Wholesale Electricity Market Monitoring Report for the Energy Community Contracting Parties and Georgia

Reporting Period 2014

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INTRODUCTION

1. About ECRB

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

ECRB is the independent regional voice of energy regulators in the Energy Community. ECRB's mission builds on three pillars: providing coordinated regulatory positions to energy policy debates, harmonizing regulatory rules across borders and sharing regulatory knowledge and experience.

2. Background

Market monitoring is a core element of regulatory responsibilities. Only in-depth knowledge of market performance, stakeholder activities and development outlooks allow regulators to create an effective market framework that balances the needs of market players and is able to promote competition, customer protection, energy efficiency, investments and security of supply at the same time. The relevance of regulatory 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], adjusted to data availability and market development in the Energy Community Contracting Parties (CPs) and Georgia and to prepare a Market Monitoring Report that assesses the electricity markets in and between the respective jurisdictions.

3. Scope of the report

The present first Wholesale Electricity Market Monitoring Report for the Energy Community Contracting Parties and Georgia identifies potential barriers to market integration and discusses recommendations on potential improvements. The report is based on the market monitoring indicators used by ACER for its related activity, adjusted to data availability and market development on wholesale electricity level and related to cross border issues in the analysed markets. It **assesses market performance in order to identify inefficiencies** and establishes sustainable indicators. The report covers **Albania, Bosnia and Herzegovina, FYR of Macedonia, Georgia[5], Kosovo*, Moldova, Montenegro, Serbia and Ukraine**.

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1 www.energy-community.org. The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, FYR of Macedonia, Kosovo*, Moldova, Montenegro, Serbia and Ukraine. Armenia, Georgia, 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 Opinion on the Kosovo declaration of*].

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.

5 Only in limited number of calculations.

4. Methodology

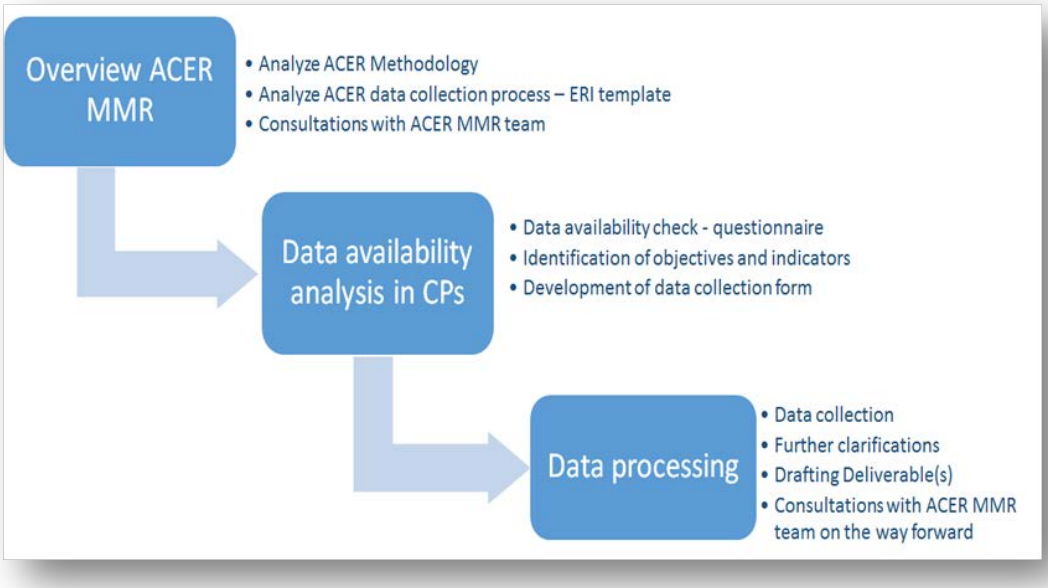
Data and analysis provided in this report is based on information provided by the regulatory authorities of the analyzed markets through specially designed data collection forms and data collected from ENTSO-E[6] and the SEE CAO[7] database about country profiles, cross-border capacity calculation and allocations volumes.

Table 1: Data sources

Type of source[8]	Source	Data items	Made available through	Format
98%	NRAs	• Detailed data on wholesale markets and Cross Border electricity trade through data collection forms • Contribution to data checks	Bilateral E-mail exchange	XLS
1%	ENTSO-E	• Generation, demand/load data • Limited contribution to data checks	Website	XLS
1%	SEE CAO	• Auction results • Limited contribution to data checks	Website	PDF/XLS

The process description of how this Wholesale Electricity Market Monitoring Report was developed is presented below.

[6] www.entsoe.eu.
[7] www.seecao.com.
[8] Percentage of data acquisition only represents rough indications of used data sources.



According to the abovementioned and 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 the benefits stemming from the use of the cross-border capacity. Chapter 2 describes the barriers to market integration and chapter 3 provides analysis on cross border trade and utilization of cross-border capacities. Chapter 4 concludes the report with the main observations for further analysis and action. The criteria used in the report were grouped into the corresponding three sections. Table 2 shows the sections and indices.

Table 2: List of indicators

Section	Indicators
Market integration	• Evolution of wholesale/balancing electricity prices • Wholesale/balancing electricity price differentials • Wholesale/balancing electricity price convergence
Market concentration	• Evolution of number of market participants • Electricity volume traded through bilateral contracts • Market share of largest generating company • Market share of largest provider of balancing energy and reserve capacity • Concentration measure – HHI • Electricity traded through bilateral contracts as a percentage of the amount of total consumption

Section	Indicators
Cross border trade (utilization of cross border capacity)	• Cross-border capacity allocation efficiency in different timeframes • Evolution of annual/quarterly level of commercial use of interconnectors (day-ahead and intraday) as a percentage of NTC values • Percentage of NTC used in the "right direction" • Percentage of months in an year with net DA nominations against price differential • Volumes of net D-1 commercial nominations against price differentials • Month ahead cross-border capacity allocation as a percentage of declared NTC • Level of intraday cross-border trade • Total amount of balancing energy and reserve capacity contracted abroad • Balancing energy activated abroad as a percentage of the amount of total balancing energy activated in national balancing markets • Congestion revenues • Amount of curtailed capacities and number of curtailment cases

FINDINGS

1. Market Integration

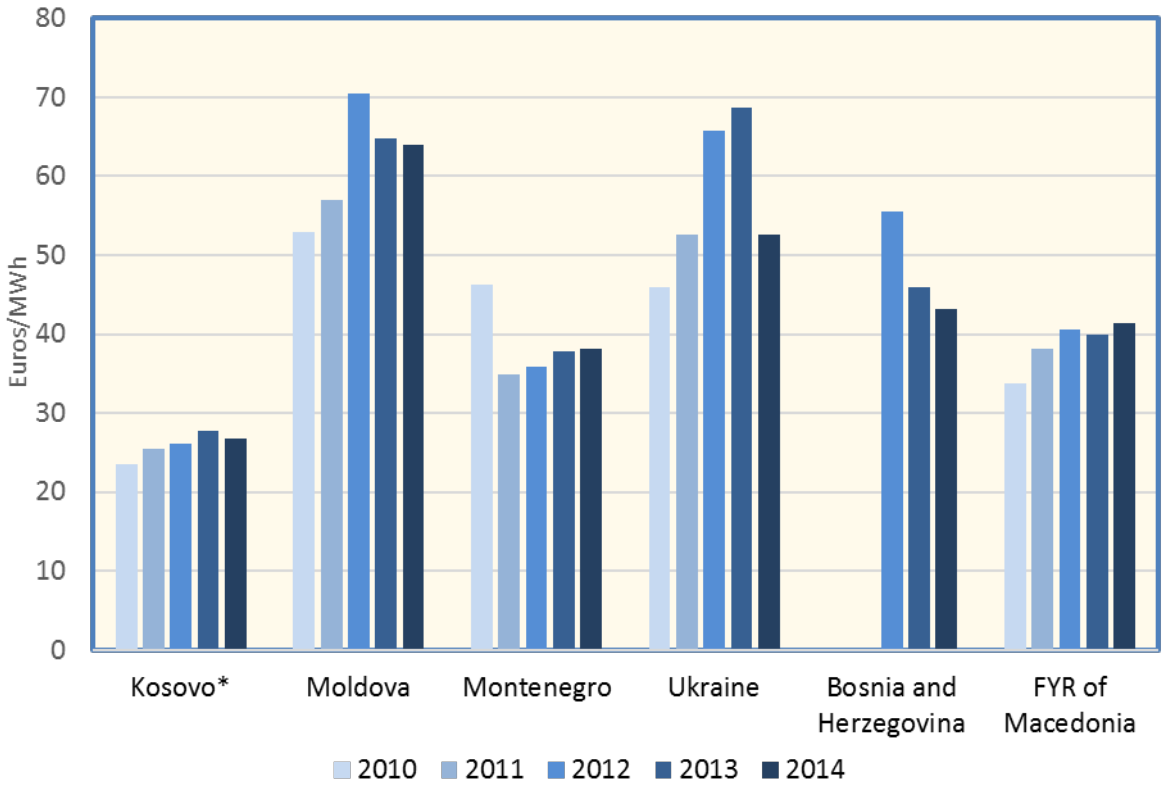
The section reports on key developments in electricity wholesale markets, including an assessment of the level of wholesale market integration and its benefits.

1.1. Price convergence

Figure 1 presents recent trends in wholesale electricity prices in the Contracting Parties. In 2012 a significant price hike in Ukraine and Moldova was observed[9]. However, in 2014, wholesale electricity prices decreased in Ukraine and Bosnia and Herzegovina while in other Contracting Parties, the price level has been contained at the same level. Prices difference between Ukraine / Moldova and other Contracting Parties are still significant.

[9] Wholesale price increase in Moldova was due to import price increase from Ukraine (Moldova being dependent on Ukraine imports). Explanations for the price hike in Ukraine were not provided.

