



Balancing of Gas Transmission Networks in the Energy Community

- A Status Review -

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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 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.¹ 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

Regulation (EC) 715/2009 on conditions for access to the natural gas transmission networks,² applicable in the Energy Community Contracting Parties (hereinafter "Contracting Parties") since 2015, sets non-discriminatory rules for access to gas transmission networks with a view to ensure proper functioning of gas markets. Market based balancing rules that impose balancing responsibilities on network users foster liquidity and contribute to more competition in the markets.

Article 28 of Ministerial Council Decision 2011/02/MC-EnC provides that, upon proposal of the European Commission, network codes developed by the European Commission under Regulation (EC) No 715/2009 shall be adopted by the Permanent High Level Group.

The Contracting Parties are in the process of transposing and implementing the EU gas network codes for more than two years. The following network codes have been adopted in January and November 2018:

- Regulation (EU) 703/2015 establishing a network code on interoperability and data exchange rules;³

¹ www.energy-community.org. The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, North Macedonia, Georgia, Kosovo*, Moldova, Montenegro, Serbia 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 1244/1999 and the ICJ Advisory Opinion on the Kosovo declaration of independence.

² Adapted and adopted for the Contracting Parties by Decision 2011/02/MC-EnC of the Ministerial Council. Cf. https://www.energy-community.org/dam/jcr:d0f7d046-57cb-479a-a39a-9bce06065155/Regulation_715_2009_GAS.pdf.

³ https://www.energy-community.org/dam/jcr:3212c2b3-5bd6-4473-86f4-f06fbcca3735/Regulation_2015_703_GAS.pdf

- Annex I to Regulation (EC) 715/2009 as amended by Commission Decision (EU) 2012/490 and Commission Decision (EU) 2015/715 (“network code on congestion management procedures”);⁴
- Regulation (EU) 459 /2017 establishing a network code on capacity allocation mechanisms in gas transmission system (‘CAM NC’)⁵; and
- Regulation (EU) 460/2017 establishing a network code on harmonized transmission tariff structures for gas (‘TAR NC’).⁶

In 2014, Regulation (EU) 312/2014 establishing a **network code on gas balancing of transmission networks**⁷ (hereinafter ‘BAL NC’) was adopted for the European Union. It sets detailed balancing rules, including rules on nomination procedures, imbalance charges, settlement processes associated with the daily imbalance charge and operational balancing between transmission networks. Negotiations on adaptations of the BAL NC for the Contracting Parties were launched in early 2019.⁸

In the light of this, the ECRB Gas Working Group decided to investigate the balancing practices in the Contracting Parties, identifying at the same time gaps between the current status and the requirements of the BAL NC. In addition, information on the BAL NC implementation in the EU Member States Croatia and Poland – both neighboring Contracting Parties – provides valuable contribution to the analysis.

3. Scope and methodology

The present report covers those Contracting Parties where a gas market is operational, namely Bosnia and Herzegovina (entity Republika Srpska), North Macedonia, Georgia, Moldova, Serbia and Ukraine. In addition to the Contracting Parties, the report includes also information for Croatia and Poland.

Data presented in this report refers to the **status quo in March 2019**. To highlight the ongoing reform processes in the gas transmission system balancing regimes in the Contracting Parties, the survey also explains balancing rules applied in 2018, where relevant.

Data and analyses shown in the present report are based on information provided by the relevant national regulatory authorities (‘NRAs’; ‘regulators’).

⁴ https://www.energy-community.org/dam/jcr:c7dde5f9-a070-48c9-9a9e-a07677e7206f/Decision_2018_01_PHLG.pdf

⁵ https://www.energy-community.org/dam/jcr:c932ed78-7d53-4795-84b5-613d45cd1c7b/Decision_2018_06_PHLG-EnC_GasReg_112018.pdf

⁶ https://www.energy-community.org/dam/jcr:d40b64ae-08d9-4eb1-b361-660bafdd5342/Decision_2018_07_PHLG-EnC_GasReg_112018.pdf

⁷ Commission Regulation (EU) No 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks Text with EEA relevance, OJ L 91, 27.3.2014, p. 15–35, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.091.01.0015.01.ENG.

⁸ Adoption of the adapted version by the Permanent High Level Group is still pending and envisaged by end of 2019.

