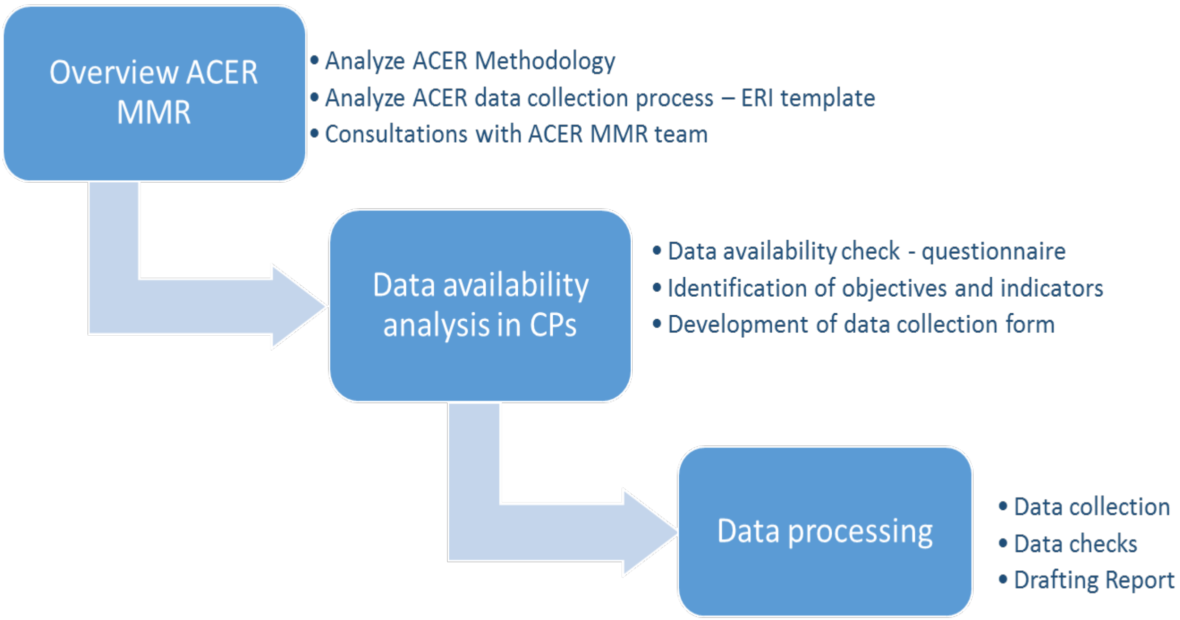
1 www.energy-community.org. The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, North Macedonia, Kosovo*, Moldova, Montenegro, Serbia, Georgia,and Ukraine. Armenia, Turkey and Norway are Observer Countries. **Throughout this document the symbol * refers to the following statement: "This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Advisory opinion on the Kosovo declaration of independence*."

2 The work of the ECRB is supported by the ECRB Section at the Energy Community Secretariat.

3 Decision of the Ministerial Council of the Energy Community D/2011/02/MC-EnC incorporating the Third Package in the Energy Community acquis (*ref.* Article 37 Directive 2009/72/EC).

4 http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2015.pdf.

explanations/recommendations were received through communication with ACER market monitoring experts. The process description of how this Wholesale Electricity Market Monitoring Report was developed is presented below.



In line with the structure of the ACER MMR, the report is structured as follows: **Chapter 1** provides information on the level of market integration and key developments; **Chapter 2** and **Chapter 3** describes available cross zonal transfer capacities and efficient use of those transfer capacities; **Chapter 4** addresses balancing market development. **Summary of findings** concludes the report with the main observations for further analysis and actions. The criteria used in the report were grouped into the corresponding four sections outlined in table 1.

Table 1. List of indicators

Section	Indicators
Key Developments	• Number of Wholesale market participants • Peak demand and consumption
Available Cross zonal capacity	• Available cross border net transfer capacities in absolute values • Ratio between available net transfer capacity (NTC) and aggregated thermal capacity of interconnectors • Allocated capacity on day ahead (DA) and intraday (ID) timeframes as a % of offered capacity

Efficient Use of Cross-Zonal Capacity	• Level of DA cross-zonal trade per year • Level of ID cross-zonal trade per year • ID traded volumes as a percentage of electricity demand • Evolution of the annual level of commercial use of interconnections (day-ahead) as a percentage of NTC values • Evolution of the annual level of commercial use of interconnections for all timeframes as a percentage of NTC values • Congestion revenues
Balancing	• Evolution of balancing electricity prices • Market share of the largest provider of balancing energy and reserve capacity for all types of reserves • Balancing capacity contracted abroad as a percentage of the system requirements of reserve capacity • Balancing energy activated abroad as a percentage of the amount of total balancing energy activated (%) • Activated balancing energy from all type of reserves • Balancing energy activation costs for all type of reserves

Findings

1. Key Developments

According to ACER's market monitoring report, the day-ahead hourly wholesale price is the kay factor to evaluate electricity market integration and cross-border trade efficiency. The wholesale price convergence, as an indicator, shows the level of market integration, which depends on the available transmission capacity and their efficient use of interconnectors. While trying to mirror ACER's approach, it became obvious that the same level of analysis for CPs are not possible in the absence of day-ahead hourly market index. In the absence of such index the markets are prone to inefficiencies which results with the lack of correlation. Consequently, for the purpose of this report, as in previous reports, the analyses regarding the wholesale market price convergence of CPs have not been performed in this report as well.

Gross electricity consumption and peak load in the Energy Community CPs increased slightly in 2018 compared to previous years. The figures below present aggregate consumption and load characteristics together with the evolution of market participants in the CPs.

Figure 1 Electricity load and consumption characteristics in a selection of Contracting Parties – 2015- 2018 (MW and MWh)