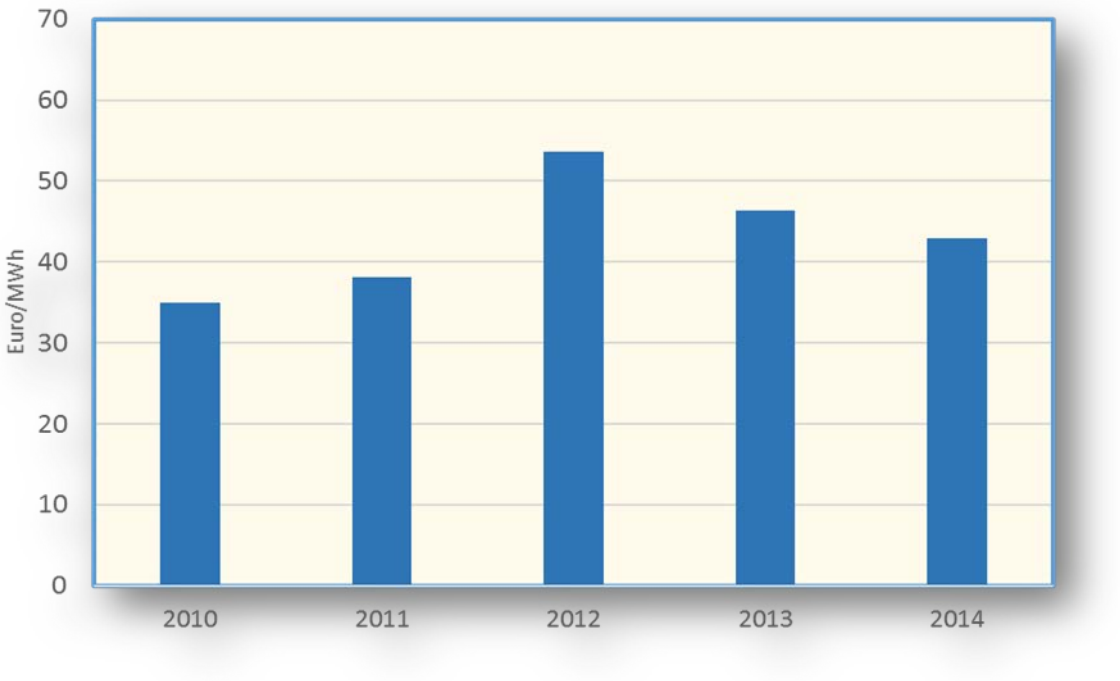
Figure 1: Evolution of wholesale electricity prices of Contracting Parties – 2010-2014 (Euros/MWh[10])



Wholesale price convergence and price differential can be considered as an indicator of market integration, even though an optimal level of market integration does not necessarily require full price convergence. The figures below provide an overview of the development of convergence of monthly average wholesale electricity prices in Contracting Parties over the last years[11]. According to Figure 2, the price differential increased in 2012 as prices had significantly increased in Ukraine and Moldova. Despite a general downward trend since 2012, price differentials still remain to be significant. According to the data analysed, the lowest wholesale prices are recorded in Kosovo and the highest in Moldova. Wholesale price convergence in recent years increased between Bosnia and Herzegovina, FYR Macedonia and Montenegro in 2014. In trying to explain the persistence of only limited price convergence, another important element is the very comprehensive level of price regulation and cross-subsidisation within Contracting Parties as well as the lack of a reference price for electricity in the Region, which hinder the competitive formation of wholesale prices.

[10] Mega Watt Hour.
[11] Price differentials are calculated as the difference between the maximum and minimum wholesale prices of the assessed Contracting Parties during a specific month within a year. Only a month with maximum differential is selected.

Figure 2: Wholesale electricity price differential in Contracting Parties 2010-2014 (Euros/MWh)



Figures 3 and 4 show the correlation between available export capacities from Bosnia and Herzegovina to Montenegro and from Ukraine to Moldova and the level of monthly price convergence in the respective Contracting Parties. Highlighted areas show interesting example of correlation between the indicators. As commercial nominations decrease wholesale price differential increases. This example shows the impact of market integration on price convergence.

Figure 3: Price convergence between Bosnia and Herzegovina and Montenegro compared to D-1 commercial nominations from Bosnia and Herzegovina to Montenegro – 2013-2014 (MWh and Euro/MWh)

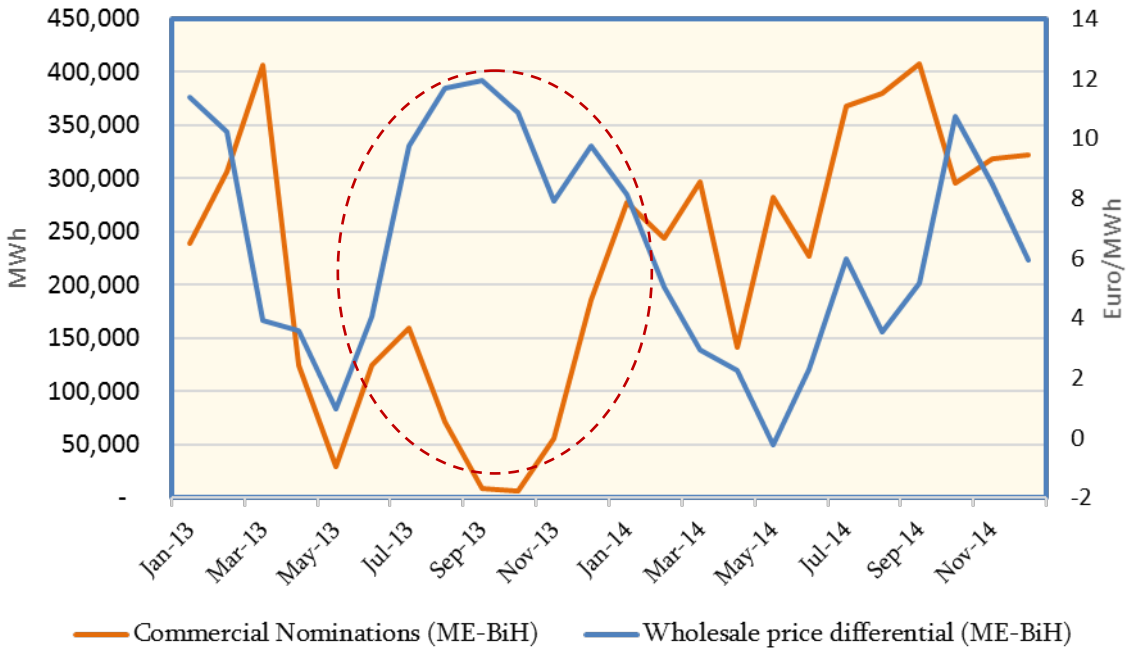
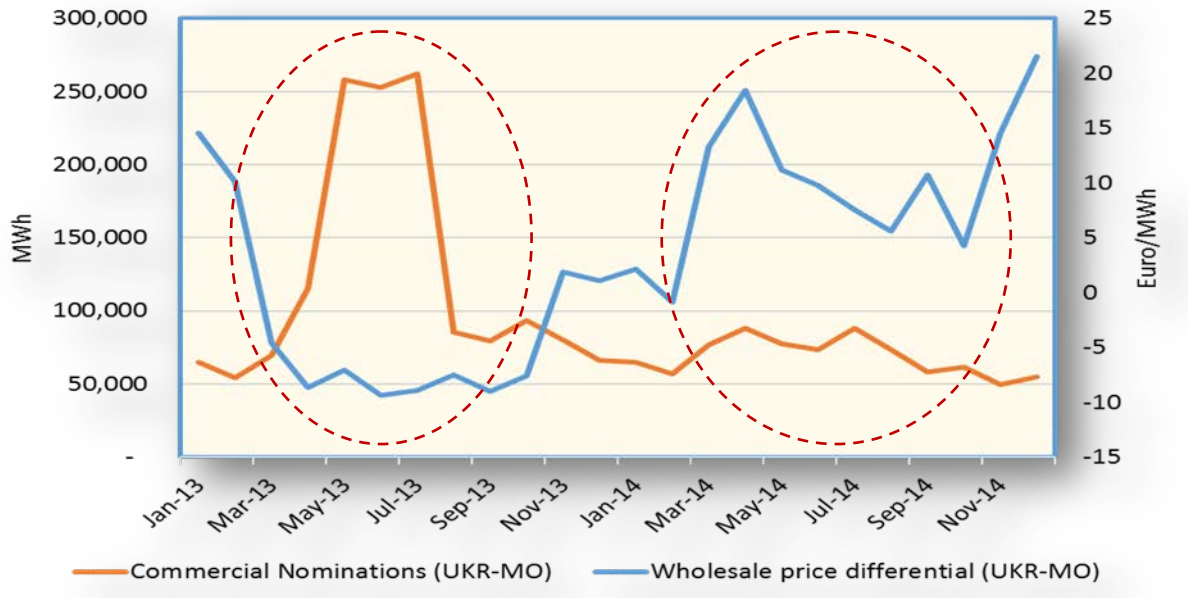


Figure 4: Price convergence between Ukraine and Moldova compared to D-1 commercial nominations from Ukraine to Moldova – 2013-2014 (MWh and Euro/MWh)



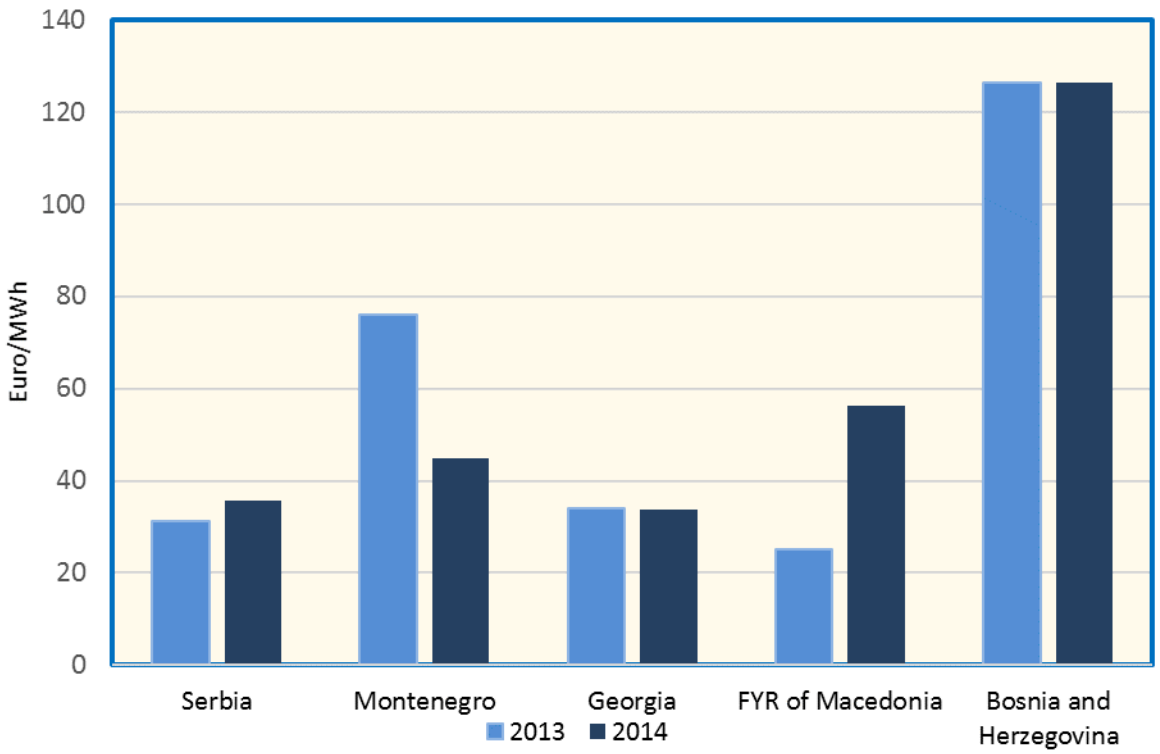
In this context, it is worth mentioning the unique situation in Moldavian electricity market, with few participants and limited electricity supply options making price convergence more sensitive to interconnector capacity utilization.

