Electricity and Gas Markets in the Energy Community

Status Review 2015

- Part on gas wholesale markets -

April 2016

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I. 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.

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 allows 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* but has also already been in the centre of ECRB activities during the past years.

3. Scope

The present report covers **Albania, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Georgia, Kosovo*, Moldova[2], Montenegro, Serbia** and **Ukraine[3]** related to electricity and gas both on retail and wholesale level with the aim to assess the electricity and gas markets in the Energy Community, identify potential barriers and discuss recommendations on potential improvements. Data presented in this report refers to the year **2014**.

[1] www.energy-community.org. The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, 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 independence*].
[2] Only for the gas wholesale part.
[3] Excluding Crimea.

4. Methodology

Data and analysis provided in this report are based on information provided by the regulatory authorities of the analyzed markets as well as on the EUROSTAT database on energy prices. Where information origins from the 2014 Annual Implementation Report of the Energy Community Secretariat[4], this is explicitly mentioned in the text. Data underlying the presented assessments orientate on the methodology and indicators used for the 2012 and 2013 ACER/CEER *Annual Report on the Results of Monitoring the Internal Electricity and Natural Gas Markets*[5].

[4] http://www.energy-community.org/pls/portal/docs/3356393.PDF.
[5] http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Market%20Monitoring%20Report%202013.pdf and http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2014.pdf

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1. Retail market characteristics
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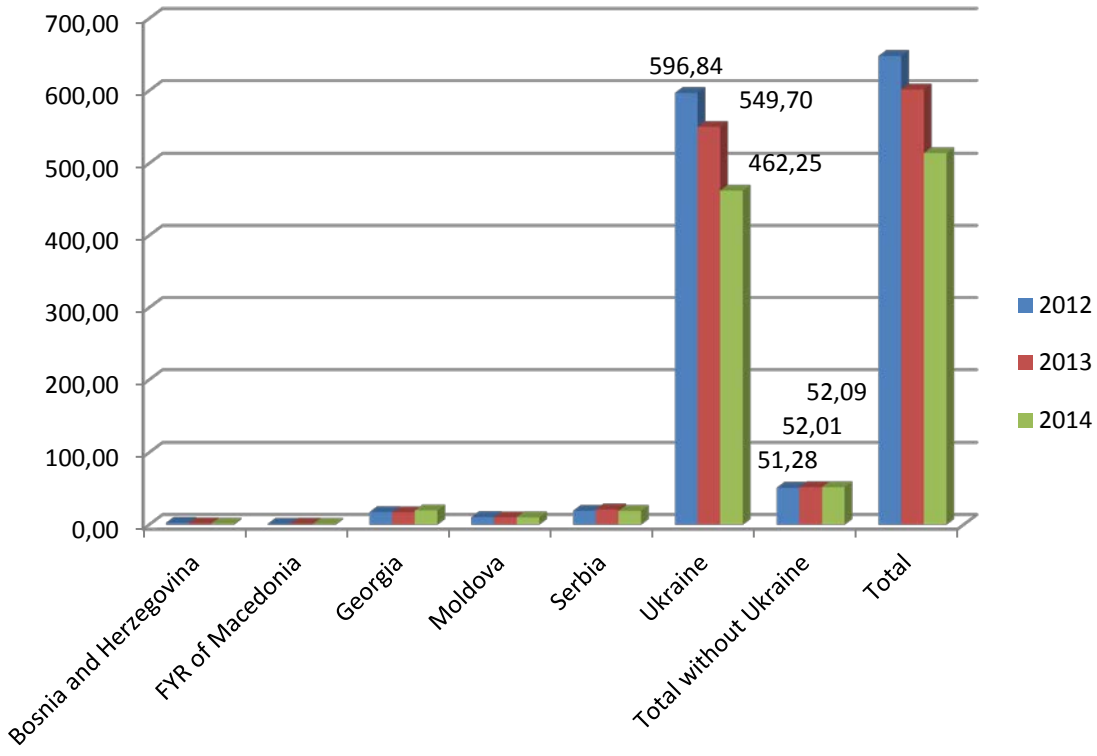
IV. WHOLESALE GAS MARKETS

1. Wholesale market characteristics and prices

The gross inland gas consumption[6] in the Energy Community Contracting Parties and one Observer country (Georgia) decreased on average from 2013 to 2014 by almost 15%. The gas **consumption substantially decreased** in all countries, except Moldova and Georgia.

However, the reasons for consumption decrease differ between the countries. In Ukraine, decrease of consumption was mainly initiated on purpose with the aim of lowering import (dependence). In other countries decline of industry consumption and mild autumn / winter temperatures contributed to the lower gas consumption. The figures below present the gross inland gas consumption in the period 2012- 2014 – including and excluding Ukraine[7] – as well as consumption growth rates by country.

Figure 1: Gross inland gas consumption (in TWh/year)



[6] Calculated as follows: Gross Inland Consumption = production + imports - exports + storage variations
[7] With a view to provide comparability having in mind the size of the Ukraine gas market compared to those of the other analyzed markets.

Figure 2: Gross inland gas consumption without Ukraine (in TWh/year)