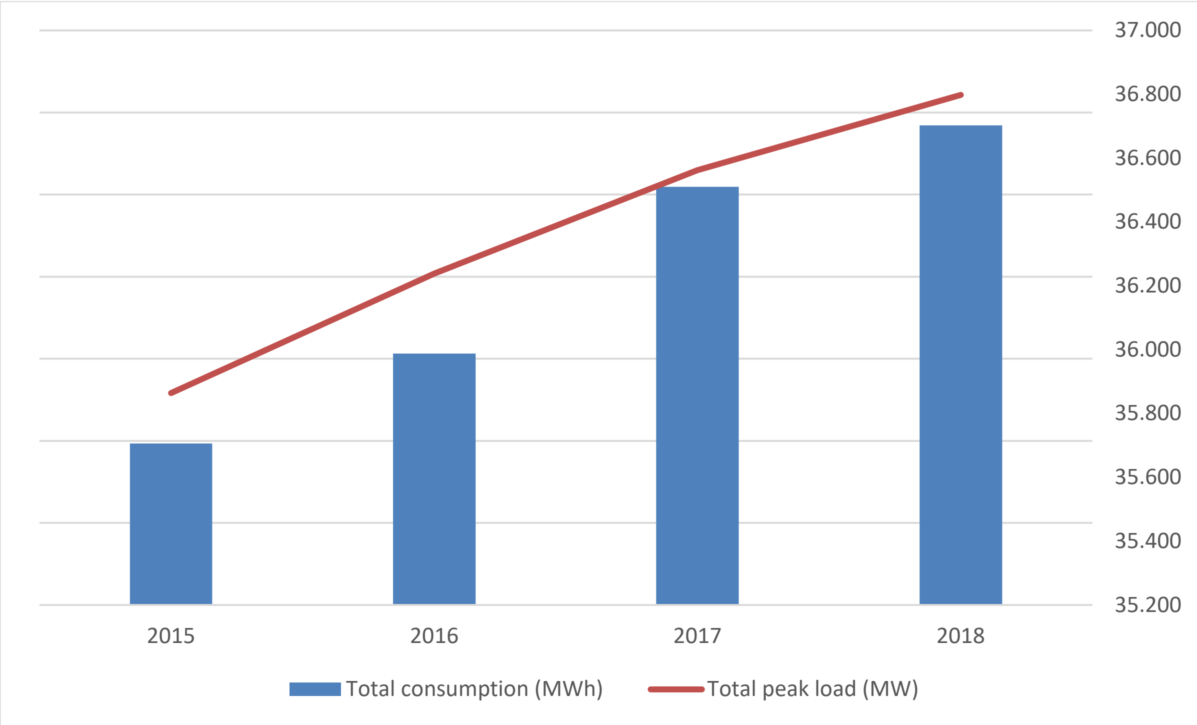
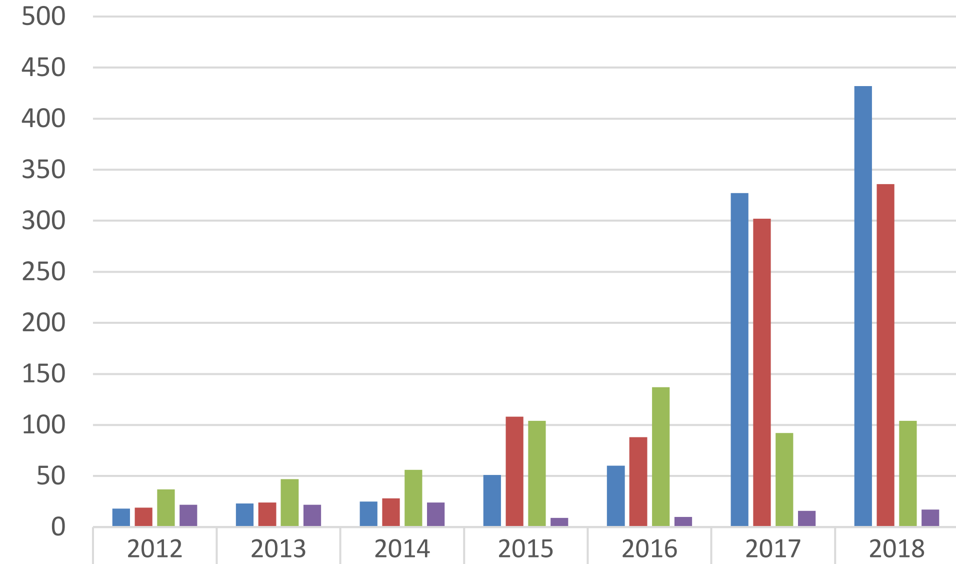


Figure 2 provides an overview of market participants. A **constant increase of market participants** is observed in all CPs. An increase of suppliers was caused by partial market opening in Energy Community Contracting Parties. However, rapid increase in the period of 2017-2018 in the number of market participants is caused by adding data from Ukraine for the same years.

Figure 2. Evolution in numbers of electricity market participants in Contracting Parties[5] – 2012-2018 years.



	2012	2013	2014	2015	2016	2017	2018
Generator	18	23	25	51	60	327	432
Supplier	19	24	28	108	88	302	336
Trader (other than supplier)	37	47	56	104	137	92	104
Elligible consumer	22	22	24	9	10	16	17

2.Available cross zonal capacity

In the reporting period, despite some improvements, the increase in tradable cross-zonal capacities in EnC CPs remained limited. Figure 5 presents average available cross-zonal NTC values aggregated per selection of CPs for 2015-2018. [6] All borders are included (In case of Georgia only border with Turkey is included). According to the data reported, NTC didn't change substantially in the EnC border and the changes in the abovementioned markets are reasoned by annual adjustments of NTC calculation.

For an efficient cross border trade, the only limiting factor to trade should be the capacity of the network elements (i.e. the interconnection lines). Therefore, the difference between the NTC and the thermal capacity of interconnectors on the borders can be a starting point to assess the efficiency of current zonal delimitation. This relation can indicate the potential scope for increasing the NTC values if internal network elements should not be taken into account to limit cross-zonal exchanges. Available capacities on High-Voltage Alternating Current (HVAC) interconnectors are affected by additional factors such as loop flows, N-1 security criterion and reliability margins (RMs).

[5] Albania and Moldova not included.
[6] NTC values for Montenegro is missing for 2016 year. For further calculations, 2015 year NTC value will be used for 2016 year for Montenegro assuming that the same level of NTC remains in 2016.

Figure 3. NTC averages of both directions on the selection of CP borders, 2015–2018 (MW)