1.2. Balancing

Electricity system balancing includes all the actions and processes performed by a Transmission System Operator (TSO) in order to ensure that the total electricity withdrawals[12] () equal the total injections in a control area at any given moment. Among other elements, adequate imbalance settlement and cross-border balancing exchanges are the 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 integration in the Contracting Parties and Georgia.

Balancing electricity price levels and their convergence can be treated as an indicator of regional balancing cooperation. Figure 5 provides an overview of the development of balancing energy prices within contracting and observer parties over the last years.

Figure 5: Evolution of balancing electricity prices in Contracting Parties – 2013-2014 (Euros/MWh)



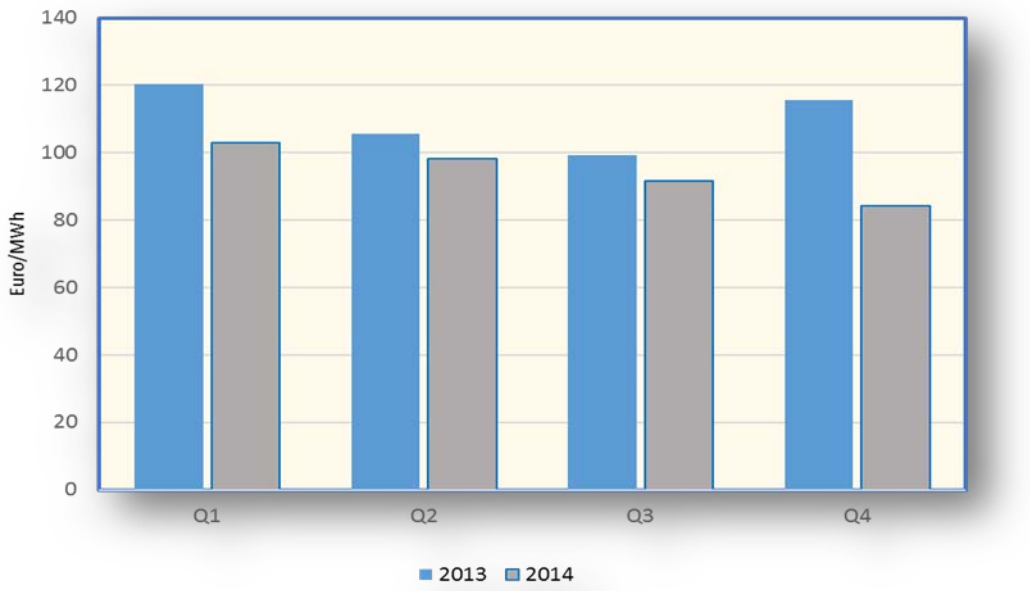
The balancing energy price increase in FYR Macedonia coincided with the increase of average prices paid for contracted balancing reserve capacity. The regulatory authority of FYR of Macedonia in yearly price decisions approves prices for balancing capacity provided by the national generation company, ELEM[13] that is obliged to meet public services obligation and also include system services

[12] Including losses; losses are normally not part of balancing, but balanced out before balancing timeframe.
[13] www.elem.com.mk.

for the TSO. The main reason for the increase of balancing energy/capacity prices were an increase of fixed costs of ELEM for system services in recent years.

Figure 6 shows the quarterly average price differences between highest and lowest balancing prices in the Contracting Parties. Big differences indicate low balancing market cooperation between countries. Substantial price differences are caused by high balancing energy prices in Bosnia and Herzegovina[14].

Figure 6: Balancing electricity price differential in Contracting Parties 2013-2014 (Euros/MWh)



One of the main explanations for the price differentials is also that there is no separate procurement of balancing reserves and energy in most countries (in Bosnia and Herzegovina there is), so that the supposedly low balancing energy prices most probably result from either cross-subsidizing of the energy through the reserve payment or price regulation. Only the separate procurement of both elements in a competitive market can lead to competitive prices for both services.

[14] Data about the market share of the largest provider of balancing energy is not available for Bosnia and Herzegovina; therefore, no in-depth analysis on the correlation between high balancing prices and market concentration could be performed for the purpose of the present report. It is worth mentioning that Bosnia and Herzegovina does not carry out balancing energy/capacity contracting abroad.

2. Market Concentration

Gross electricity consumption in the Energy Community Contracting Parties decreased on average from 2011 to 2014 by almost 6%. The electricity consumption substantially decreased in all parties, except Moldova. Reasons for such decrease may differ among countries, [15]also following the general trend on EU level. The figures below present aggregate consumption and load characteristics together with the evolution of market participants in the EnC Contracting Parties.

Figure 7: Load and consumption characteristics in Contracting Parties[16] – 2010-2014 (MW and MWh)

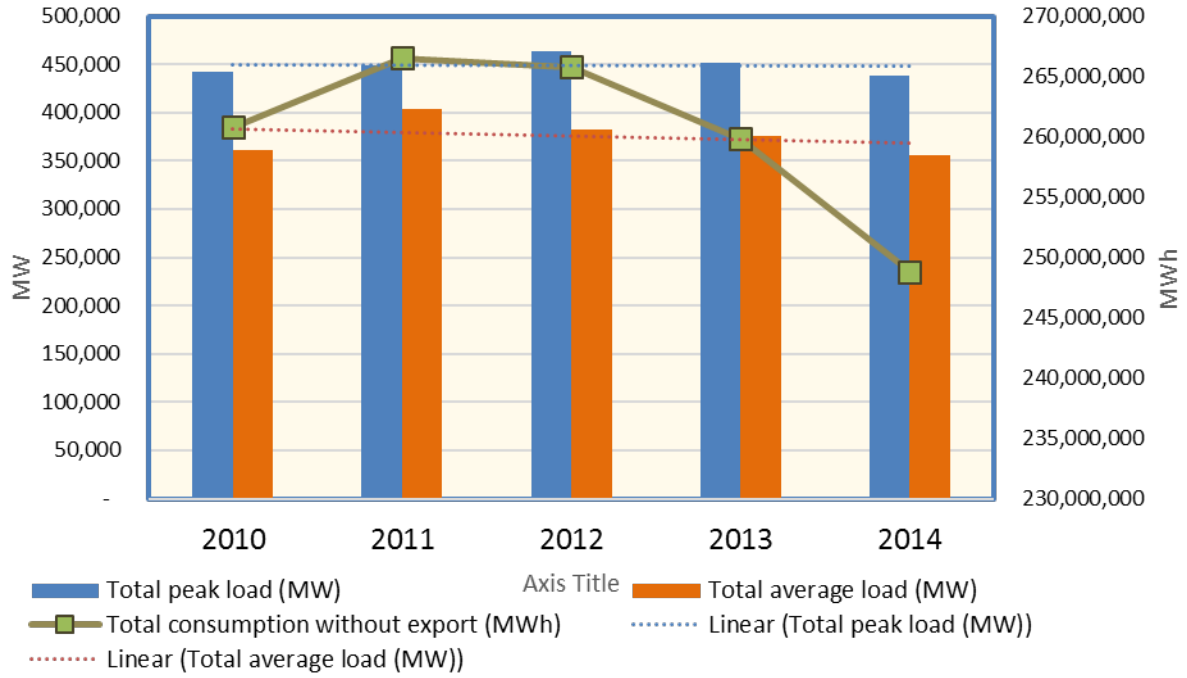
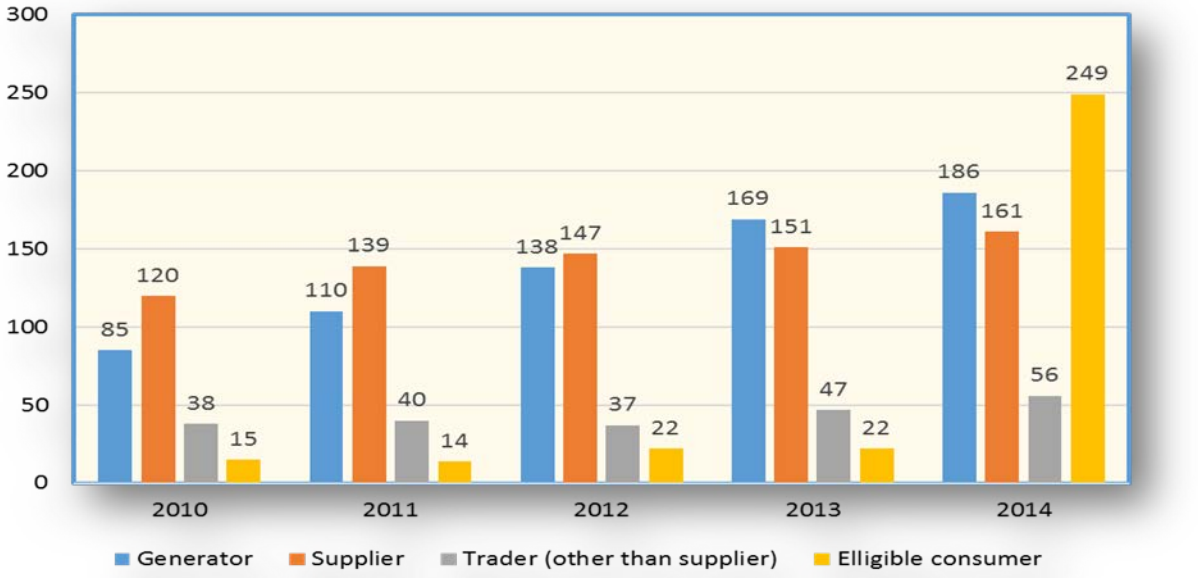


Figure 8 describes the number of market participants as a sum of data provided by Contracting Parties[17]. As it is seen, there is constant increase of market participants in all parties. In 2014, a rapid increase of eligible consumers was caused by partial market opening in FYR of Macedonia and a constant increase of eligible market participants in Ukraine.

[15] Detailed related analysis for the individual assessed markets was not performed for the purpose of this report.
[16] Albania, Bosnia and Herzegovina, FYR Macedonia, Kosovo*, Moldova, Montenegro, Serbia and Ukraine.
[17] Data for Serbia not included.

Figure 8: Evolution in numbers of market participants in Contracting Parties[18] – 2010-2014



The table below shows the evolution of market participants on country level.