FINDINGS

1. Principle observations

Gas balancing mechanisms and the related regulatory framework differ widely among the analyzed countries. **Croatia and Poland** have already achieved the implementation of the BAL NC and succeeded in creating trading platforms for gas balancing purposes, while the Contracting Parties are still in the process of implementing the balancing principles of Regulation (EC) 715/2009. The main reasons are different development levels of gas infrastructure and markets as well as the fact that EU Member States started implementing EU legislation much earlier than the Energy Community Contracting Parties. Also, the BAL NC is not yet applicable in the Contracting Parties, different from EU Member States.

The balancing rules enshrined in the regulatory framework of **Serbia** are not applied in praxis so far. Therefore all answers to the questions analyzed in this report are only related to the regulatory framework in place.

In **Moldova** the balancing mechanism is currently not regulated. The transmission system operators (TSO) fulfil duties of dispatching necessary to manage quantities of natural gas in the transmission system network. The responsibility of network users to be balanced is defined in the supply contracts. By the end of 2019 the regulatory authority (ANRE) envisages to adopt new market rules that will regulate the obligations of the natural gas market participants in relation to balancing, calculation of imbalances caused by network users and respective financial payments. Taking into account the above mentioned, the balancing system of Moldova is not described in this report.

The gas transmission system in **North Macedonia** balancing rules are defined in the relevant transmission network code but are not fully applied.⁹ The regulatory authority of North Macedonia (ERC) is in the process of harmonizing the regulatory rules with the Third Energy Package requirements.

For **Ukraine** the present analysis provides two-fold information: first, related to the balancing mechanism that was in force during the preparation of this report in 2018/2019. Due to the fact that balancing rules changed substantially as of 1 March 2019 following the amendments made to the national Gas Transmission Network Code targeting the implementation of the BAL NC, also information related to the new applicable balancing rules is provided.

In **Georgia** balancing rules will change in 2020 in accordance with the Natural Gas Network Code adopted by the Georgian regulator (GNERC). The information provided in the present report relates to the situation in 2018 and 2019 but also gives insights

⁹ According to the rules network users are in theory responsible for balancing their in- and off-takes. However, a tolerance level of 10% is applicable (on details see chapter 5) and imbalances do not impact on operational stability of the underutilized gas transmission system of North Macedonia.

on relevant elements of the new Network Code provisions that will become effective in 2020.

2. Basic balancing elements and prerequisites

Obliging network users to be balanced at the end of a certain balancing period is the basic target of balancing rules.¹⁰ In **all analyzed countries** network users are responsible for their inputs in and offtakes from the transmission system while the transmission system operator fulfills only operational balancing to keep the transmission network within its operational limits.¹¹

Understanding of how this responsibility is incentivized and regulated is important for analyzing whether the principles of non-discrimination, transparency and fairness are met and whether the balancing rules are market based.

Table 1 Balancing mechanism in general

	Responsibility of network users	Balancing period	Information provision	Gas market operator ¹²	Balancing zones	Balancing groups
Bosnia and Herzegovina	yes	daily and monthly	yes, free of charge	no	2	no
Georgia	yes	monthly	no ¹³	no	1	no ¹⁴
North Macedonia	yes	daily and monthly	no	no	1	no
Serbia	yes	daily	no	no	1	no
Ukraine	yes	daily ¹⁵ (since March 2019) Monthly (until March 2019)	Yes in daily, no in monthly	no	1	yes (since 20.04.2019)
Croatia	yes	daily	yes, free of charge	yes	1	yes, compulsory
Poland	yes	daily	yes, free of charge	no	3	yes, not compulsory

¹⁰ Cf Article 4(1) BAL NC.

¹¹ Cf Article 6 BAL NC.

¹² “No” means that the function of a market operator is fulfilled by the TSO.

¹³ According to the new network code the TSO provides information related to allocations on daily basis and free of charge.

¹⁴ The new network code allows network users to form a balancing group.

¹⁵ In August 2018 the amendments to the transmission network code came into force that introduced a daily balancing mechanism. Practical implementation of this reform was delayed until March 2019 though. The main obstacle for switching to the daily balancing regime was the absence of a special IT system for balancing purposes which would assist the TSO to process nominations and provide allocation to network users on a daily basis; around 300 shippers were active in the second quarter of 2018.