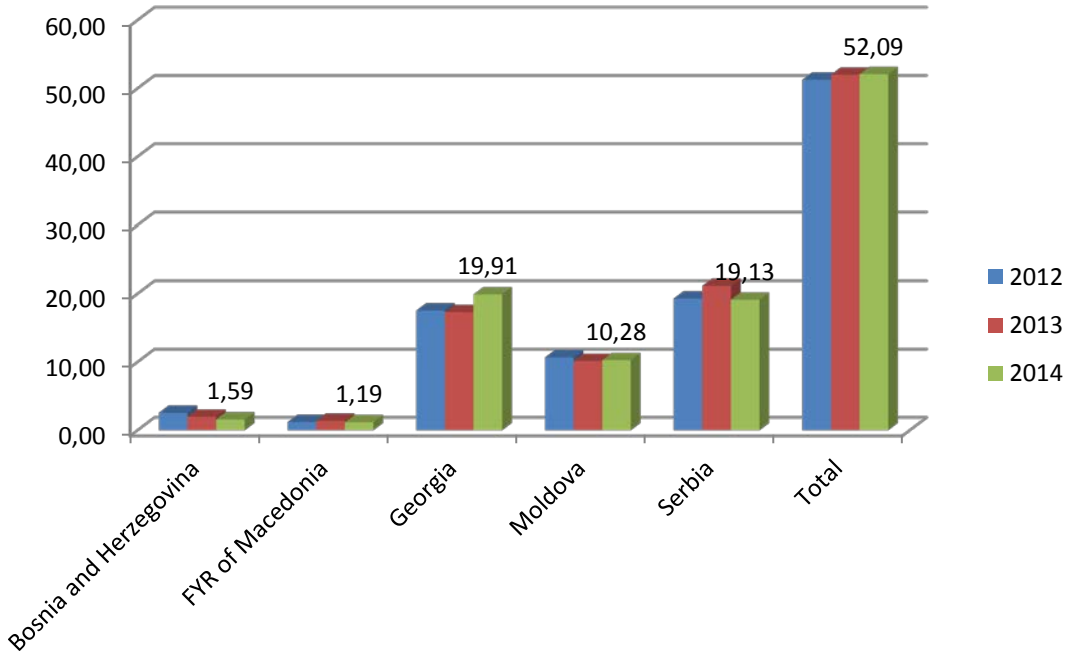
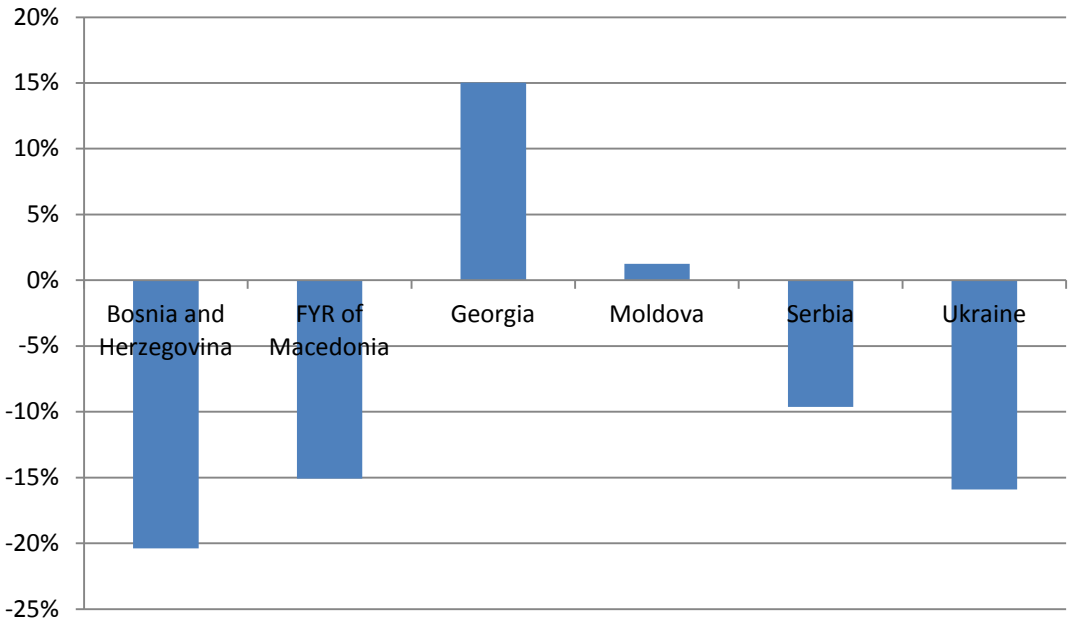


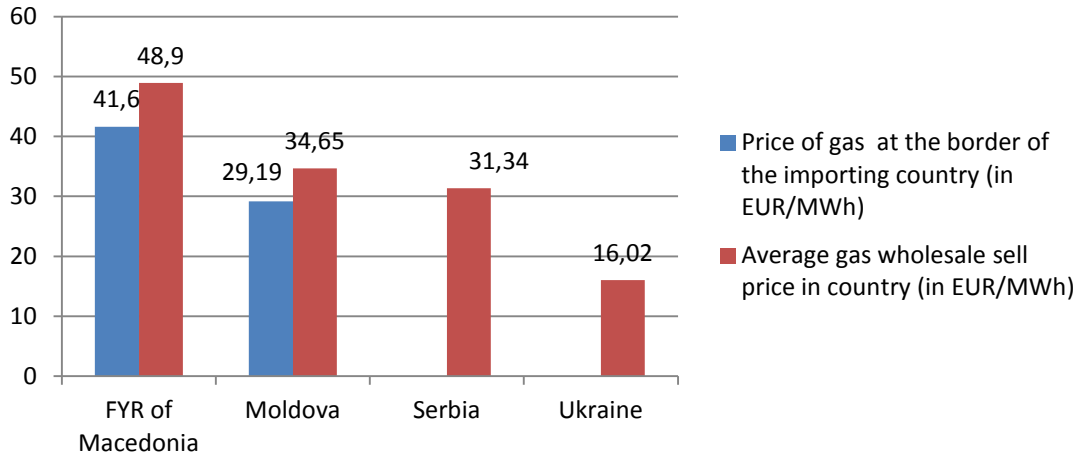
Figure 3: Consumption growth rates 2014/2013



Natural gas is mainly imported to the Energy Community Contracting Parties and Georgia. In Bosnia and Herzegovina and FYR of Macedonia import represents 100% of the final consumption, in Georgia and Moldova more than 99%, in Serbia between 70% and 80%. In Ukraine 46% of the gas consumed in 2014 depended on imports with the majority of gas imported from Russia, 25% of imported gas in 2014 originated from EU countries. In the case of Georgia 90% of total imports originated in 2014 from Azerbaijan, the rest was imported from Russia.

For the countries where related information is available, average yearly prices at the borders of the importing countries as well as the average wholesale sell prices for the years 2013 and 2014 are shown in the figures below. The average weighted price of gas imported from EU countries to Ukraine in the last quarter of 2014 amounted to 26,7 EUR/MWh[8]. Unsurprisingly, in countries with 100% import dependence wholesale prices are higher than border prices; in Serbia these two prices are almost the same, while in Ukraine the average wholesale price is substantially lower due to the low price of domestically produced gas. Average border prices decreased from 2013 to 2014 only in FYR of Macedonia, while in Moldova it slightly rose.

Figure 4: Gas wholesale prices in 2013 (in EUR/MWh)



[8] Recalculated based on the information published at http://naftogaz-europe.com/article/en/StatisticsGasPrices.