Table 3: Market participants in Contracting Parties and Georgia

		2010	2011	2012	2013	2014
Albania	Generator	0	1	2	6	7
	Supplier	1	9	10	15	14
	Trader (other than supplier)	1	9	10	17	20
	Eligible consumer	0	1	8	8	9
Bosnia and Herzegovina	Generator	3	3	3	3	3
	Supplier	3	3	3	3	3
	Trader (other than supplier)	10	10	11	15	15
	Eligible consumer	2	0	1	1	2
Georgia	Generator	56	56	57	61	67
	Supplier	3	3	3	3	3
	Trader (other than supplier)[19]	NAP[20]	NAP	NAP	NAP	NAP
	Eligible consumer	10	9	7	7	8
Kosovo*	Generator (>1MW)	5	5	5	6	6
	Supplier	1	1	1	1	1
	Trader (other than supplier)	18	14	12	7	4
	Eligible consumer	-	-	-	-	-

[18] Albania, Bosnia and Herzegovina, FYR Macedonia, Kosovo*, Montenegro, Montenegro, Serbia and Ukraine.

[19] In Georgia distribution licensees (exists 3 distribution licensees) are the only supplier within their area. According to the secondary legislation small power plants are also authorized to supply electricity to retail consumers but in practice it doesn't work.

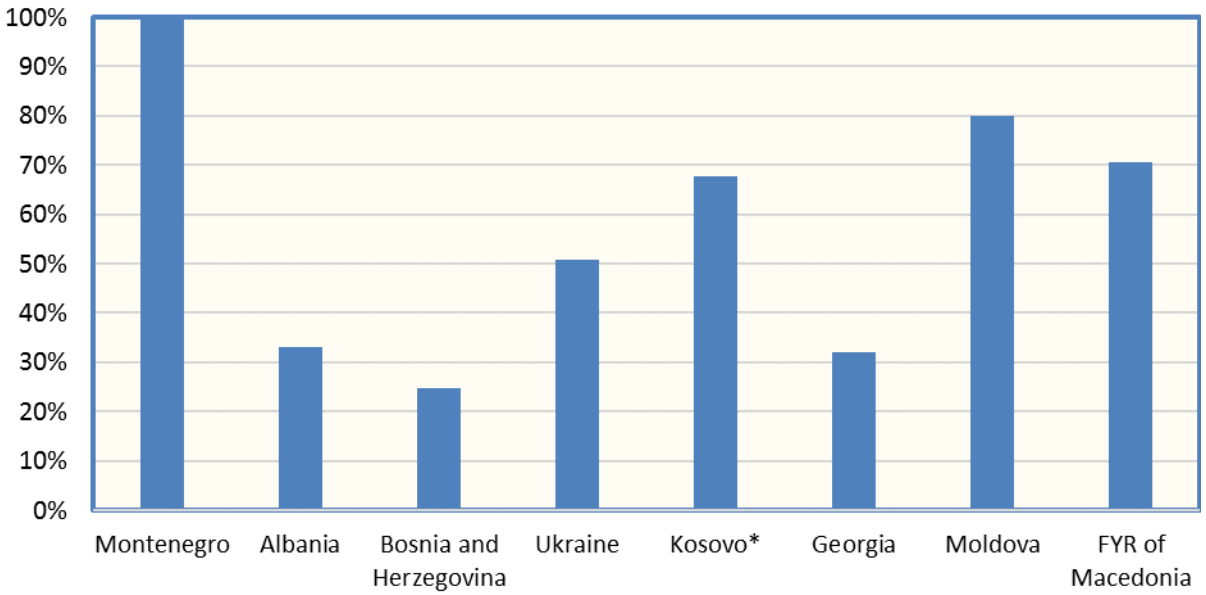
[20] Not applicable

		2010	2011	2012	2013	2014
FYR of Macedonia[21]	Generator	1	1	3	3	3
	Supplier	2	2	2	2	7
	Trader (other than supplier)	9	7	4	8	17
	Eligible consumer	9	9	9	9	234
Moldova	Generator	4	4	4	4	4
	Supplier[22]	1	1	1	1	1
	Trader (other than supplier)	N/A	N/A	N/A	N/A	N/A
	Eligible consumer	4	4	4	4	4
Montenegro	Generator	1	1	1	1	2
	Supplier	2	2	2	2	2
	Trader (other than supplier)	0	0	0	0	0
	Eligible consumer	0	0	0	0	0
Ukraine	Generator	71	95	120	146	161
	Supplier	110	121	128	127	133
	Trader (other than supplier)	NAP	NAP	NAP	NAP	NAP
	Eligible consumer	N/A	N/A	N/A	N/A	N/A

Figures 9 and 10 characterize the levels of electricity production/reserve capacity market concentration in Contracting Parties. It is important to check for the market share of the largest players in the industry. Although there is common academic standard on which percentage of a market share indicates concentrated industry, but according to general observation values higher than 20% may already be a concern for the competition level. A value of > 40% may suggest a dominant position on the market. A value of > 50% is interpreted as an indication of a dominant position on market.23 The market share of largest generating company varies among the Contracting Parties, while the reserve capacity market is dominated by one balancing energy/capacity provider. According to the results, electricity markets in Montenegro, Kosovo*, Moldova and FYR Macedonia are dominated by one large generating company24. As regards to balancing energy and reserve capacity for all types of reserve, mostly only one provider in the market was reported by parties.

[21] Only shows active market participants in FYR of Macedonia
[22] Holder of license for electricity supply other than non-regulated tariffs
[23] Introduction to electricity markets, textbook developed by ERRA, 2008.
[24] Annual production of the largest generator is compared to the gross production (import is not taken into account).

Figure 9: Market share of largest generating company in Contracting Parties and Georgia – 2014 (%)[25]



Market concentration is one of the elements for assessing the performance of wholesale markets. The Herfindahl-Hirschman (HHI) index is more responsive to outstanding values than the simple market share figure above and its value ranges between 0 and 10,000. The usual trigger levels for the index are as follows: HHI≤1000 – not concentrated; 1000<HHI≤1800 - moderately concentrated; 1800<HHI – concentrated[26]. HHI is calculated as sum of squared market shares (in %) of all generating companies supplying a market for both – energy and capacity. The results shown in the following figure correlate with Figure 9. The figure below summarized HHI levels for Energy Community Contracting Parties and Georgia.

[25] Data for Serbia not available.
[26] Introduction to electricity markets, textbook developed by ERRA, 2008.

Figure 10: Herfindahl-Hirschman Index - 2014

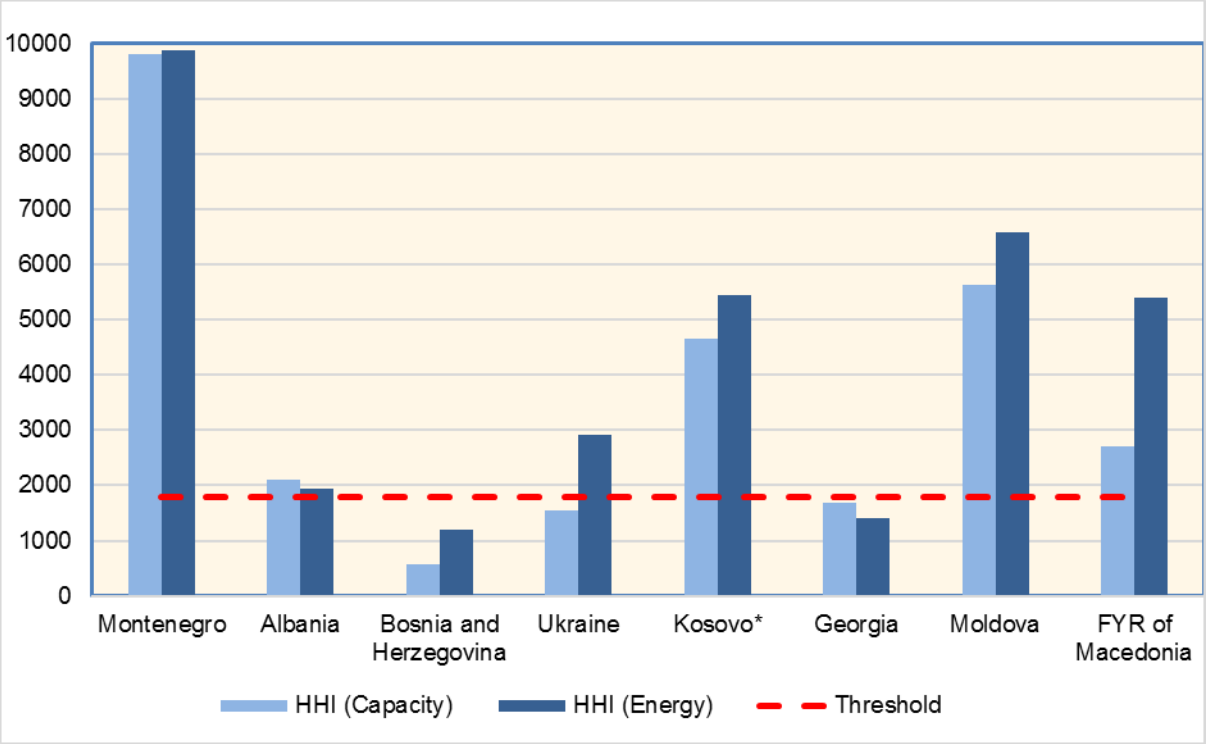
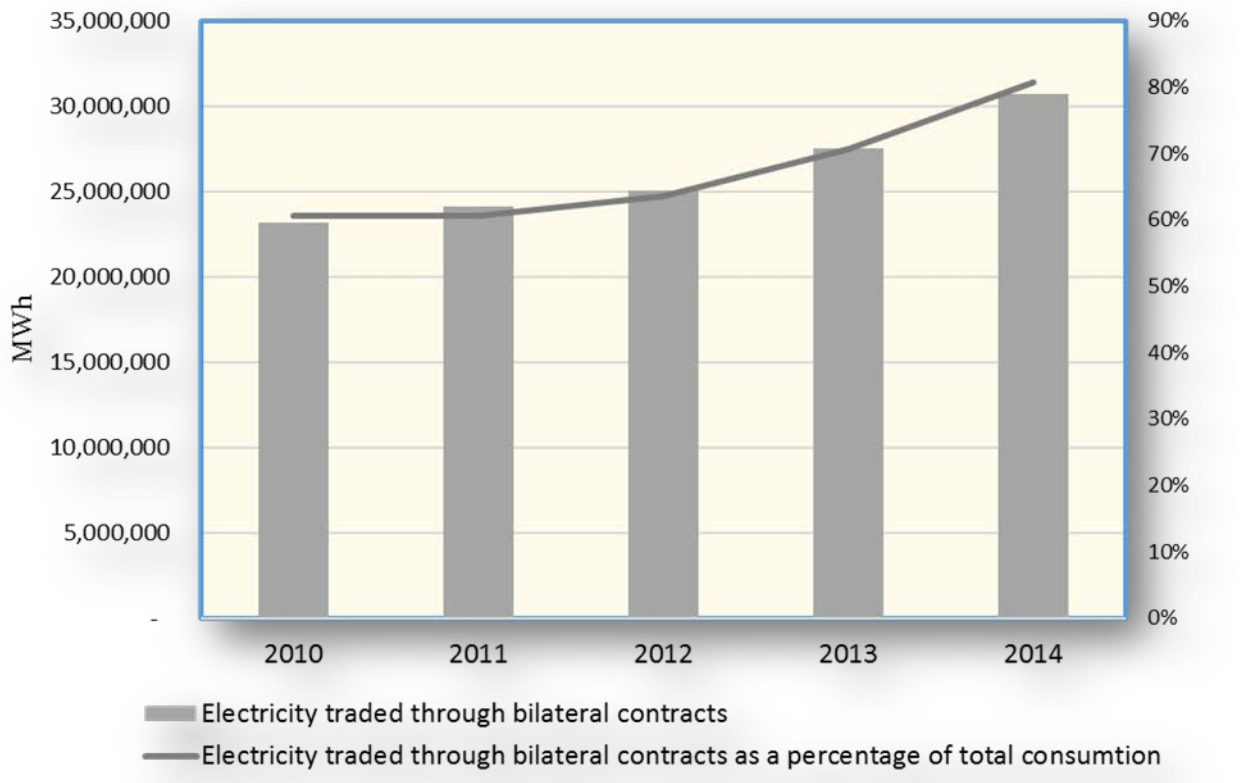