In **Georgia**, the responsibility of network users are defined in the gas purchase contract: network users have to inform the TSO about the source and quantity of balancing gas when they applying for a gas transportation contract. The Natural Gas Network Code adopted in 2018 is supposed to introduce a new balancing mechanism in 2020: the transmission system operator will have to take balancing measures when necessary and receive financial compensation from respective network users.

Balancing period

The BAL NC requires the establishment of a daily balancing regime; voluntarily the regulator may also decide to implement hourly balancing, i.e. within day obligations. Daily balancing is applied in **Poland, Croatia and Serbia**; in **Ukraine** monthly balancing applied until March 2019, since then a daily balancing regime is in place.

Monthly balancing is applied in **Georgia**. Both daily and monthly balancing regimes are in place in **North Macedonia** and in **Bosnia and Herzegovina**.

Information requirements and appointed forecasting party

Article 21 of Regulation (EC) 715/2009 foresees that the transmission system operator should provide network users with sufficient, well-timed and reliable on-line based information on the balancing status of network users in order to enable them taking corrective action timely. No charge shall be required for the provision of this information. Table 1 shows that

- only in **Poland, Croatia and in Bosnia and Herzegovina** this information is provided to network users free of charge.
- in **Georgia, Serbia and North Macedonia** the required information is not provided to network users online at all. In Georgia the obligation to provide information on daily allocations and imbalances will be introduced in 2020. The transmission system operator of Serbia already started providing network users with the necessary information on their imbalance quantities to allow them to reduce deviations, although there are no charges for imbalances yet.
- in **Ukraine** this requirement is implemented since March 2019.

The BAL NC stipulates more detailed requirements for information provision, including information obligations of distribution system operators and forecasting parties towards the transmission system operator and the requirement of information models that can be applied in case of non-daily-/daily-/intraday- metered inputs and off-takes¹⁶ These BAL NC requirements on information details are **not met in the Contracting Parties** and there is **no appointed forecasting party**, except in Ukraine.

¹⁶ Cf Article 32 BAL NC *et seq.* A forecasting party has to be designated by the NRA pursuant to Article 39 (5) BAL NC.

In **Poland**, the distribution system operator was appointed as the forecasting party by decision of the NRA in 2016. In **Croatia**, the transmission system operator has been designated as forecasting party in April 2017. In **Ukraine**, since 1st March 2019 distribution system operators are responsible forecasting parties for predicting consumption in their distribution systems.

Gas market operator

A separate gas market operator was established only in **Croatia**. It is responsible for calculation and invoicing Balancing Responsible Parties with daily imbalance charges, balancing actions charges and neutrality arrangements. The gas market operator of Croatia also performs the role of a trading platform operator.

In **all other** analyzed countries, the function of a market operator is covered by the transmission system operator.

Balancing zones and balancing groups

There are three balancing zones in **Poland**: the high methane balancing zone, the low methane balancing zone and the transit gas pipeline system Yamal-Western Europe (TGPS).

Two balancing zones exist in **Bosnia and Herzegovina**: Republic Srpska and Federation BIH.

All other countries have one balancing zone.

The creation of a balancing group among network users is obligatory in **Croatia** and voluntary in **Poland**. In **Ukraine** balancing groups are allowed since 2019. All other countries do not practice grouping of network users to allow them bearing the common balancing responsibility. It is worth mentioning that there is neither an obligation nor a prohibition to introduce balancing groups stemming from the BAL NC.

3. Balancing tools

Article 6 of the BAL NC provides an exhaustive list of balancing actions to be undertaken by the TSO, namely to:

1. purchase and sale of short term standardized products on a trading platform and/or
2. use of balancing services.

According to the BAL NC provisions, a **trading platform** is an electronic platform where the transmission system operator trades for the purpose of undertaking balancing actions and other trading participants may also post and accept gas bids/offers to meet short term fluctuations in gas demand/supply.¹⁷ A trading platform must be an ordinary gas exchange (commodity exchange) that should function following the BAL NC requirements,¹⁸ including tradeable short term standardized products.