Figure 5: Gas wholesale prices in 2014 (in MWh)

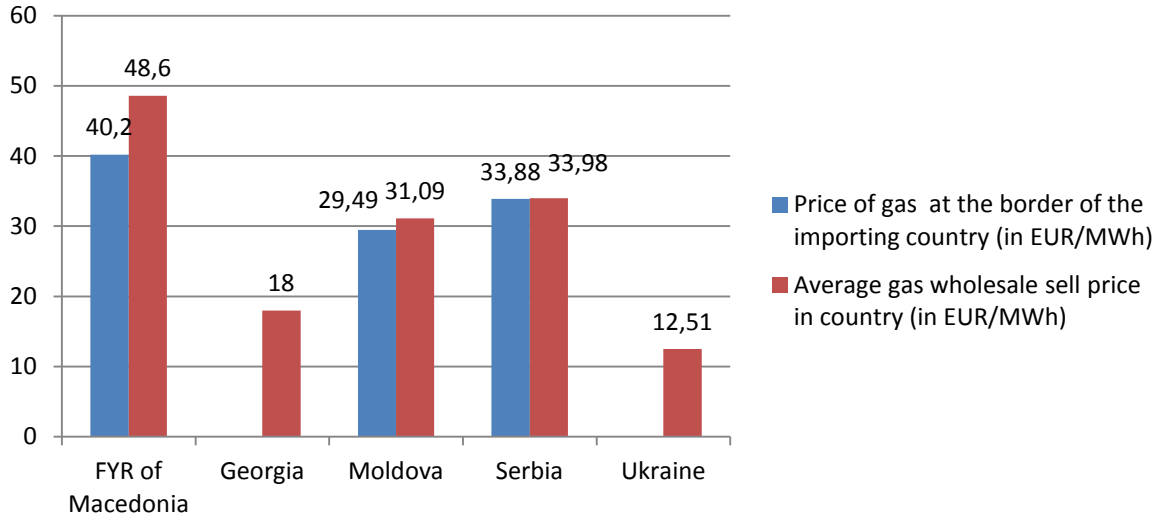


Figure 6: Average gas wholesale price (in EUR/MWh)

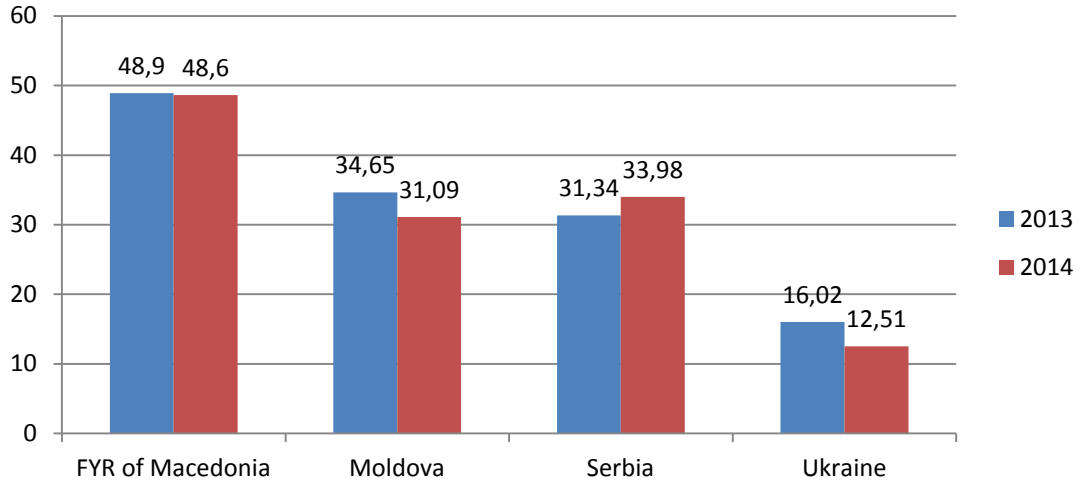
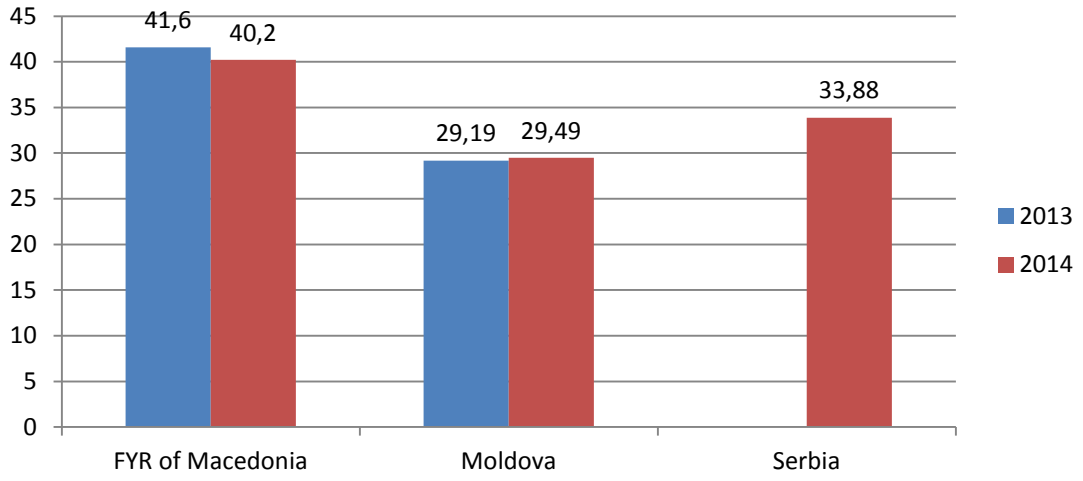


Figure 7: Average yearly price of gas at the border of importing country (in EUR/MWh)