Figure 11 characterizes bilateral trading volumes in Contracting Parties and their share in overall transactions at the market. According to the data, traded volume through bilateral contracts increases over the period27. Traded energy volumes through bilateral contracts have sharply increased in Albania in 2014 year and constituted 87% of wholesale trade. In Kosovo*, FYR Macedonia and Moldova almost 100% of electricity trade is based on bilateral contracts.

27 Data from Serbia and Ukraine is not included.

Figure 11: Electricity traded through bilateral contracts as a percentage of the amount of total consumption in Contracting Parties 2010-2014 (MWh, %)



3. Cross border trade - utilization of cross border capacity

In order to achieve an efficient exchange of cross-border and balancing services, common standard products must be defined by TSOs and an adequate level of harmonization of core aspects of cross border capacities and balancing mechanisms should be defined. This would allow those products to achieve sufficient liquidity and adequate competition in the markets where they are traded. Coordinated allocation of cross-border capacities is one of the cornerstones for starting to harmonise market participation requirements in order to integrate national markets while aiming to reduce transaction costs, increase competition and transparency. It is important to analyze to which extent Contracting Parties 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 Table 4 Contracting Parties' cross-border capacity calculation methods and timeframe are summarized.

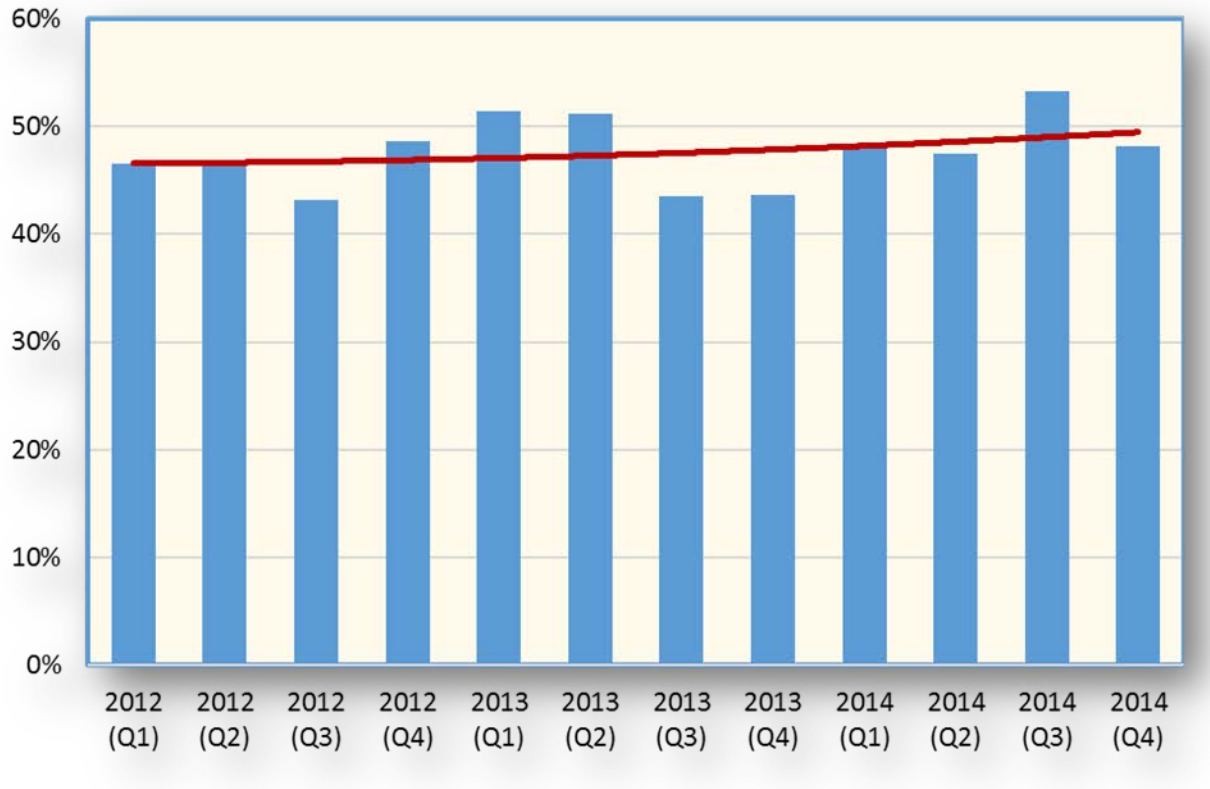
Table 4: Cross-border capacity calculation methods

Contracting party	Frequency of capacity calculation	Capacity calculation methods	Limitation of cross-border capacity	TTC with neighbouring CPs (MW)
Bosnia and Herzegovina	Month ahead	Fully coordinated NTC[28]	No	4400
Montenegro	Year ahead, Month ahead and day ahead	Fully coordinated NTC	No	4810
Serbia	Year ahead Month ahead	Fully coordinated NTC	monthly NTC is calculated in order to solve congestion inside TSO control area	4822/5401[29]
Ukraine	Capacity is calculated for year ahead (month ahead and day-ahead in case of unscheduled change of network)	Pure bilateral NTC	No	-
FYR Macedonia	year ahead, month ahead, week ahead, day-ahead	Fully coordinated NTC	-	5425

The following figures provide an update on the use of existing cross-border transmission capacity throughout Contracting Parties for several timeframes. It presents the level of commercial use of interconnections. Figure 12 shows the evolution of the commercial use of the cross-border capacities in Contracting Parties at the day-ahead timeframe (for both directions on each border) over the last 12 quarters[30]. According to this figure, use of cross border capacity has increased slightly. The increased use of the interconnectors could be due to a combination of reasons but it doesn't necessarily imply an increase in the efficient cross-border capacity utilization as it includes cross-border power flows against price differentials as well. Nevertheless, it highlight the increasing importance of closer to real-time trade in the Contracting Parties, a trend that was also observed in the Energy Community's more developed electricity markets.

[28] Net Transfer Capacity, ie transmission capacity for import and export across borders which can be safely made available.
[29] Two values refer to summer/winter limits.
[30] The percentages of use of the interconnections are calculated for every border and direction as follows: all the hourly D-1 net nominations (which usually include the sum of nominations coming from day-ahead trade and long-term trade) are added and divided by the total amount of capacity offered to the market (NTC). The results are shown in aggregated form for all borders. The used methodology differs from the one used by ACER in its Market Monitoring Reports to the extent that ACER computes both directions of an interconnector, so in practice the maximum possible use would be only around 50%. According to the method used in the present report, calculation of capacity usage based on one average NTC was adopted due to lack of data for CPs compared to data availability for ACER´s methodology. For the methodology used in the present 100% use of the capacity would be possible as calculation assumption

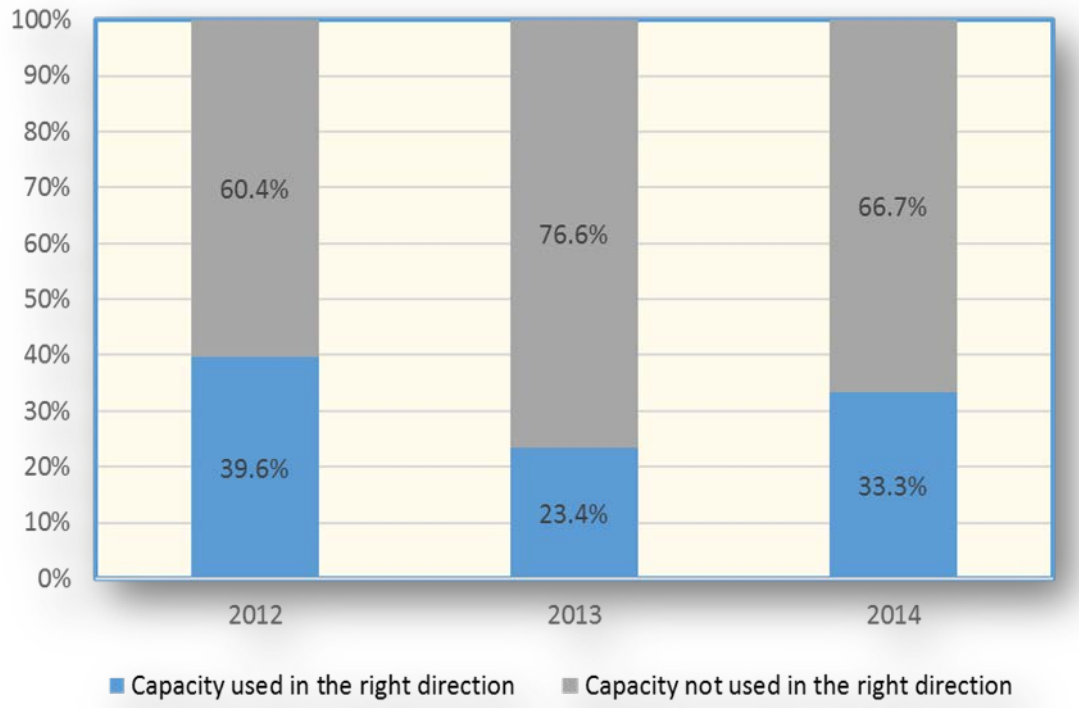
Figure 12: Evolution of the quarterly level of commercial use of interconnections (day-ahead) as a percentage of NTC values – 2012-2014 (%)[31]



Single price coupling eliminates "wrong way"[32] flows and hence improves the use of cross-border capacities for trade. In EnC Contracting Parties market coupling has not been implemented yet, hence when prices diverge across a border, the full utilization of the cross-border capacity in the "right direction" is essential for achieving efficient use of an interconnection. The graph below shows a slightly declining trend of this indicator over the recent years for the selected parties.