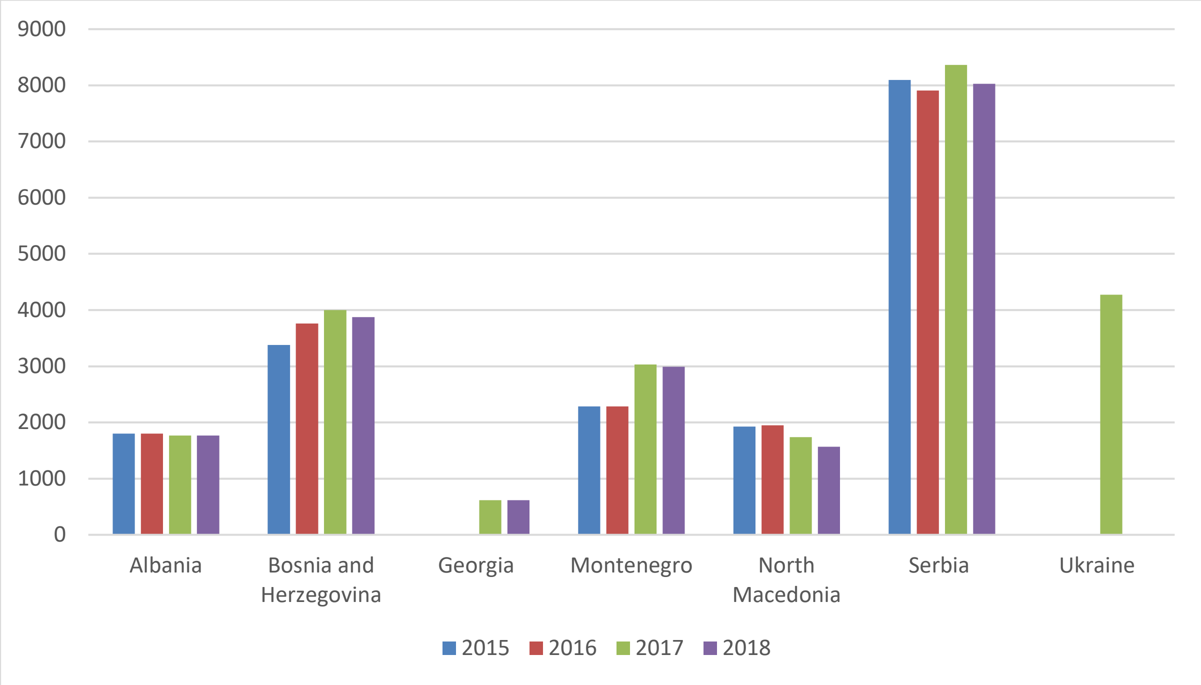
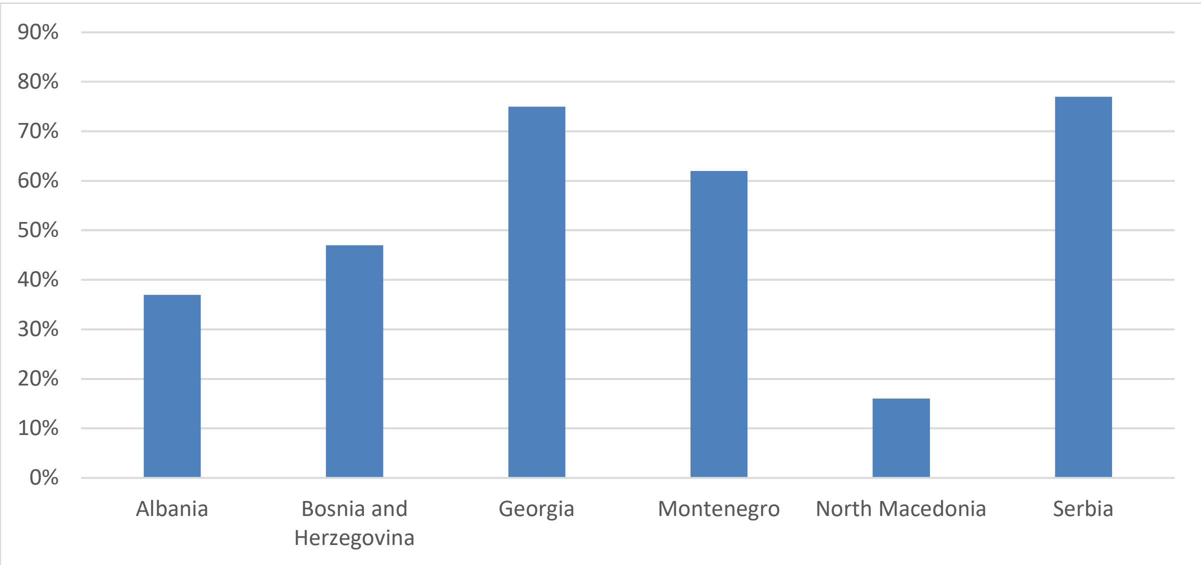


Figure 4 presents the ratio between the monthly NTC for 2018 and the aggregated thermal capacity of cross-zonal interconnectors. Usage in percentage of total capacity for trade in the region for non-meshed networks is higher than average European value[7]. Figure 5 shows available capacity usage in day-ahead and intra-day timeframes.

Figure 4. Ratio between available NTC and aggregated thermal capacity of interconnectors - 2018[8]

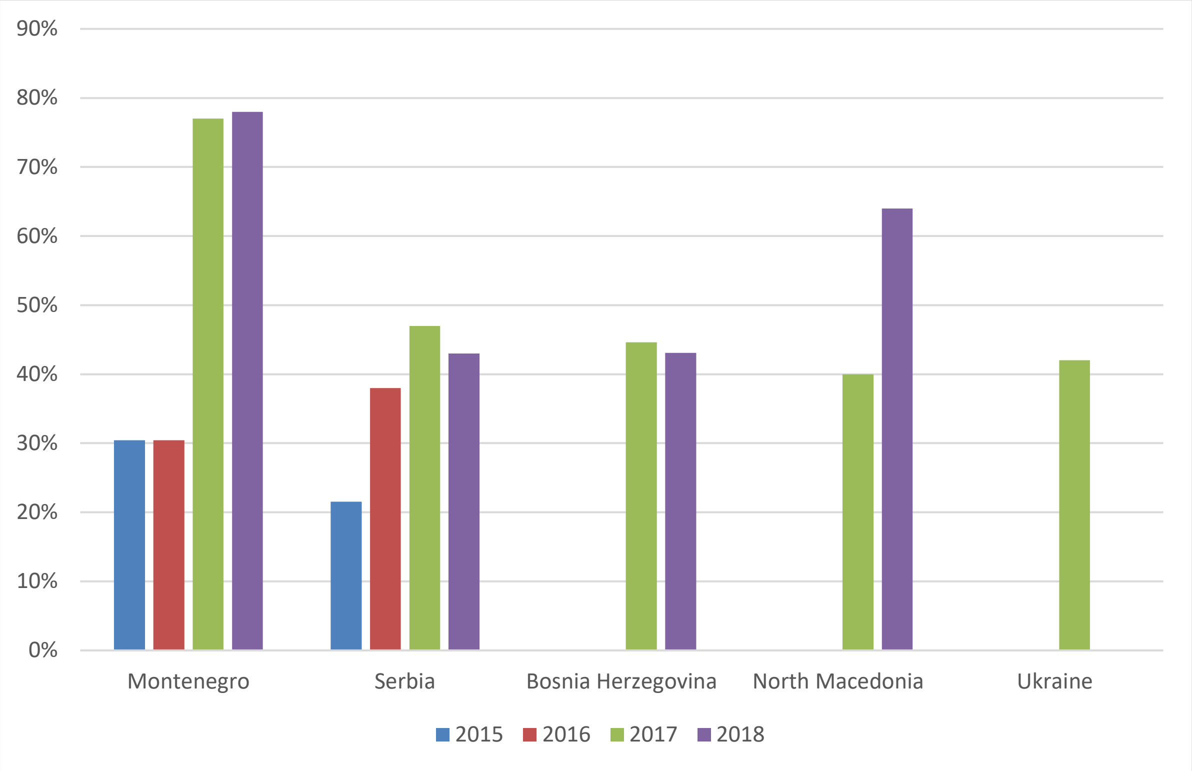


[7] https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Market%20Monitoring%20Report%202015%20-%20ELECTRICITY.pdf (page 17).

[8] Only Akhaltsikhe-Borchkha interconnector is included between Georgia and Turkey in the calculation

Despite Georgia keeps for high NTC level (considered only Turkey Border) compared to other CPs, there is no real day ahead/intraday allocation of that NTC on the market (see figure 5). Therefore, this indicator doesn't characterize interconnector utilization efficiency.

Figure 5. Allocated capacity on DA and ID timeframes as a % of offered capacity in the same timeframes (%) - 2015-2018



3.Efficient use of cross zonal capacity

In order to achieve an efficient cross-border exchange of energy, common standard products must be defined. This would allow to achieve sufficient liquidity and adequate competition in the markets where these products are traded. Coordinated cross-border capacity calculation and allocation is one of the cornerstones for starting to harmonize market participation requirements in order to integrate national markets while aiming to bring additional capacity to the market, reduce transaction costs, increase competition and transparency. It is important to analyze to which extent CPs are using harmonized methods or timeframes for cross-border transfer capacity calculation/allocation and to what extent the total transfer capability is utilized during commercial cross-border trade. In the following table the CPs' cross-border capacity calculation methods and timeframes are summarized.