A **balancing platform** can be established as an interim measure,¹⁹ which will serve as a trading platform for the purpose of transmission system operator balancing. Different from a trading platform, on a balancing platform the transmission system operator is a trading participant to all trades.²⁰

In case the established trading platform or balancing platform do not provide sufficient liquidity for trade with short term standardized products, **balancing services** can be provided to the transmission system operator via a contract for gas required to meet short term fluctuations in gas demand/supply.²¹ The requirements for balancing services are defined in Article 8 of the BAL NC; if interim measures are applied, balancing services may be used as an alternative to a balancing platform.²²

The BAL NC also foresees the possibility for the TSO to provide network users with **linepack flexibility services** after the approval of the related terms and conditions by the national regulatory authority.²³ The definition of linepack is provided by Article 2(15) of Gas Directive 2009/73/EC²⁴ and means storage of gas by compression in gas transmission and distribution systems but excluding facilities reserved for transmission system operators carrying out their functions. Article 43 of the BAL NC stipulates that the terms and conditions applicable to a linepack flexibility service shall be consistent with the responsibility of a network user to balance its inputs and off-takes over the gas day. The reduction of within-day obligations should be prioritized over the provision of a linepack flexibility service.

¹⁷ Cf Article 3(4) BAL NC.

¹⁸ See the criteria of Article 10(1) BAL NC.

¹⁹ Cf Article 47 BAL NC.

²⁰ Cf Article 3(6) BAL NC.

²¹ Cf Article 8(1) BAL NC.

²² Cf Article 48 BAL NC.

²³ Cf Article 43 *et seq* BAL NC.

²⁴ Directive 2009/73/EC concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC Adapted and adopted for the Contracting Parties by Decision 2011/02/MC-EnC of the Ministerial Council.

Table 2 provides an overview of balancing mechanism tools that can be used by the TSOs and network users in the analyzed countries.

Table 2 Balancing mechanism tools

Country	Balancing mechanism tools available to	
	TSO	Network users
Poland	Trading platform	Trading platform
	Balancing services	
	Balancing platform in specific cases (until 1 st of April 2019)	
Croatia	Trading platform	Trading platform
	Balancing services	Bilateral trade between network users not via the trading platform
		Storages
Serbia	Balancing services are foreseen by the legislation but not applied in practice	Bilateral trade between network users not via a trading platform
	Gas purchase contract: the TSO uses it to buy or sell gas depending on positive or negative imbalance occurred in the transmission system	
Bosnia and Herzegovina	Gas purchase contract concluded by the TSO	Bilateral trade between network users not via a trading platform
North Macedonia	Balancing services	Bilateral trade between network users not via a trading platform
Georgia	Gas purchase contract	Bilateral trade between network users not via a trading platform
		Linepack (possibility for network users to store gas in the transmission system)
Ukraine	Trading platform, balancing services (daily balancing)	Trading platform (daily balancing)
	Gas purchase contract concluded by the TSO for negative imbalances (monthly balancing – until March 2019)	Bilateral trade between network users not via a trading platform (monthly and daily balancing)
	Storages for positive imbalances (monthly balancing – until March 2019)	Storages

Trading platform, balancing platform and balancing services

A trading platform is only in place in **Poland and Croatia**.

- In **Poland** the trading platform is a part of the commodity exchange, where both electricity and gas products are traded. The transmission system operator of Poland used a balancing platform before the establishment of the trading platform. The balancing platform was set up as an interim measure in all three balancing zones. The creation of the balancing platform aimed to help the transmission system operator to buy and sell gas for balancing purposes as long as the trading platform was not active. However, in practice the balancing platform was not used due to the lack of shippers registered on the platform. Until 1st April 2019 the balancing platform could be used when the transmission system operator needed to buy locational short term standardized products for the purpose of gas delivery on the East border of the country in the high methane balancing zone. Additionally, in a very small part of Poland's transmission system, i.e. on the border with Czech Republic, the transmission system operator uses balancing services. It is worth mentioning that in Poland the basis for establishment of balancing services was based on Article 8(1) of BAL NC, not Article 48.²⁵ The balancing services were initiated in 2015.
- In **Croatia**, balancing services were not used by the transmission system operator due to sufficient liquidity of trade with short term standardized products. Nevertheless, balancing services were procured in a market-based manner through a transparent public tender by the transmission system operator with the purpose to keep the transmission network within its operational limits in case of absence of short term standardized products traded on the trading platform. The service is contracted since 1 April 2017 on yearly basis.