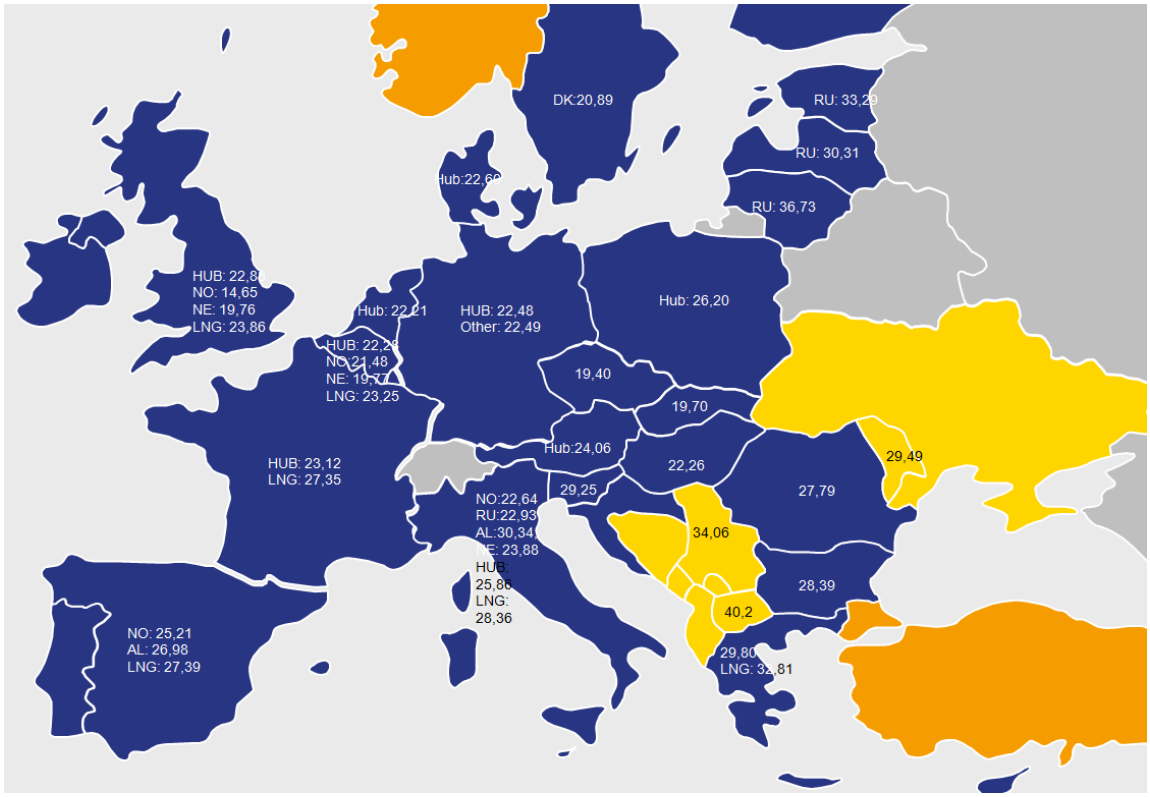
Wholesale price regulation is abandoned in all analyzed markets with the exception of Ukraine where prices for gas produced in state owned production companies are regulated by the national regulator, NEURC, and updated once a year[9].

Gas exchanges do not exist in the Energy Community Contracting Parties. Traders and suppliers active on those markets also do not buy gas on any other gas exchanges but all gas is provided via long-term and short-term bilateral supply contracts[10]. The exact quantities of gas provided via such contracts are usually not available to the regulatory authorities[11]. However, it is known that 50% of gas demand in Georgia is covered by long- term contracts and the rest by short-term contracts. The number of shippers active at the interconnection points varies from one in Bosnia and Herzegovina and Moldova to two in FYR of Macedonia (where also two customers buy gas directly at the interconnection point), three in Serbia, five in Georgia and 17 in Ukraine.

Underdeveloped competitive market conditions – caused by lack of interconnection infrastructure and diversification of sources on one side but also by not fully developed legislative and functional preconditions on the other side – contribute to **higher average yearly prices at the borders of importing countries** compared to wholesale gas prices in the neighboring EU countries. The figure below presents the average yearly border prices for Contracting Parties in 2014 in comparison with estimated border prices for gas from Russia in the period September to November 2014 in a number of neighboring EU countries[12].

[9] With the application of the new Gas Law implementing the 3rd Energy Package this practice changed in 2015: only production price of gas dedicated to fulfilling public service obligation is regulated.
[10] Long- term contracts are those with duration of more than 1 year.
[11] With the exception of the Serbian NRA.
[12] Source for estimated border, hub and LNG prices in EU countries is the Quarterly Report on European Gas Markets, published by DG Energy's Market Observatory for Energy, for the fourth quarter of 2014: https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_2014_q4.pdf.

Figure 8 Estimated border prices of gas imported from Russia, hub and LNG prices in selected EnC CPs and EU MSs in 2014 (for EU countries for period September- November 2014)



Wholesale prices in neighboring EU countries also differ, showing the influence of growing spot markets and diversification on the reduction of prices. There is a *"steady, structural move away from oil indexation in many continental European companies' supply contracts. Contract renegotiations and a series of arbitration cases gave European buyers a reduced exposure to oil by more hub- related pricing or lower level of remaining oil- linked contracts."* [13] According to ACER[14], although the oil- indexed and semi- oil indexed long- term contract prices in CEE and SEE countries remain to be higher than gas hub spot prices, the gap between them narrowed in comparison to previous years.

The comparison is only provisional, due to the lack of comparable data for the Energy Community Contracting Parties. Additionally, it has to be noted that 9 months time lag between oil and gas prices exists in the most of the long term gas contracts and gas hub prices mostly follow oil prices immediately.

[13] SUND Energy Report to the Energy Community, How to get more fair gas prices?, February 2015, https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3648167/Sund_Fair_Gas_Prices_with_cover..pdf.

[14] ACER/CEER, Annual Report on the results of monitoring the internal electricity and natural gas markets in 2013, http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER_Market_Monitoring_Report_2014.pdf, p.173.

Low gas market liquidity and high wholesale prices in the Energy Community Contracting Parties are certainly indicators for **poor market integration**. Efforts towards better integration of the EU and Energy Community gas markets should contribute to increased liquidity and convergence of prices.

Losses resulting from limited integration of national gas markets can be illustrated by a simplified example of calculating welfare losses: average annual consumption per household is multiplied by the difference between estimated average wholesale price in a country and a reference price of Austrian gas hub (see Figure 8). This provides a rough estimate of the potential savings that could be achieved if wholesale markets of the Energy Community Contracting Parties would have similar liquidity and competition levels as Austria[15].