Table 2. Cross-border capacity calculation methods in electricity

Contracting party	Frequency of capacity calculation	Capacity calculation methods	TTC with neighboring CPs (MW)
Albania	Year ahead Month ahead	Pure bilateral NTC	4792
Bosnia and Herzegovina	Year ahead Month ahead	Pure bilateral NTC	4400
Montenegro	Year ahead Month ahead	Pure bilateral NTC	4810
Serbia	Year ahead Month ahead	Pure bilateral NTC	10400
Albania	Calculations are performed for Yearly and Monthly NTC	Pure bilateral NTC	3303
North Macedonia	Year ahead Month ahead	Pure bilateral NTC	5425
Georgia	Year ahead Month Ahead	Pure bilateral NTC	2400
Ukraine	Year ahead Month Ahead	Pure bilateral NTC	

Figures 6 and 7 show the day-ahead and intraday cross border trade level for a selection of EnC CPs. According to the figures, **low utilization levels of intraday cross border capacities compared to the day-ahead timeframe** are obvious, despite increasing volumes at intraday timeframes. Increasing intraday trade is also essential for the development of intermittent power sources in order to incentivize them in the same way as conventional generation to reduce their imbalances.

Figure 6. Level of DA cross-zonal trade per year (absolute sum of net DA nominations for a selection of borders) – 2015–2018 (MWh)

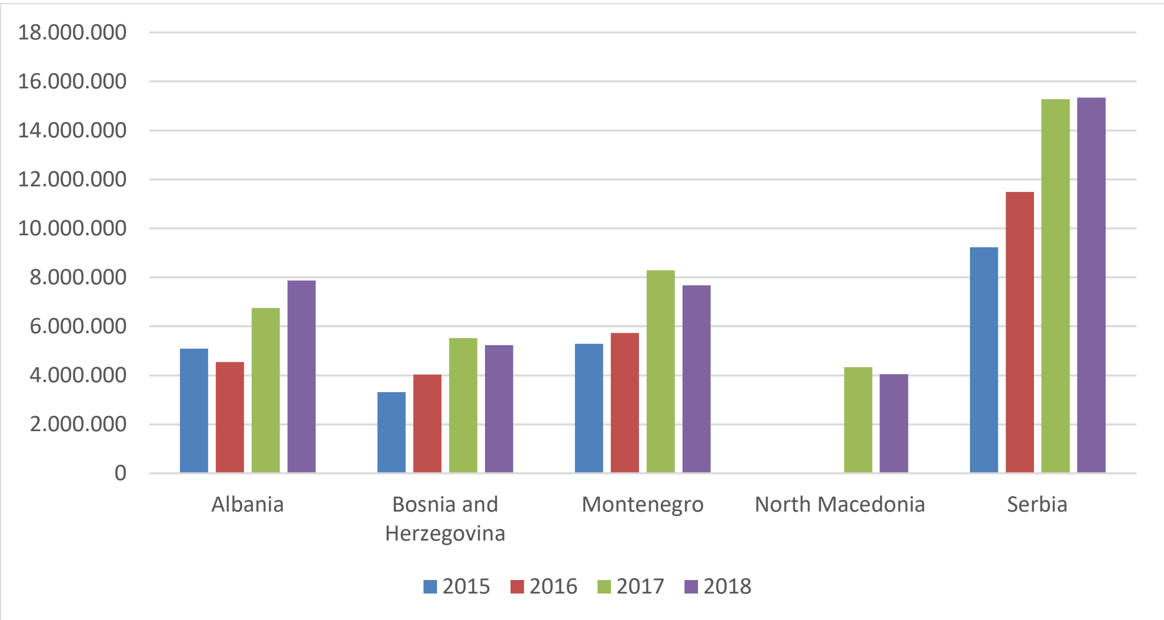


Figure 7. Level of ID cross-zonal trade per year (absolute sum of net ID nominations for a selection of borders) – 2015–2018 (MWh)

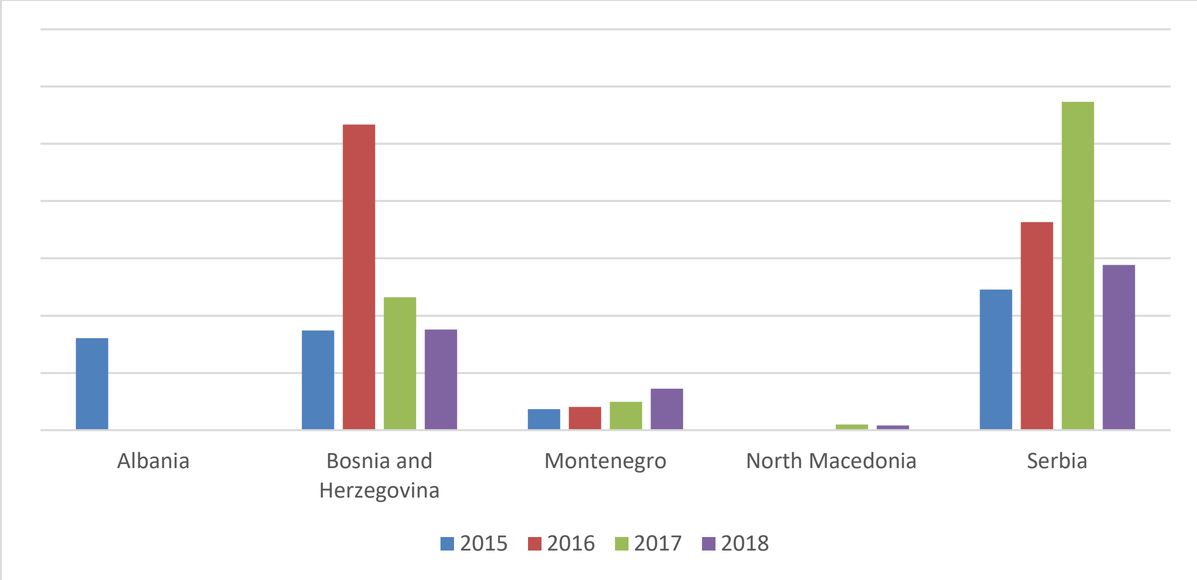
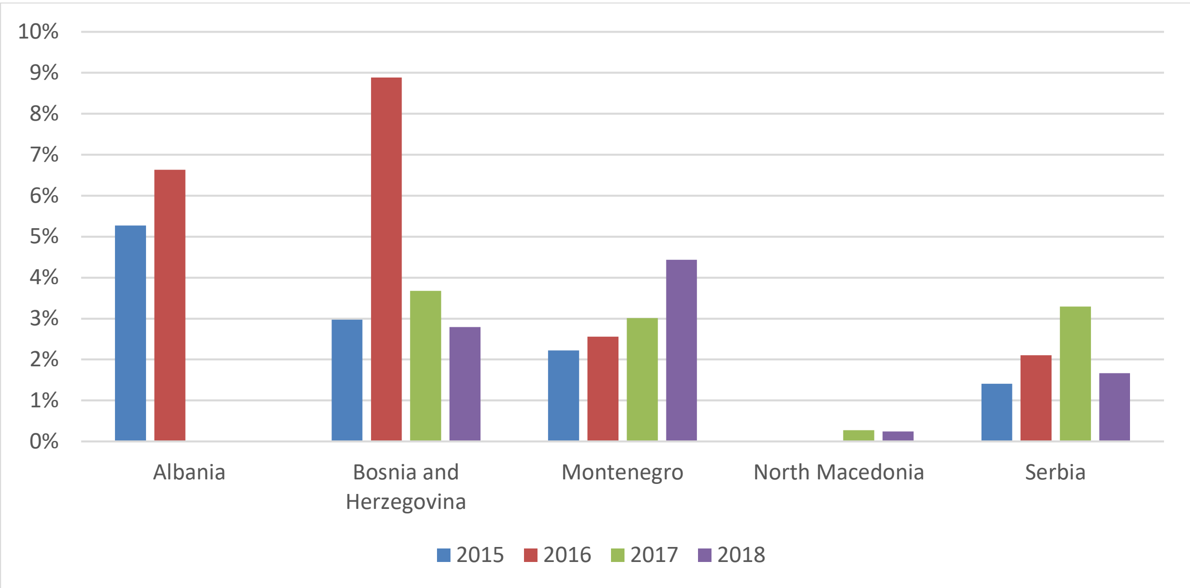