[31] Data from Albania, Kosovo*, FYR Macedonia and Moldova is not included.
[32] A "wrong-way flow" means the case where the final net nomination on a given border takes place from the higher to the lower price zone.

Figure 13: Percentage of NTC used in the “right direction” in the presence of significant price differentials - Bosnia and Herzegovina, Moldova, Montenegro and Ukraine borders – 2012-2014 (%)



Figures 14 and 15 show the evolution of “wrong way” flows across the selected Contracting Parties’ borders that are used to describe utilization efficiency of cross-border transfer capacities. Despite the fact that this tendency has decreased significantly over years, it is still present at the Ukraine-Moldova border. “Wrong flows” on the Ukraine-Moldova border are due to the dependence of the Moldavian power system on electricity imports and partially also by the absence of harmonized cross-border capacity allocation instruments.

Figure 14: Percentage of months in a year with net day-ahead nominations against price differentials per border – 2012-2014 (%)

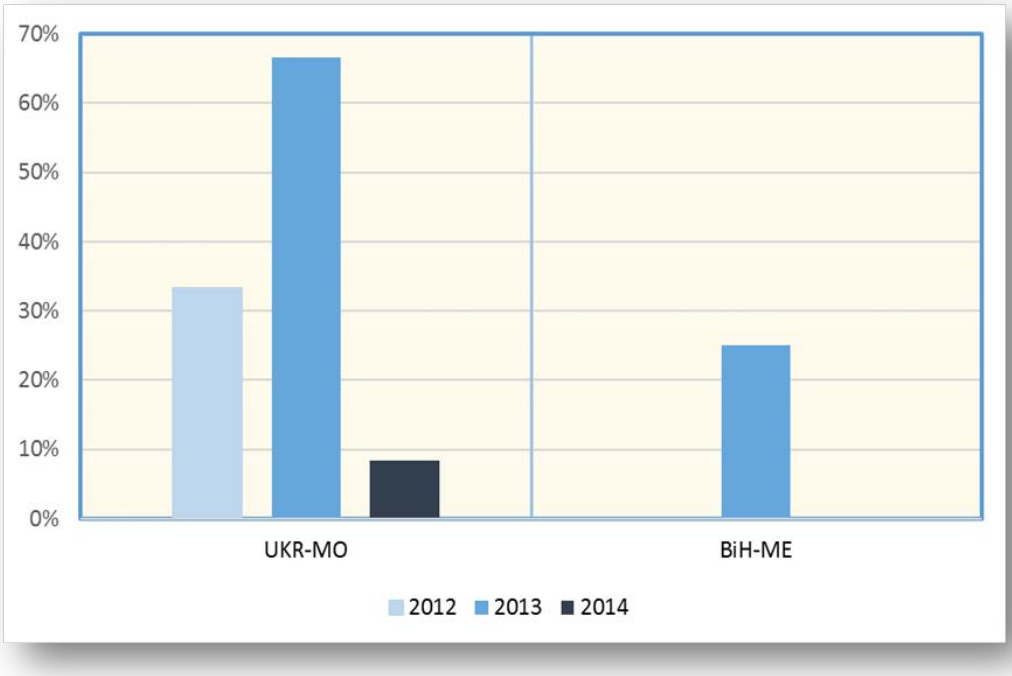
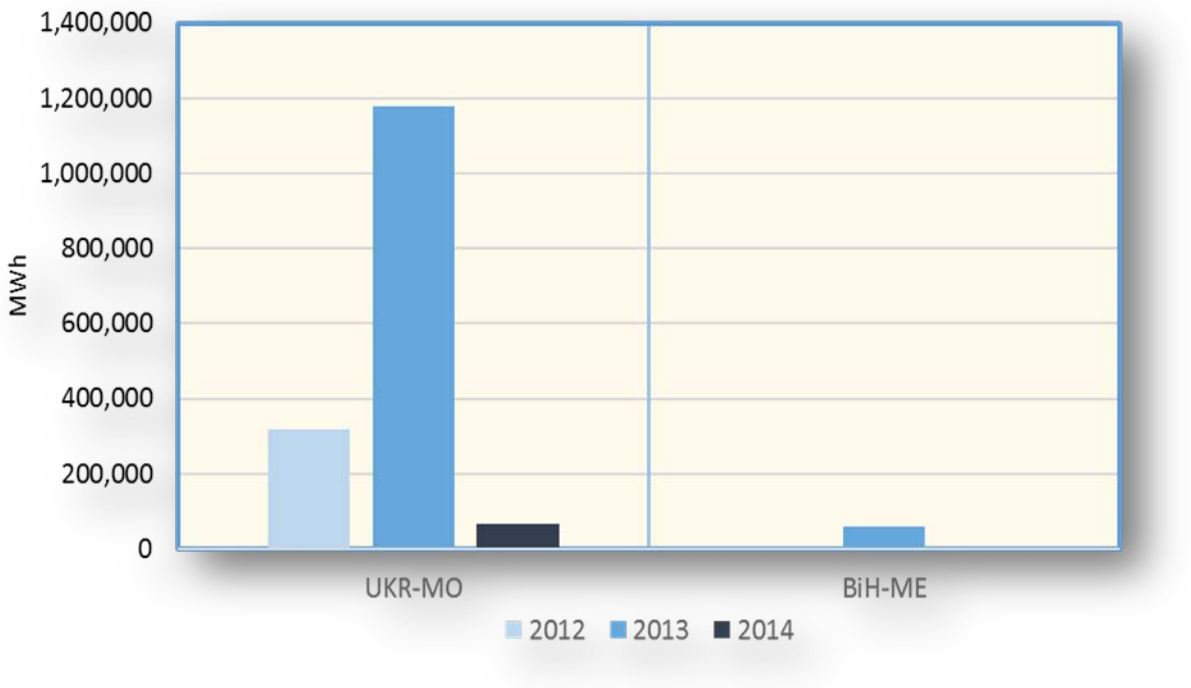
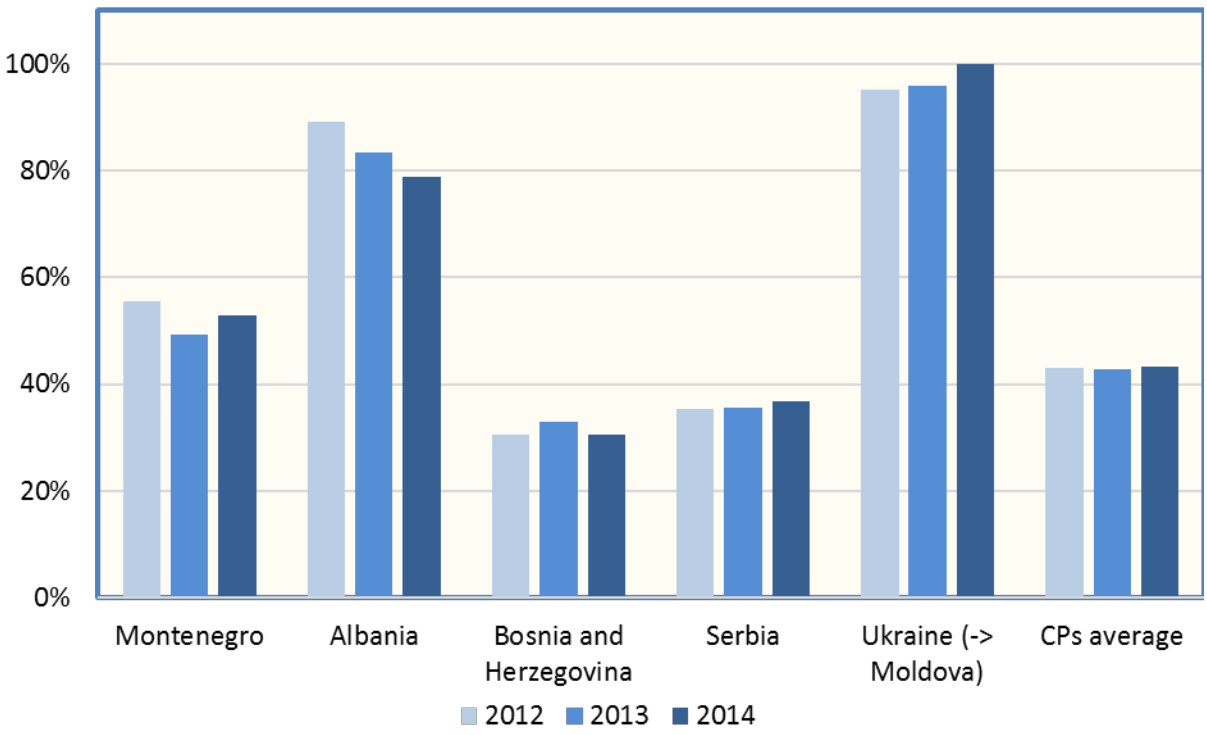


Figure 15: Volumes of net D-1 commercial nominations against price differentials per border – 2012-2014 (MWh)



Cross-border capacities are offered to the market and traded in different timeframes. After the forward and day-ahead timeframes, remaining capacities are offered for trade during the intraday timeframe and for exchanges in the balancing timeframe. This section presents a review of the use of capacities in these timeframes in order to identify remaining barriers for further integration of the national electricity markets. First, it evaluates the impact of different capacity allocation methods on cross-border trade. Secondly, it assesses the potential use of the remaining cross-border capacity after the day-ahead timeframe to increase intraday cross-border trade. Figure 16 shows the level of cross-border NTC allocation at a month ahead timeframe in CPs over the recent years. According to the data provided, cross border transfer capacity allocation from Ukraine to Moldova reached almost 100%, highlighting the need for further analysis under the light of at the same time reportedly decreased electricity imports in Moldova from Ukraine since 2014.