Table 1 Estimated wholesale level of gross welfare losses per EnC CP average household in 2014

Gas hub price in Austria for the period Sep-Nov 2014 24,06 EUR/MWh	Average annual household consumption in 2014 (in MWh)	Average price at the border in 2014 (EUR/MWh)	Difference between average price and gas hub price in Austria for (EUR/MWh)	Gross welfare losses per average household consumer in EUR/year
	1	2	3	4=1x3
Bosnia and Herzegovina	8,25[16]	40,68[17]	16,62	137,11
FYR of Macedonia	8,40	40,2	16,14	135,58
Moldova	4,1	29,49	5,43	22,26
Serbia	6,9	34,06	10,00	69
Ukraine	12,3	26,47[18]	2,41	29,64

This simplified exercise shows that access to liquid gas markets would contribute to the welfare of household customers, especially in countries where no gas transit routes are available, i.e. Bosnia and Herzegovina and FYR of Macedonia. Households would gain certain savings also in other Energy Community Contracting Parties - Moldova, Serbia and Ukraine - if gas supplies would be more diversified.

[15] Other factors such as transmission costs or capacity availability were not taken into account.

[16] Source: BHAS, Survey on Energy consumption in households in Bosnia and Herzegovina

[17] Source: BH Gas, the sole importer of gas to BIH

[18] http://naftogaz-europe.com/article/en/StatisticsGasPrices
Average price at the border in the 4th quarter 2014 = 360 USD/1000 m3.
Average exchange rate of EUR/USD in the 4th quarter 2014 = 1.2498

2. Market dominance

Market concentration is an important indicator for assessing the performance of wholesale markets. In its European Gas Target Model [19] ACER included the **Herfindahl- Hirschmann Index** (HHI) in the list of market health metrics and set a threshold of ≤ 2000 above which markets are considered as concentrated. HHI is HHI calculated as sum of squared market shares (in %) of all different upstream companies supplying a market at import level (i.e. sourcing the gas into the country, not by the shares of the companies buying this gas in a country). The table below summarized HHIs for Energy Community Contracting Parties.

Table 2 HHI for wholesale gas markets in the Energy Community Contracting Parties and Georgia, calculated for shares in 2014

Country	Herfindahl- Hirschmann Index
Bosnia and Herzegovina	10.000
FYR of Macedonia	10.000
Moldova	9.980
Serbia	10.000
Ukraine	4.333[20]
Georgia	3.769

Other indicators showing dominance on the gas market are the number of companies selling at least 5% of available gas and the market share of the three biggest companies. Relevant results for the assessed markets are shown hereinafter.

[19] http://www.acer.europa.eu/Events/Presentation-of-ACER-Gas-Target-Model-/Documents/European%20Gas%20Target%20Model%20Review%20and%20Update.pdf.
[20] Calculated based on: http://www.theinsider.ua/rus/business/kto-i-otkuda-postavlyal-gaz-v-ukrainu.NRA cannot confirm this information.

Table 3 Dominance of wholesale supply companies in gas markets of the Energy Community Contracting Parties and Georgia in 2014

Country	Number of companies selling at least 5% of available gas[21]	Shares of 3 biggest companies in the market (in %)		
		1	2	3
Bosnia and Herzegovina	1	100	-	-
FYR of Macedonia	3	34,3	32,4	29,52
Moldova	3	62,10	9,10	5,70
Serbia	2	75	25	-
Ukraine	At least 1, data not available	N/A	N/A	N/A
Georgia	4	45	37	11

Both market concentration indicators presented above show that the **gas markets of the Energy Community Contracting Parties and Georgia are highly concentrated** i.e. only very limited number of companies with substantial market shares are sourcing gas to the analyzed national markets.

3. Transmission tariffs and network access regimes

Tariffs for transmission network access as well as the methodologies used for their calculation significantly influence gas trade, liquidity and competition. Furthermore they also affect wholesale market integration. Therefore Directive 2009/73[22] and Regulation 715/2009[23] require that network tariffs are transparent and non- discriminatory (avoiding cross- subsidies between network users), providing incentives for investments and interoperability of networks as well as created so not to restrict market liquidity or trade across borders of different transmission systems. In order to facilitate development of such tariffs and tariff

[21] Available gas calculated as: available gas = gross inland consumption (production + net imports + storage variations).
[22] Directive 2009/73/EC of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, OJ L 211, p 94 et seq.
[23] Regulation (EC) 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) 1775/2005, OJ L 211 p 36 et seq.

methodologies, ACER published Framework Guidelines on harmonized Transmission Tariff Structure on whose ground ENTSO-G prepared and submitted to the European Commission relevant Network Code[24].

Still not obliged to set tariffs for each entry and exit point separately in 2014[25], TSOs and NRAs of the analyzed markets were implementing **post stamp methodologies** for calculation of transmission tariffs. Average transmission tariffs in 2014 are presented in the table below.

Table 4 Average yearly transmission tariffs in 2014 (in EUR/GWh)

Country	Average transmission tariffs in 2014 (in EUR/GWh)	Share of transmission costs in the end- user price of gas (in %)	
		industry	households
FYR of Macedonia	2487	N/A	N/A
Moldova	110	0,38	0,34
Serbia	992	2,6	2,4
Ukraine	671,98	N/A	4
Georgia	564	1,7-2,2	3,6

Average gas transmission tariffs in 2014 differ a lot among Energy Community Contracting Parties, staring from only 110 EUR/GWh in Moldova to 2487 EUR/GWh in FYR of Macedonia. Without detailed investigation of costs included in the allowed revenue or transmission tariff structures, it is not possible to explain precisely the reasons for such differences. However, in the case of FYR of Macedonia it is the huge investment costs in relation to still low usage of transmission network contributing to the very high transmission tariffs. The current shares of transmission tariffs in the end-user prices of gas are estimated to 2-4% in Georgia, Serbia and Ukraine. However the transmission network charges are *per se* more stable that gas commodity prices i.e. the shares fluctuate with the changes in gas prices.

The main principles of transmission tariff settings as well as tariff structures are presented in the table below.

[24] http://www.entsog.eu/publications/tariffs#TAR-NC-RE-SUBMITTED-TO-ACER.
[25] Contracting Parties were obliged to transpose the Third Energy Package by 1 January 2015.

Table 5 Principles of transmission tariffs calculation in the Energy Community Contracting Parties and Georgia

Country	Cost allocation methodology		Price control mechanism		Role of NRA in tariff setting		Role of TSO		Tariff recovery basis	
	Post stamp	other[26]	Price cap	Revenue cap	Fixing methodology	Approval of tariffs	Methodology proposal	Calculation of tariffs	Capacity (%)	Commodity (%)
Bosnia and Herzegovina	x									
FYR of Macedonia	x			x	x	x	x	x	0	100
Moldova	x			x		x		x		100
Serbia	x			x	x	x		x	30	70
Ukraine	x		x		x	x		x	0	100
Georgia	x		x		x	x			0	100

[26] E.g. Locational signals considered, capacity weighted distance.