Figure 8 shows the ratio between ID traded volumes on cross border (commercial nominations)[9] and physical consumption across a selection of EnC CPs.

Figure 8. ID traded volumes as a percentage of electricity demand in a selection of EnC markets



The following figures provide an update on the use of existing cross-border transmission capacity for several timeframes and thereby present the level of commercial use of interconnections. Figure 9 shows the evolution of the commercial use of cross-border capacities at the day-ahead and intra-day

[9] Includes both directions (import-export).

timeframe (for both directions on each border). According to this figure, the **use of cross border capacity has slightly increased over year.** This could be due to a combination of reasons but it does not necessarily imply an efficiency increase in cross-border capacity utilization. Nevertheless, it highlights the **increasing importance of closer to real-time trade**, a trend that was already observed in the Energy Community's more developed electricity markets. For the calculation of figure 9 values, monthly NTCs were used (i.e. latest updated NTCs) as the transmission system operators (TSOs) in EnC CPs do not calculate NTCs on day ahead and intraday timeframes.[10]

Figure 9. Evolution of the annual level of commercial use of interconnections (day-ahead and ID) as a percentage of NTC values - 2015-2018 (%)

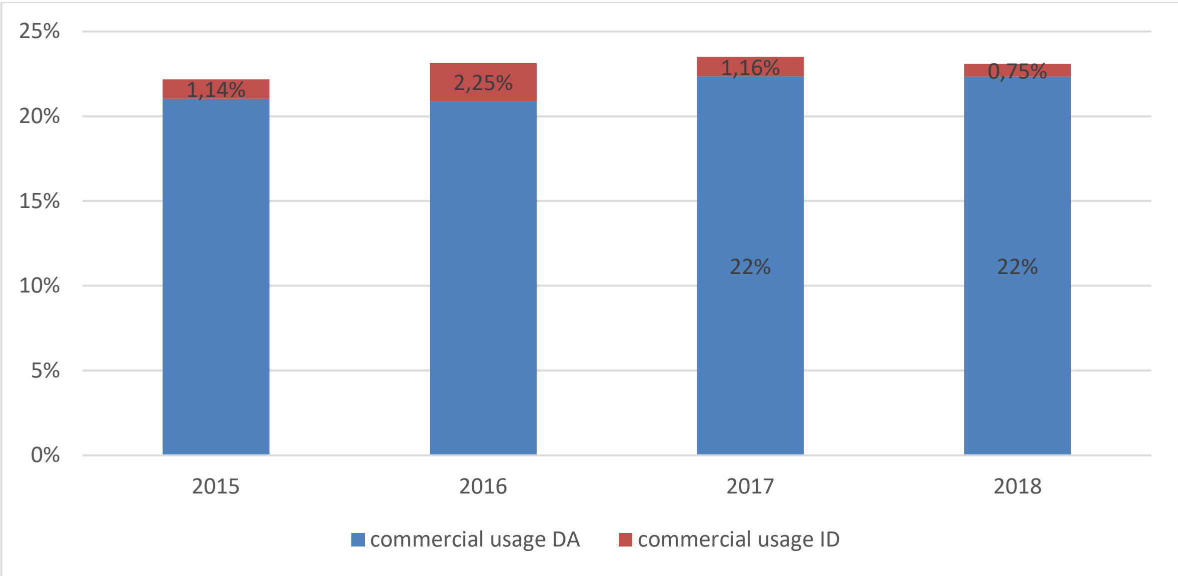
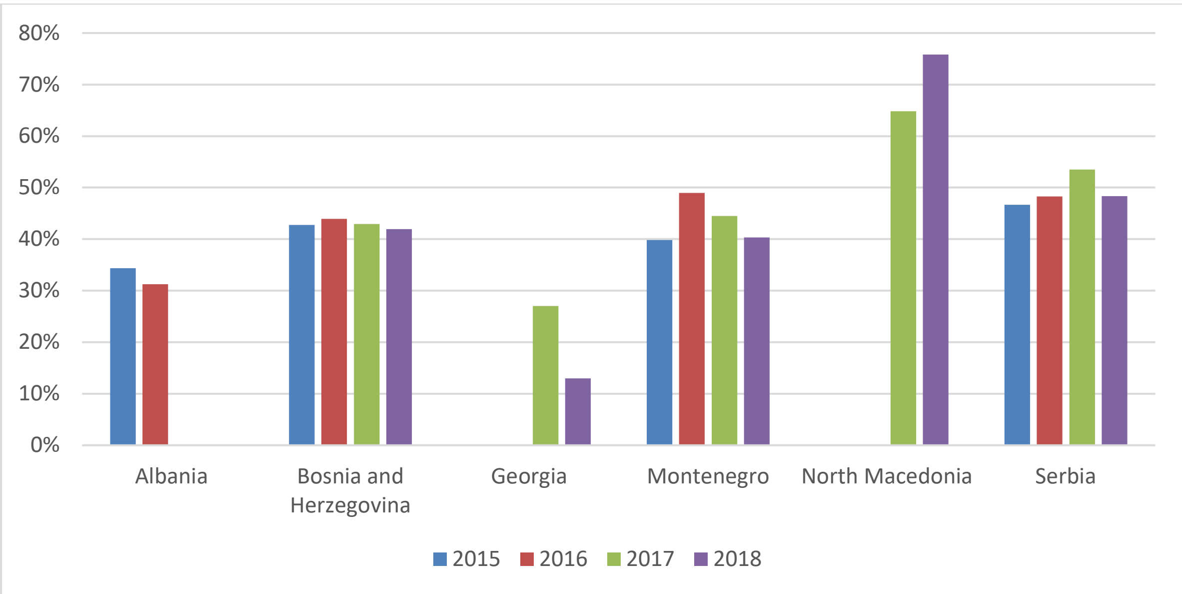