Figure 16: Month-ahead cross-border capacity allocation as a percentage of declared NTC – 2012-2014



The level of liquidity in intraday trade is a key element in achieving well-functioning intraday markets and efficient cross-border intraday trading. Figures 17 and 18 show the day-ahead and intraday cross border trade level for Serbia and Bosnia and Herzegovina. 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 17: Level of intraday cross-border trade: absolute sum of net intraday nominations for a selection of Contracting Parties– 2012-2014 (MWh)

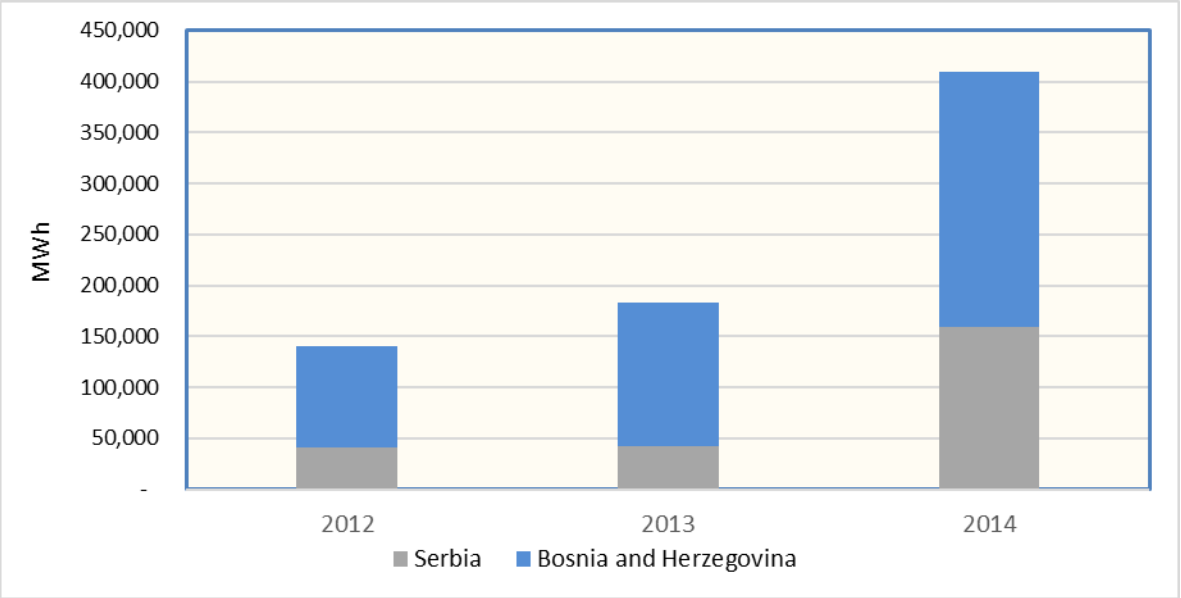


Figure 18: Level of day ahead cross-border trade: absolute sum of net day-ahead nominations for a selection of Contracting Parties– 2012-2014 (MWh)

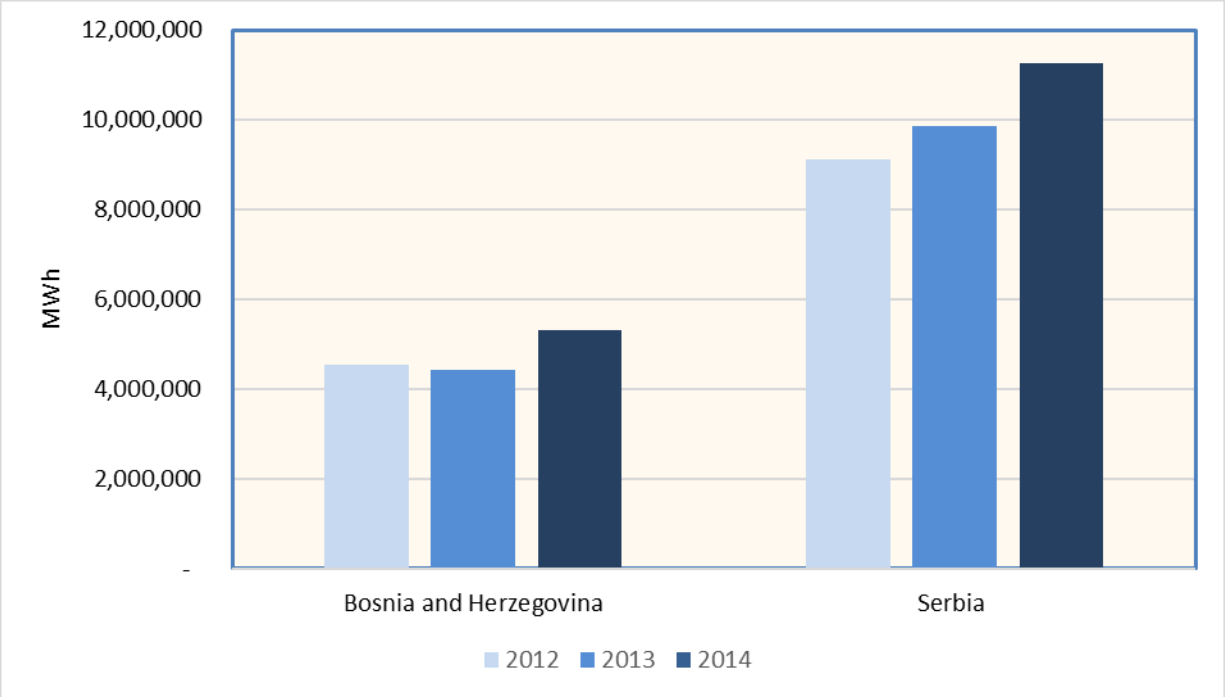
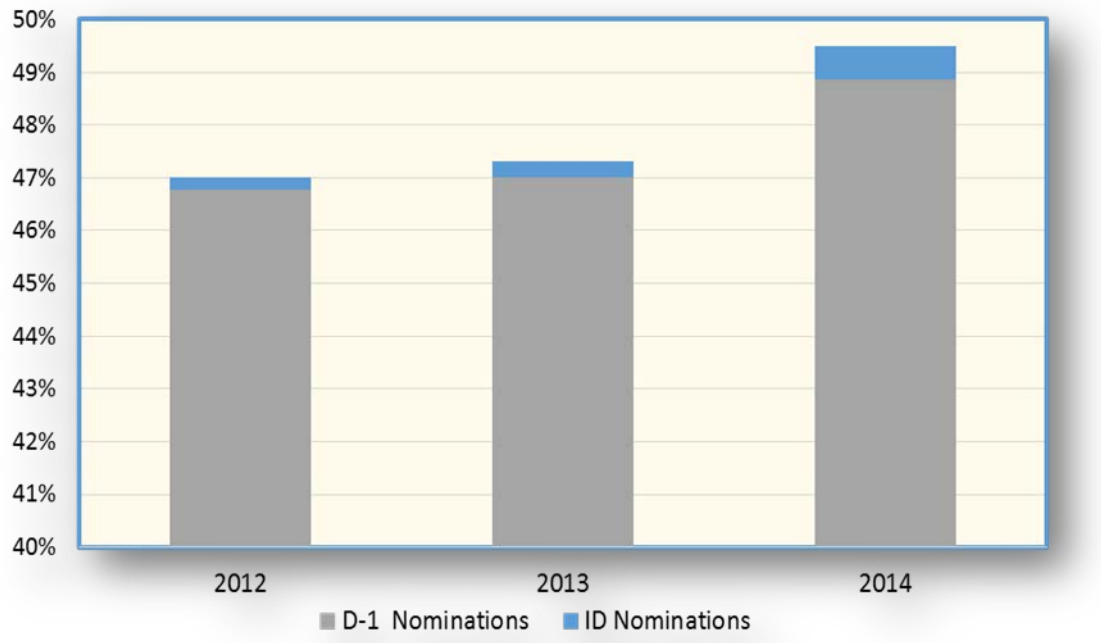


Figure 19: Evolution of annual level (average values) of commercial use of interconnections (day-ahead and intraday) as a percentage of NTC values for Contracting Parties'[33] borders – 2012-2014 (%)



The figures below show information about balancing energy contracted abroad and the percentage of balancing energy activated abroad compared to total balancing energy activated at national balancing markets. This is illustrating that the exchange of balancing services across the analysed CP's borders are currently limited. Data regarding such service sharing across border are not available for parties other than Serbia, FYR of Macedonia and Montenegro[34].

[33] Ukraine, Montenegro, Bosnia and Herzegovina and Serbia.
[34] The data used to calculate the percentages presented in this figure refer to balancing energy activated from all types of reserves.

Figure 20: Total amount of balancing energy contracted abroad by Serbia, FYR Macedonia and Montenegro – 2010-2014 (MWh)

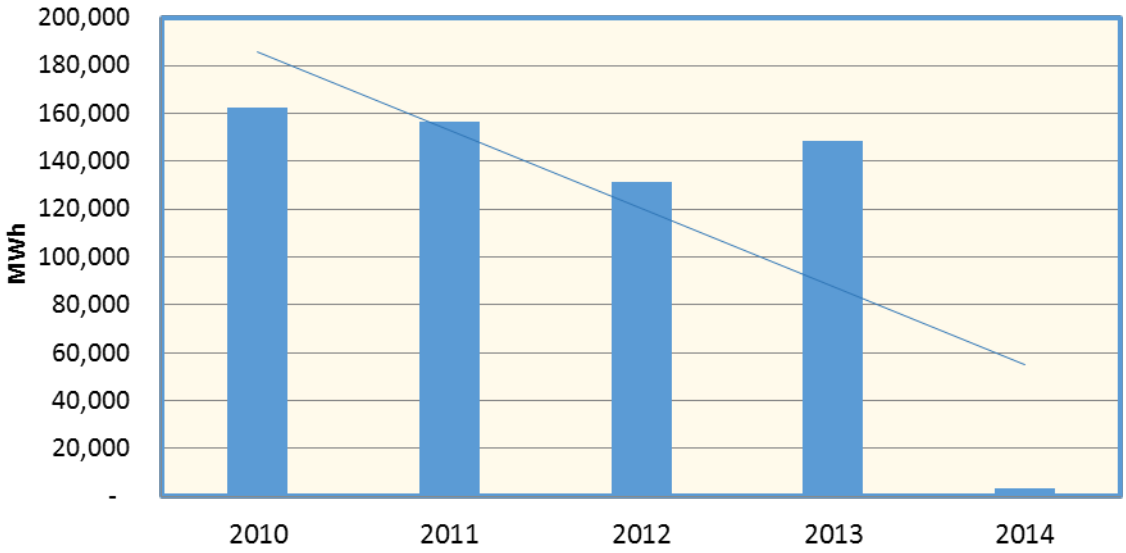
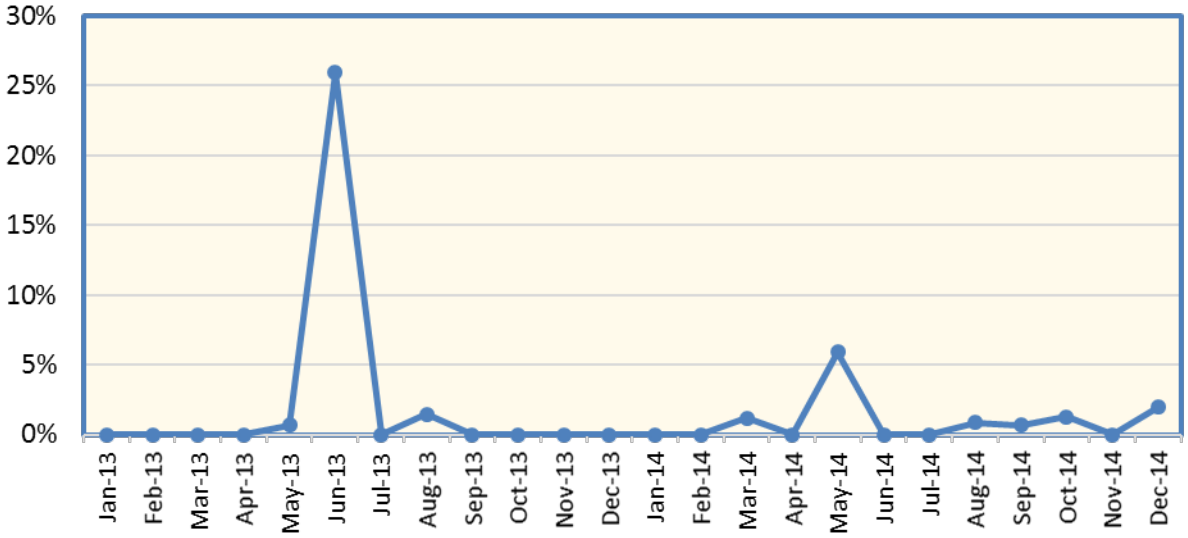