As mentioned above, transmission tariffs in all Energy Community Contracting Parties were still not calculated based on an entry/exit model but the cost allocation methodology applied is a postage stamp model whereby all costs are allocated to system users at their exits from the transmission system and expressed in monetary unit per m3 or m3/day/year (the latter only in Serbia, where certain proportion of costs is allocated to capacity) on yearly basis. Capacities are not offered for periods shorter than one year, therefore there are **no multipliers for calculating short-period tariffs**.

In all countries except Moldova tariff methodologies are **fixed by the regulatory authorities** (in FYR of Macedonia methodology is proposed by the TSO), tariffs are calculated by the TSOs and finally approved by the regulators. In the Energy Community Contracting Parties there are no **dedicated transit pipelines** with particular conditions. The exception is the Ananiev – Tiraspol – Izmail (ATI) Pipeline in Moldova. In Georgia, a section of South Caucasus Pipeline (or Baku - Tbilisi –Erzurum pipeline) is a transit pipeline that is operated by BP, not the Georgian TSO. Through one interconnection point the South Caucasus Pipeline is linked to the Georgian transmission system.

Beside capacity tarification, transparent and non-discriminatory **capacity allocation** harmonized on interconnection points between TSOs is another important prerequisite for having liquid and competitive wholesale gas markets. On EU level Regulation (EC) 984/2013[27] requires harmonized allocation procedures and standardized product duration at cross-border IPs to enhance hub liquidity and facilitate gas. Said Regulation, alongside with other EU Third Package related Network Code Regulations[28], is still not applicable for the interconnection points between EU Member States and Energy Community Contacting Parties[29] as well as between the Energy Community Contracting Parties. It goes without saying that capacity allocation harmonization among all European countries would bring benefits for gas trade and market development.

Before providing an overview of the capacity allocation and congestion management procedures implemented in the Energy Community Contracting Parties, it is worth noting the capacity utilization at interconnection points between those countries.

27 Regulation (EC) 984/2013 establishing a Network Code on Capacity Allocation Mechanisms in Gas Transmission Systems and supplementing Regulation (EC) No 715/2009 of the European Parliament and of the Council (OJ L 273 of 15.10.2013, p 5 et seq)
28 On balancing, interoperability as well as on congestion management mechanisms.
29 Unless a NRA of an EU MS decides that at its particular IPs with EnC CPs NC provisions are implemented.

Table 6 Cross- border capacity utilization in the Energy Community Contracting Parties and Georgia in 2014

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization[30] (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
Sudzha	RU-UA	3.565.923,29	80,03%	2.883.614,07	1.412.377,26	2.588.334,46
Pisarevka	RU-UA	1.608.811,88	50,59%	957.577,95	390.613,99	650.233,82
Sokhranovka	RU-UA	1.525.883,44	23,70%	245.773,56	120.361,05	277.485,79
Serebryanka	RU-UA	431.227,98	0,00%	18.123,71	0	0
Valuyki	RU-UA	845.870,16	65,99%	339.641,50	219.864,40	436.700,51
Mozyr	BY-UA	199.028,25	89,20%	127.969,14	16.977,92	110.254,20

[30] Calculated as peak daily import/export gas flow divided with technical import/export capacity

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization[30] (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
Kobryn	BY-UA	958.652,92	25,72%	132.172,28	76.835,95	162.583,78
Platovo	RU-UA	175.481,94	51,49%	36.068,67	13.514,09	67.504,32
Germanowize	PL-UA	46.784,91	107,93%	46.784,91	26.120,67	44.448,50
Beregdarog	HU-UA	182.787,57	58,24%	182.787,57	17.457,52	77.738,79
Uzhgorod	UA-SK	2.517.708,00	61,94%	2.303.415,53	935.286,57	1.126.907,13
Budince	SK- UA	435.208,50	83,19%	109.710,00	105.936,06	328.089,33
Beregovo	UA-HU	437.862,19	64,34%	386.918,20	193.804,77	271.095,62
Dozdovichi	UA-PL	165.856,87	94,75%	142.784,18	103.273,67	144.539,27

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization[30] (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
Orlovka	UA-RO	888.993,01	88,68%	603.628,21	536.137,38	669.921,13
Tekovo	UA-RO	149.271,18	37,85%	48.290,30	1.324,67	8.825,27
Moldova (all)[31]	UA-MD	116.099,81	152,59%	94.493,88	84.740,21	137.967,41
ACB (Aneniev-Cernauti-Bogorodceni)	UA-MD	267.000[32]	10,32%	28.490,37	27.542,60	4.504,28

[31] Data provided by Ukrainian NRA and TSO.

[32] Used in direction UKR-MD, 82.6% of volume is for the national market, the rest for transit

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
RI (Razdelinaia – Izmail)	UA-MD	390.000[33]	16,16%	65.154,76	62.987,32	8.853,74
ŞDKRI (Şebelinka – Dnepropetrovsk – Krivoi Rog – Razdelinaia – Izmail)						
ATI (Ananiev – Tiraspol – Izmail)	UA-MD	534.000[34]	80,57%	444.962,79	430.160,65	43.508,58

[33] 7% of transported volume are for country consumption, 93%- for transit

[34] Exclusively for transit

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
ACB (Aneniev-Cernauti-Bogorodceni)	MD-UA	266.963,31[35]	1,74%	4.189,12	4.655,84	593,61
RI (Razdelinaia – Izmail)	MD-UA	389.766,43[36]	15,03%	60.480,46	58.585,10	8.151,55
ŞDKRI (Şebelinka – Dnepropetrovsk – Krivoi Rog – Razdelinaia – Izmail)						
ATI (Ananiev – Tiraspol – Izmail)	MD-UA	533.926,62[37]	80,43%	444.171,93	429.415,82	43.384,98

[35] Used in direction UKR-MD, 82.6% of volume is for the national market, the rest for transit

[36] 7% of transported volume are for country consumption, 93%- for transit

IP	Border and direction	Pipeline technical import/export capacity (in MWh/day)	Maximum import/export pipeline utilization (in %)	Average yearly firm contracted capacity (in MWh/day)	Average yearly used capacity (in MWh/day)	Peak capacity utilization on monthly average (in MWh/day)
Kyustendil-Zidilovo	BG-MK	1.267,32	41,66%	1.894	3.637	9.096
Horgos	HU-SRB	125.525	81,62	92.936,65	65.050,69	72.759
Zvornik	SRB-BIH	17.863	70,14	17.863,15	4.891,88	9.161
Zvornik[38]	SRB-BIH			19.450,00	4.149,00	11.359,00

[37] Exclusively for transit
[38] Data provided by BH Gas

In 2014 transmission capacity was still allocated bundled with gas quantities transported.