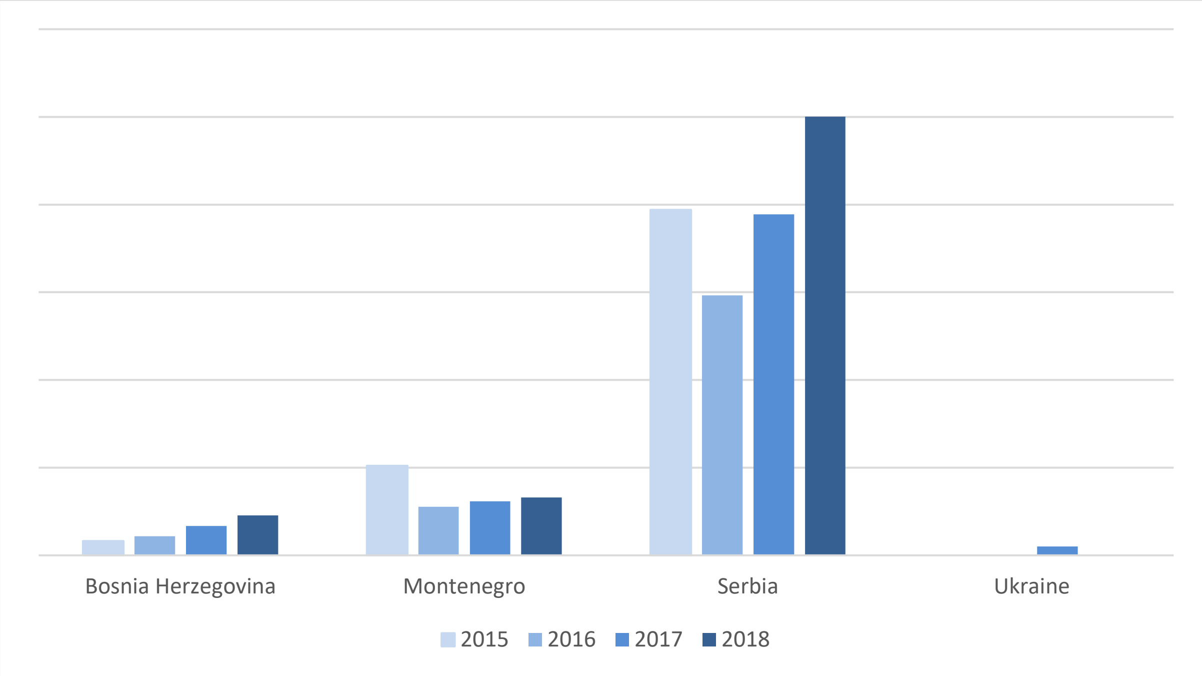
Figure 10. Evolution of the annual level of commercial use of interconnections of selection of EnC CPs for all timeframes as a percentage of NTC values - 2015-2018 (%)



[10] Monthly NTC usage in DA and ID commercial usage of interconnectors is based on ACER recommendation

The following figure shows congestion revenues. According to the data reports from Contracting Parties, all congestion revenue was taken into account as income by the NRAs when calculating network tariffs, so no revenues where used for redispatch, other remedial actions, grid reinforcement or servicing loans.

Figure 11. Electricity - congestion revenues for the selection of EnC markets[11] (Euros) – 2015-2018



4. Balancing

Electricity system balancing includes all actions and processes performed by a TSO in order to ensure that the total electricity consumption meets demand in a control area at any given moment, and, beside that, to keep system work in it its secure limits. Among others, adequate imbalance settlement and cross-border balancing exchanges are key elements for ensuring that systems are balanced in the most efficient way. An integrated cross-border balancing market aims at maximizing the efficiency of balancing by using the most efficient balancing resources. The following figures show the level of balancing market development and balancing market integration in the CPs.

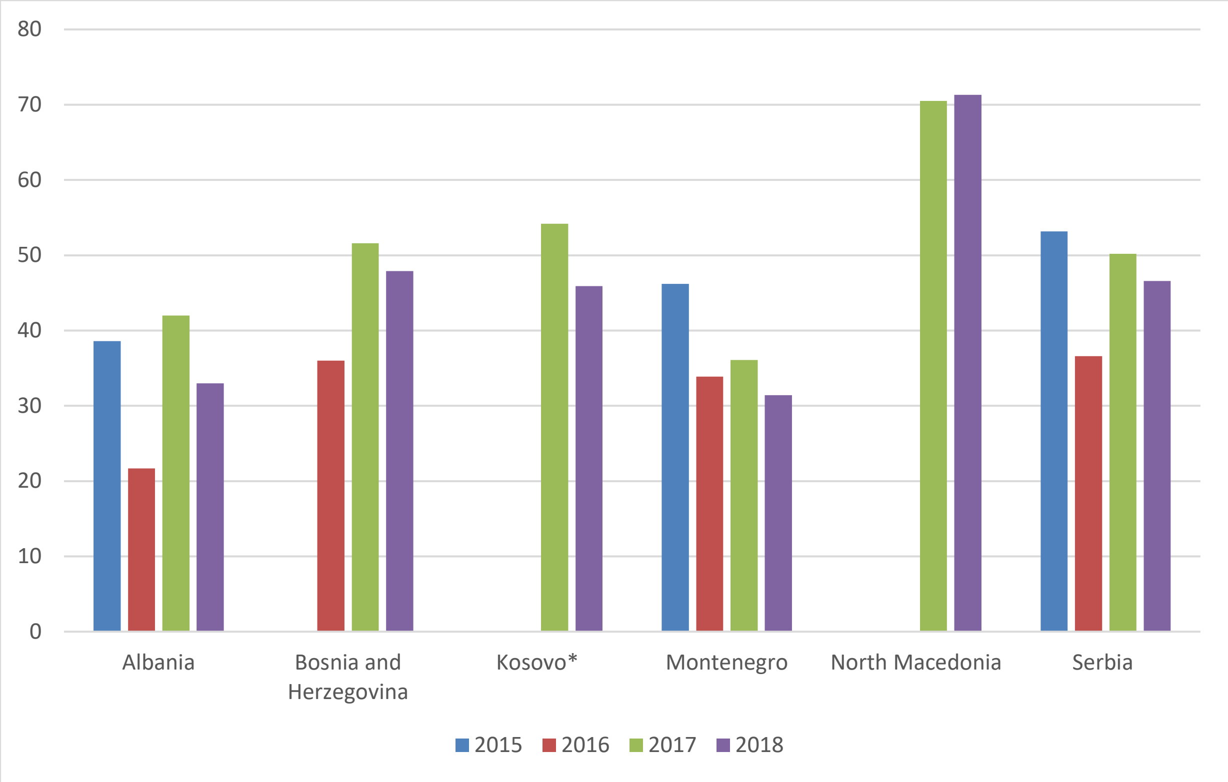
Balancing electricity price levels and their convergence can be treated as an indicator of regional balancing cooperation. Figure 12 provides an overview of the **development of balancing energy prices** over the last years. Annual prices are calculated based on the monthly averages of balancing prices in the EnC CPs.