Figure 21: Balancing energy activated abroad as a percentage of the amount of total balancing energy activated in national balancing markets of Serbia and Montenegro 2013-2014 (%)



The following figures show curtailed capacities, the number of curtailment cases and congestion revenues. Capacity curtailment, if implemented by a TSO, is followed by compensation payments paid to the holders of cross-border transmission rights. However, despite existing curtailment cases in

CPs, compensation information is not available. According to the data reports from CPs, all congestion revenue was taken into account as income by the NRAs when calculating network tariffs.

Figure 22: Congestion revenues (Euros) – 2012-2014

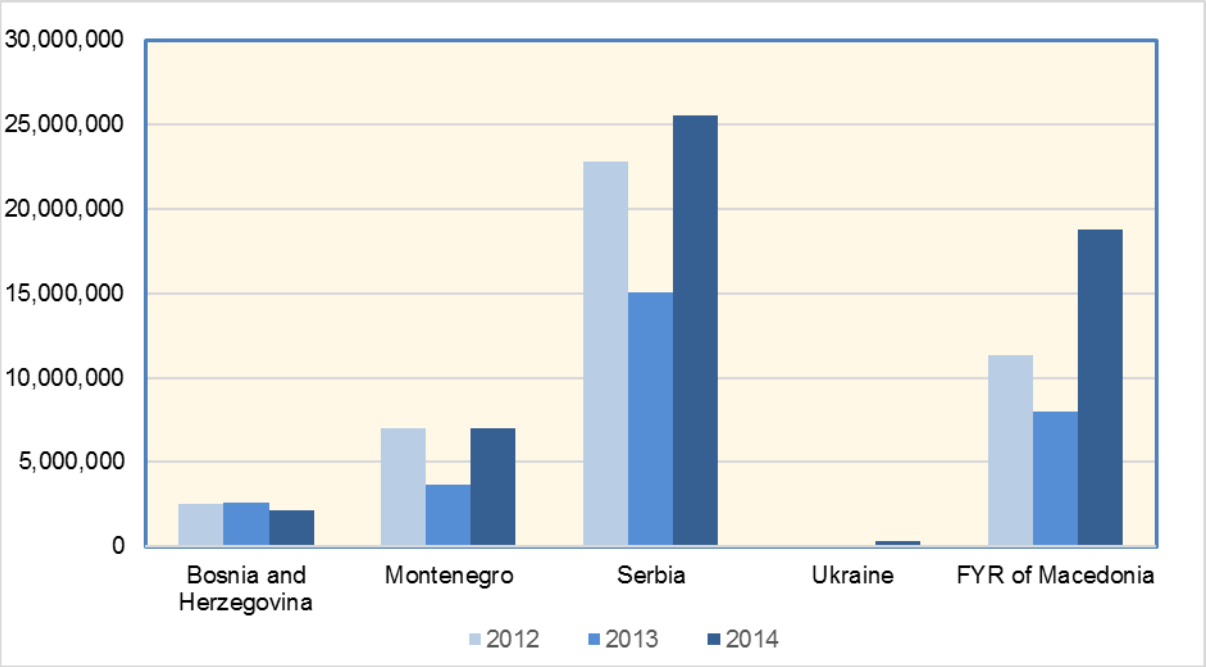
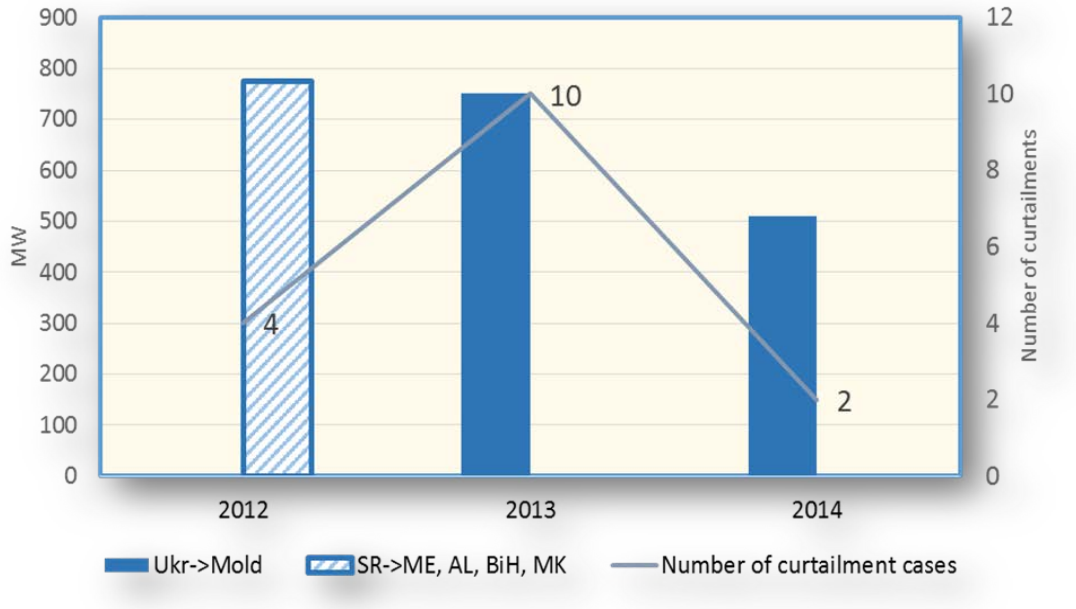


Figure 23: Curtailed capacities and number of curtailment cases per year - 2012-2014



SUMMARY OF FINDINGS

Demand and price trends

Against the background of declining electricity demand during the years 2010-2014, 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. Despite those trends, due to the lack of successful market integration steps, the report shows **large discrepancies in the electricity prices in the wholesale and balancing markets**.

Cross-border capacity calculations

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, on most of the assessed borders, the total transfer capacities are more than twice and more as high as the tradable capacity. The report concludes that the lack of coordinated and efficient capacity calculation methods in the analyzed period was one of the main shortcomings in achieving the efficient use of the network infrastructure in general. Increasing the coordination of capacity allocation in the following year should result in better use of cross-border capacity.

Day-ahead cross-border trade

Monitoring of day-ahead cross-border nominations shows a slight efficiency increase in the use of electricity interconnections from around 46.8% in 2012 to 48.9% in 2014. The report shows that a **significant amount of cross-border capacity remains underutilized** (in more than 60% of cases, capacity remains unused in the economic direction).

Intraday cross-border trade

The report shows that the **level of intraday trade remains modest**, on average less than 1% of total traded amount. The establishment of the SEE CAO and the implementation of intraday allocation rules including gate closure times, introducing of balancing responsibility for renewable generation and continuous and coordinated recalculation of cross-border capacities by TSOs in the intraday timeframe will contribute to improving liquidity and the efficient use of intraday cross-border capacity.

Balancing markets

The report shows that **further benefits could be obtained through increasing the cross-border exchanges of balancing energy** (including imbalance netting). The implementation of the principles of the CACM Regulation (EU) 1222/2015[35] and Network Code on Electricity

[35] Commission Regulation (EU) 1222/2015 establishing a guideline on capacity allocation and congestion management, OJ L 197 of 25.7.2015, p24 et seq.

Balancing, once approved, should contribute to balancing the systems more efficiently and the integration of balancing markets in the Contracting Parties. The report shows large disparities in the prices of balancing services and in the average costs – including energy and capacity components. Factors that explain these disparities include the underlying costs of the available resources for providing flexibility and the level of competition in balancing markets that are often national in scope.

CONCLUSIONS

The assessment of the level of market integration and of the efficiency in the use of interconnectors contained in this report shows that despite some progress in recent years, **important barriers to market integration still remain for several key reasons**. First, this is due to inefficiencies in the use of existing transmission networks stemming from inefficiencies in cross-border capacity calculation/allocation mechanisms and timeframes, and because of the lack of necessary measures to support the development of cross-border trade between areas characterized by differing demand-supply balances. Still, there are significant **potentials to further improve** the use of existing infrastructure and the efficiency of trading, in particular in the intraday and balancing timeframes.

The starting points for the better use of existing transmission networks are efficient cross-border capacity calculations and the appropriate mechanisms for allocation. The SEE CAO with transparent and harmonized rules, the implementation of the Third Energy Package and the early implementation of the principles of the CACM Regulation (EU) 1222/2015 along with other forthcoming Network Codes, provide clear **objectives** in this area such as: facilitate better market integration, optimize the utilization of the existing infrastructure and provide the market with more possibilities to exchange energy, enable the cheapest supply to meet demand with the greatest willingness to pay.

Market integration is a key driver for price convergence. As national electricity markets in Contracting Parties remain highly concentrated and mostly characterized by small, incumbent dominated structures, establishing a regional market with price coupling is the only way to bring sufficient liquidity into the respective markets. Therefore, cooperation between national markets and power exchanges in a way that supports swift market integration, highly necessary for integrating the national markets through coupling in order to create a reference price, shall no longer be a distant prospect.