Rules for **congestion management** were also not in place in 2014. However, as shown in table 6 in many Energy Community Contracting Parties network capacities are underusedliquid i.e. interconnection capacities are more used.. On the other hand, on several interconnection points between Ukraine and its neighboring gas markets, namely Poland and Moldova, available capacities were utilized more than 100% in 2014 in peak situations which strongly calls for efficient congestion management procedures.

No market based **balancing** rules were implemented in the Energy Community Contracting Parties and Georgia in 2014. Furthermore imbalance charges were not calculated and only linepack was used as source for balancing gas.

Transparency of network access conditions is a crucial prerequisite for well functioning gas markets - only when access to relevant information is provided in fair and non-discriminatory manner to all existing and potential network users, entry barriers can be avoided and competition increased. ECRB therefore developed an analysis of compliance of TSOs and NRAs with the transparency requirements of Regulation (EC) 715/2009. The results revealed very low degree of TSOs' compliance with the legal requirements: only applicable network codes are published on the web pages of TSOs. NRAs in general comply with transparency: methodologies for transmission tariffs calculation as well as applicable tariffs[39] are published in all cases.[40]

4. Utilization of underground gas storage

Gas storages play an important role in meeting gas demand. They may be used to cover base load demand, seasonal swings, short-run peak requirements and disruptions and are also a central security of supply tool.

Among the Energy Community Contracting Parties, only Serbia and Ukraine have gas storage, namely:

- One gas storage facility, Banatski Dvor, in Serbia with capacity (working gas) of 4.345 GWh, maximum injection capacity of 26.070,53 MWh/day and maximum withdrawal capacity of 43.450,89 MWh/day;
- 12 storage facilities in Ukraine with a total capacity of 336.742,58 GWh, maximum injection capacity of 2.883.256,32 MWh/day and maximum withdrawal capacity of 3.046.459,51 MWh/day;

Total yearly withdrawals in 2013 covered on average 24,40% of gas demand in Ukraine and 12,20% in Serbia. These percentages would be even higher when calculated only for winter months (up to 50%). The related dynamics can be seen in the graphs below.

Figure 9 Monthly gas demand in comparison to storage withdrawals in Ukraine

[39] Where the NRA provides approval.

[40] Details of the analysis are available from : ECRB, Compliance review – transparency of the Energy Community gas markets, 2016.

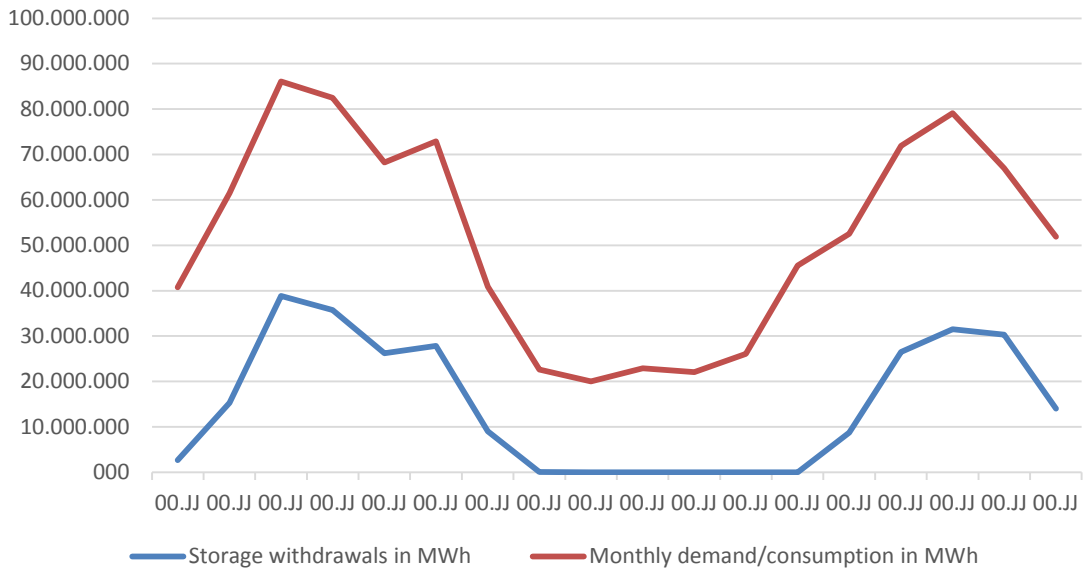
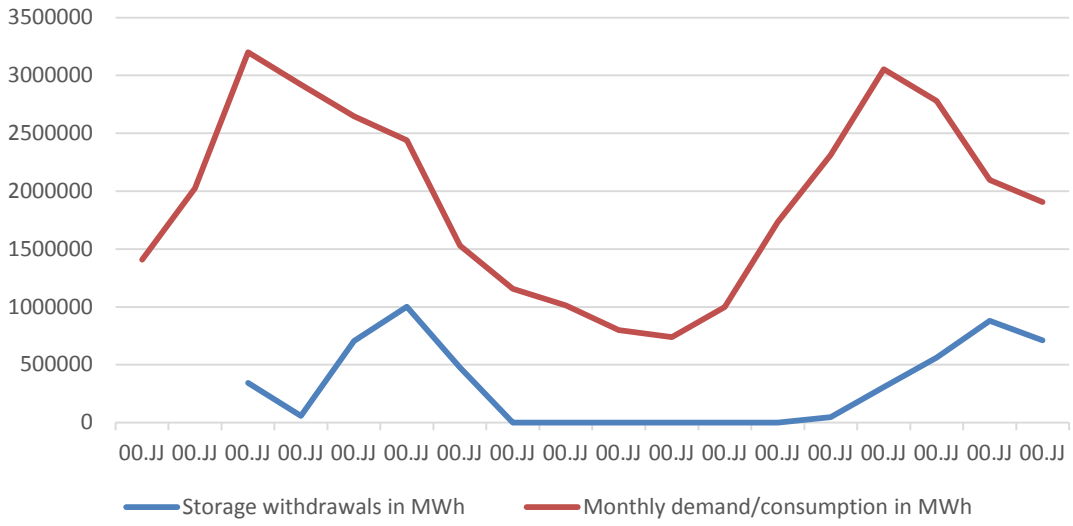


Figure 10 Monthly gas demand in comparison to storage withdrawals in Serbia



Availability of gas storage has positive effects on the liquidity of gas markets, not only because it offers necessary flexibility but also can put downward pressure on gas prices during autumn/winter months.