High balancing energy price in North Macedonia coincided with the increase of average prices paid for contracted balancing reserve capacity. The regulatory authority of North of Macedonia in yearly

[11] Limitation in inclusion of all borders is due to data availability.

decisions approves prices for balancing capacity provided by the national generation company, ELEM[12] that is obliged to meet public services obligation and also include system services for the TSO. The main reason for the high balancing energy/capacity prices was an increase of fixed costs of ELEM for system services in recent years. The significant balancing energy price decrease in Bosnia and Herzegovina is associated with successful balancing market operation after its deregulation and increase of competition.

Figure 12. Evolution of balancing electricity prices at different markets of Contracting Parties - 2015-2018 (Euros/MWh)



Explanations for the price differentials among CPs is that the separate procurement of balancing reserves and energy does not exists in most countries and low balancing energy prices most probably result from either cross-subsidizing of the energy through the reserve payment or price regulation. Only separate procurement of both elements in a competitive market can lead to competitive prices for both services.

An integrated cross-zonal balancing market is intended to maximize the efficiency of balancing by using the most efficient balancing resources while safeguarding operational security. The figures below show information about balancing energy contracted abroad. They illustrate that the exchange of balancing services across the analyzed borders are currently limited and that low level cross border balancing cooperation result in divergence of balancing energy prices at national balancing markets.[13]

[12] www.elem.com.mk.

[13] Data used to calculate the percentages presented in this figure refer to balancing energy activated from all types of reserves. Data regarding such service sharing across border are not available for parties other than Serbia, fYR of Macedonia and Montenegro.

Figure 13. Balancing energy activated from neighboring balancing markets (MWh) in 2017-2018 years.

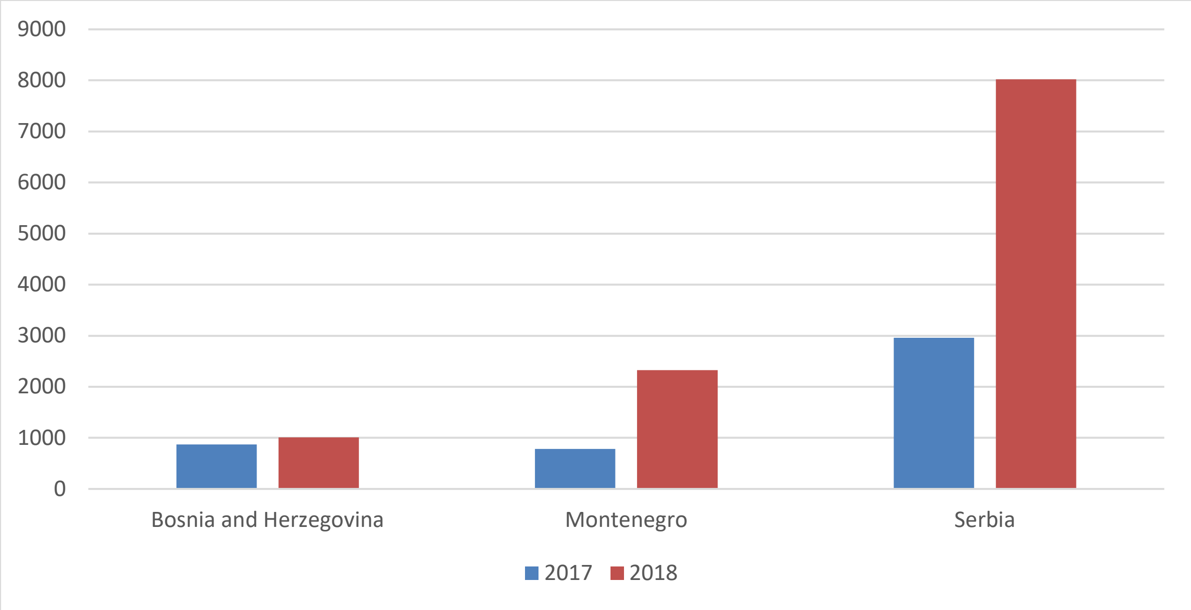


Figure 14 below shows activated balancing energy from all type of reserves and Figure 15 Balancing energy activation costs for all type of reserves.

Figure 14. Activated balancing energy from all type of reserves (upwards & downwards) in MWh - 2015-2018