5. Summary and conclusions

The gross inland gas consumption in the Energy Community Contracting Parties and one Observer country (Georgia) decreased on average from 2013 to 2014 by almost 15%. **The gas consumption substantially decreased** in all countries, except Moldova and Georgia.

Natural gas is **mainly imported** to the Energy Community Contracting Parties and Georgia. Domestic production represents a substantial part of consumption only in Ukraine.

Average yearly **prices** of gas at the borders of the importing countries in 2014 range between 29,49 EUR/MWh in Moldova to 40,2 EUR/MWh in FYR of Macedonia. Average wholesale sell prices for the year 2014 vary from only 12,51 EUR/MWh in Ukraine to 48,6 EUR/MWh in FYR of Macedonia. Unsurprisingly, in countries with 100% import dependence wholesale prices are higher than border prices; in Serbia these two prices are almost the same, while in Ukraine the average wholesale price is substantially lower due to the low price of domestically produced gas. Average border prices decreased from 2013 to 2014 only in FYR of Macedonia, while in Moldova it slightly rose.

Wholesale price regulation did not exists in the analyzed markets in 2014 except Ukraine where prices for gas produced in state owned production companies are regulated by the national regulator and updated once a year.

Gas exchanges do not exist in the Energy Community Contracting Parties. Traders and suppliers active on those markets also do not buy gas on any other gas exchanges but all gas is provided via long-term and short-term bilateral supply contracts. The **number of shippers active at the interconnection points is very limited**, only in Ukraine their number is high.

Underdeveloped competitive market conditions – caused by **lack of interconnection infrastructure and diversification of sources** on one side but also by **not fully developed legislative and functional preconditions** on the other side – contribute to higher average yearly prices at the borders of importing countries compared to wholesale gas prices in the neighboring EU countries.

Low gas market liquidity and high wholesale prices in the Energy Community Contracting Parties are certainly indicators of **poor market integration.** Efforts towards better integration of the EU and Energy Community gas markets should contribute to increased liquidity and convergence of prices.

The Herfindahl-Hirschmann Index (HHI), an important indicator for assessing the market concentration and performance of wholesale markets in general, is much above the threshold set by ACER in its Gas Target Model (2.000), in some Contracting Parties even 10.000. Other indicators showing dominance on the gas market are the number of companies selling at least 5% of available gas and the market share of the three biggest companies. Both of them also showed that **gas markets of the Energy Community Contracting Parties and Georgia are highly concentrated**, i.e. only very limited number of companies with a substantial market shares are sourcing gas to the national markets.

Still not obliged to set tariffs for each entry and exit point separately in 2014, TSOs and NRAs of the analyzed markets were implementing **post stamp methodologies for calculation of transmission tariffs** expressed in monetary unit per m3 or m3/day/year on yearly basis. Average gas transmission tariffs in 2014 differ a lot among the Energy Community Contracting Parties, staring from only 110 EUR/GWh in Moldova to 2487 EUR/GWh in FYR of Macedonia. Without detailed investigation of costs included in the allowed revenue or transmission tariff structures, it is not possible to explain precisely the reasons for such differences. However, in the case of FYR of Macedonia huge investment costs in relation to still low usage of transmission network contribute to the very high transmission tariffs. The current shares of transmission tariffs in the end-user prices of gas are estimated to 2-4% in Georgia, Serbia and Ukraine. However the transmission network charges are *per se* more stable that gas commodity prices i.e. the shares fluctuate with the changes in gas prices.

Capacities were not offered for periods shorter than one year in 2014, therefore there are no multipliers for calculating short-period tariffs. In all countries except Moldova tariff methodologies are fixed by the regulatory authorities (in FYR of Macedonia the methodology is proposed by the TSO), tariffs are calculated by the TSOs and finally approved by the regulators. In the Energy Community Contracting Parties there is **only one dedicated transit pipeline with particular conditions**, namely in Moldova. In Georgia one transit pipeline operated by a company other than national TSO.

In 2014 transmission capacity was still allocated bundled with gas quantities transported.

Rules for **congestion management** were not in place in 2014. However, in many Energy Community Contracting Parties the capacities are underused, which limits the need for congestion management rules. On the other hand, on several interconnection points between Ukraine and its neighboring gas markets, namely Poland and Moldova, available capacities were utilized more than 100% in peak situations in 2014 which strongly calls for efficient congestion management procedures.

No market based **balancing** rules were implemented in the Energy Community Contracting Parties and Georgia. Furthermore imbalance charges were not calculated and only linepack was used as source for balancing gas.

Analysis of the compliance of TSOs and NRAs with the transparency requirements of Regulation 715/2009 reveals a very low degree of TSOs' compliance but, in general, good performance of NRAs.

Among the Energy Community Contracting Parties, only Serbia and Ukraine have **gas storage.** Total yearly withdrawals in 2013 covered on average 24,40% of gas demand in Ukraine and 12,20% in Serbia. These percentages would be even higher when calculated only for winter months (up to 50%).

Finally, the main characteristics of the wholesale gas markets in the Energy Community Contracting Parties and Georgia, as proven by the information available in this report, may be summarized as follows:

- Lack of adequate gas infrastructure,
- Lack of liquidity,
- Long-term commitments to supply, cross- border capacity and storage reservations,
- Lack of transparent and non- discriminatory TPA rules and
- Lack of transparency

Besides stimulating investments in gas infrastructure, especially cross- border, full and effective implementation of the Third Package is a prerequisite for improving gas market development. Activities directed towards gas market integration are needed for further diversification of gas supplies, increase of liquidity and decrease of wholesale prices. Therefore the implementation of the Third Package related Network Code Regulations not only in the Energy Community Contracting Parties but also on interconnection points between them and the EU Member States is of utmost importance for creating a common liquid, diversified and competitive European gas market.