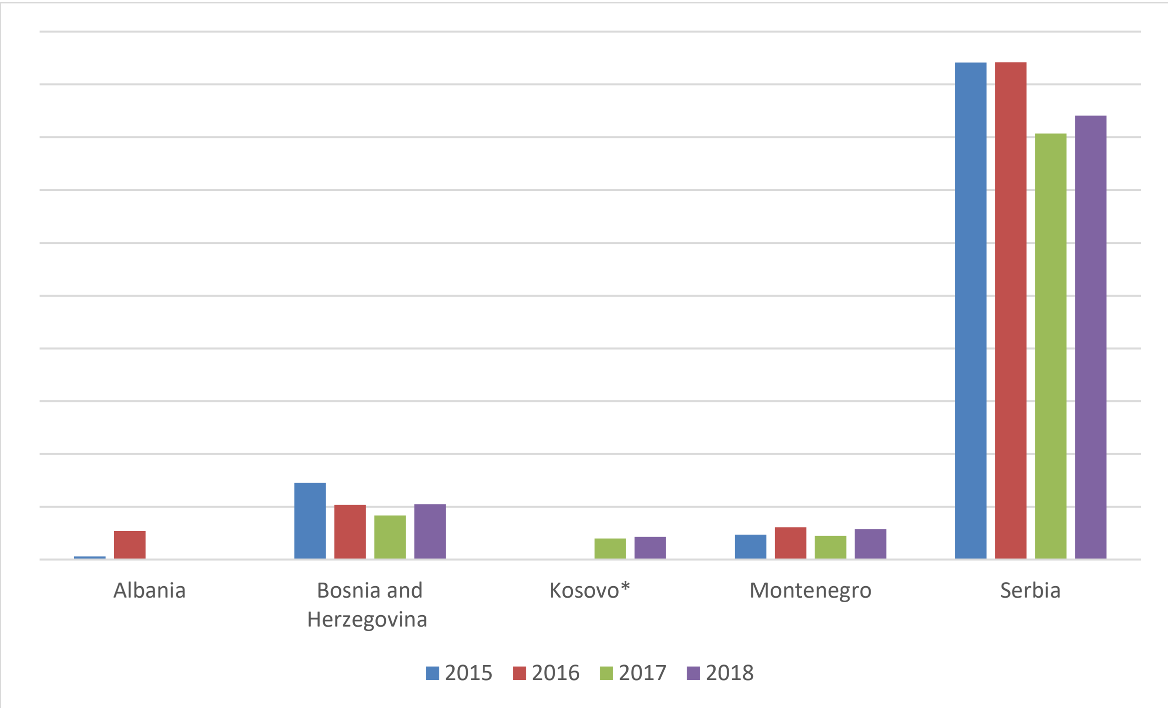
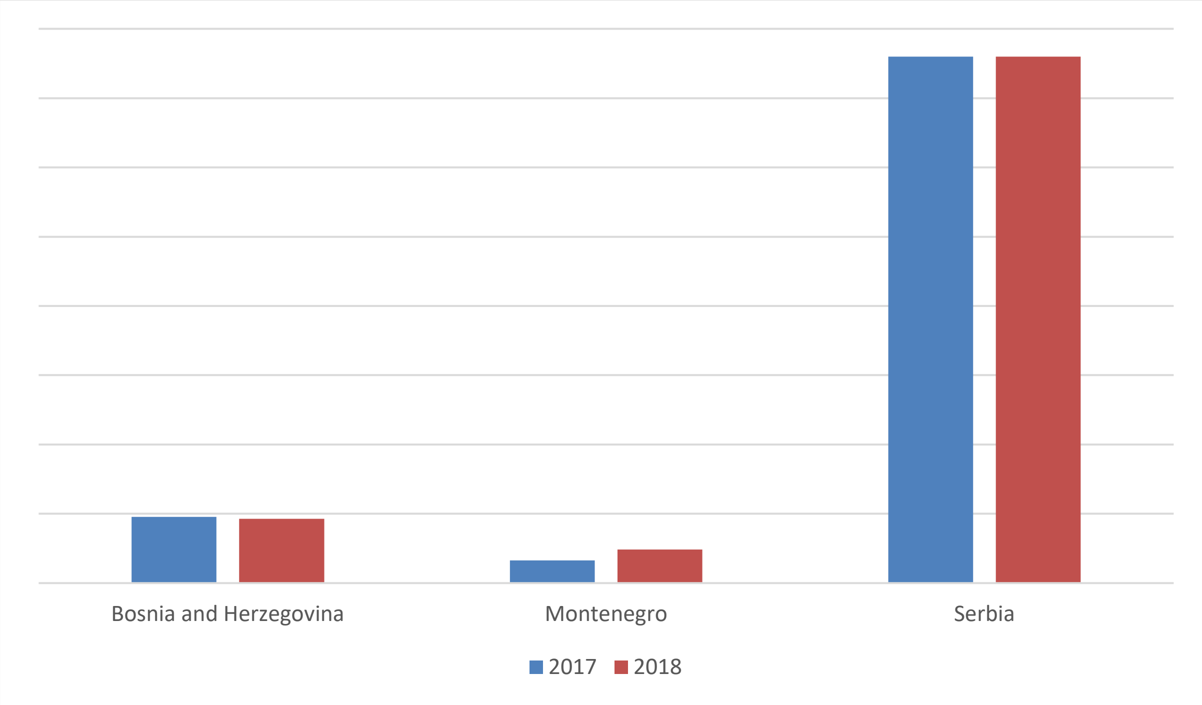
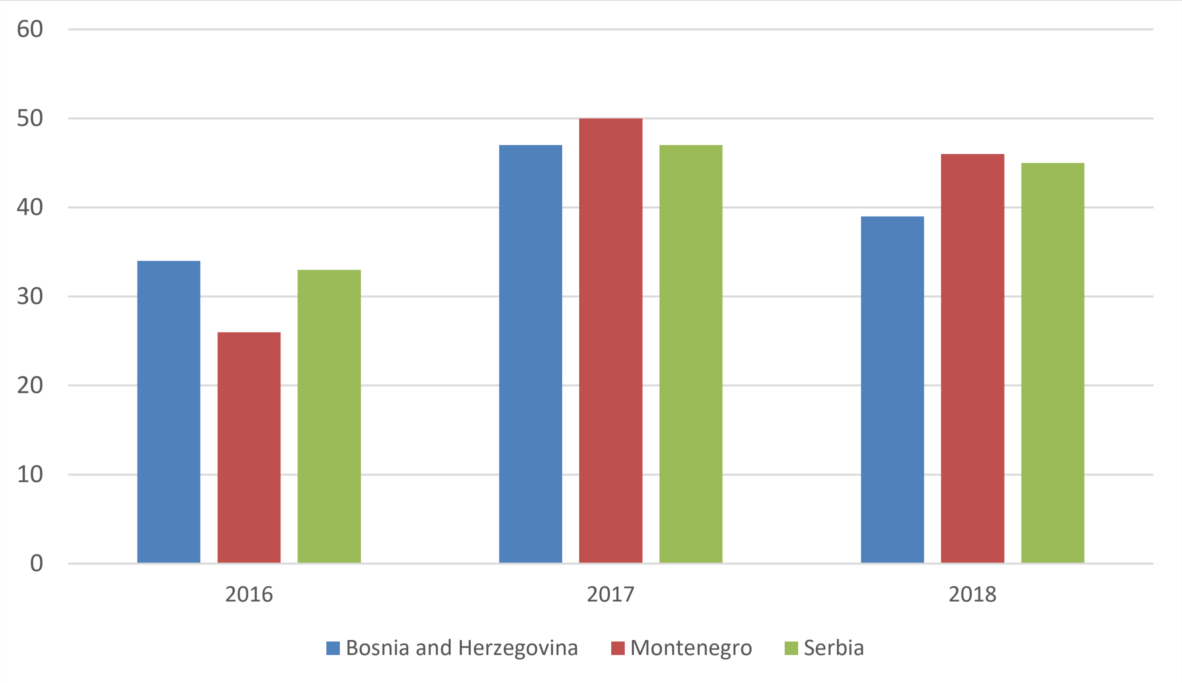


Figure 15. Balancing energy activation costs for all type of reserves (upwards & downwards) in Euros - 2017-2018



With the combination of 14th and 15th figure values, the overall costs of balancing per unit of activated balancing energy in selection of EnC markets can be calculated.

Figure 16. Balancing energy cost in a selection of EnC markets – 2016 - 2018 (Euros/MWh)[14]



[14] Due to the lack of data, imbalance prices and reserve capacity prices are not included in the calculation.

SUMMARY OF FINDINGS

1. The number of wholesale market participants and the traded volume of electricity at national or cross-border level continued to increase in EnC Contracting Parties, resulting in slightly converging electricity prices.

2. The report contains a section assessing the way in which cross-border capacity calculation is applied by TSOs. The results show that there is significant scope for electricity transmission networks to be used in a more efficient way and hence to make more cross-border capacities available to the market. For instance, at most of the assessed borders, the total transfer capacities are more than twice (and even more) as high as the tradable capacity. The report concludes that the lack of coordinated and efficient capacity calculation methods in the analysed period was one of the main shortcoming in achieving the efficient use of network infrastructure. Increasing the coordination of capacity allocation should result in better use of cross-border capacity.

3. Monitoring of day-ahead cross-border nominations shows a slight efficiency increase in the use of electricity interconnections. The report shows that a significant amount of cross-border capacity remains underutilized also due to absence of the day-ahead market. Establishment of day-ahead markets and implicit allocation of capacity through day-ahead market coupling would have positive impact on the utilisation of cross-border capacity.

4. The report shows that the level of intraday trade remains modest and represented more than 2% of total traded amount in the reporting period.

5. The report shows that further benefits could be obtained by increasing the cross-border exchanges of balancing energy and reserve capacity (including imbalance netting). The early implementation of the principles of the Guideline on Electricity Balancing[15], should contribute to balancing the systems more efficiently and the integration of balancing markets in the Contracting Parties. The report shows large disparities between prices of balancing services and in the average costs – including energy and capacity components.

6. Market integration is a key driver for price convergence. As national electricity markets in CPs remain highly concentrated and mostly characterized by small, incumbent dominated structures, establishing a regional market with price coupling is the only way to bring liquidity into the respective markets.

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2195&from=EN.