There are also some gas exchanges in **Ukraine** – they are however of low liquidity and not used by the transmission system operator for physical balancing and are also not compliant with the BAL NC requirements. Discussions on the establishment of a new – compliant with the BAL NC criteria – gas exchange in Ukraine are ongoing.²⁶

The transmission system operators in **Ukraine, Serbia, Georgia, North Macedonia and Bosnia and Herzegovina** do not use any of the tools defined in the BAL NC, except linepack services in Georgia (for details see later). The daily balancing regime which was implemented in Ukraine in March 2019 newly introduced balancing services that can be provided to the TSO and trading platforms that can serve for balancing purposes; as outlined above such trading platforms are however not yet used in

²⁵ Article 8 entitles the TSO to procure balancing services in case short- term standardized products will not or are not likely to provide the response necessary to keep the transmission network within its operational limits or in the absence of liquidity of trade in short term standardized products. Article 48 permits the use of balancing services subject to the approval by the national regulatory authority in cases where the transmission system operator can demonstrate that as a result of insufficient interconnection capacity between balancing zones a balancing platform cannot increase the liquidity of the short term wholesale gas market.

²⁶ <https://energy-community.org/news/Energy-Community-News/2018/011/21.html>.

Ukraine. In Serbia, balancing services are envisaged by the network code, but are not implemented in praxis.²⁷

Selling and buying of balancing gas

In **Georgia, Ukraine, North Macedonia, Serbia, Bosnia and Herzegovina**, transmission system operators procure gas for physical balancing purposes along with the gas required for covering transmission losses. Only in Ukraine this is done via a tender procedure/auction. In Serbia, a tender procedure for gas procurement is foreseen in the legislative and regulatory framework but not applied in praxis.

All balancing mechanism tools foreseen by the BAL NC assist the transmission system operator not only in buying, but also in selling gas to the market. The balancing tool used in **Ukraine** until March 2019 differed from the main principles established by the BAL NC. For instance, the transmission system operator of Ukraine had the right to book a certain amount of storage capacity necessary for physical balancing of the transmission system. Until March 2019 the transmission system operator also required from shippers that were in positive imbalance, to inject the relevant gas volumes into storages and the related volumes were assigned to the relevant shipper in the storage. In other words, the transmission system operator was not entitled to sell the excessive gas until March 2019.

Similarly in **Georgia**, the transmission system operator has to store excessive gas in the transmission system first for at least three days:²⁸ only if it is not possible to store gas, the transmission system operator is obliged to take necessary measures for the benefit of the shipper. Hence, where a positive imbalance is in place, the relevant gas volumes will be stored, not sold by the transmission system operator: a shipper does not lose its gas but also does not receive a financial compensation. With the new balancing rules expected to enter into force in **Georgia** in 2020 the transmission system operator will sell gas to network users in case of negative imbalance and buy excessive gas from network users with positive imbalance.

Such kind of balancing tools do not incentivize trade of gas surplus occurred in the system and do not foster development of gas market liquidity. In Ukraine, previously existing implementation obstacles for the implementation of key characteristics of the BAL NC have been eliminated recently. Namely, special amendments to the national public procurement law were necessary to exclude the TSO as state-owned company from the obligation to procure any goods/services via a tender procedure, while BAL NC provides for the right for the TSO to procure gas via a trading/balancing platform. Since the implementation of the daily balancing mechanism in March 2019, positive imbalances are performed by the transmission system operator in accordance with the BAL NC requirements.

²⁷ Cf chapter 1.

²⁸ Stored as linepack – see later.

In **Croatia** network users can balance their portfolios by procuring short-term standardized products at the trading platform and by buying/selling gas from/to other network users bilaterally (i.e. not via a trading platform). In **Poland** network users have access to the trading platform where short term standardized products are traded. In both countries, short term standardized products are available seven days a week; in Poland only title products are traded, in Croatia both title and locational products. The trading platforms in both countries provide anonymous trading at least until a transaction is concluded as well as a detailed overview of current bids and offers for all trading participants.

In **Serbia, Georgia, Ukraine, North Macedonia and in Bosnia and Herzegovina** network users have the possibility to balance their portfolios only by buying/selling gas from/to other network users (suppliers/traders) bilaterally (i.e. not via a trading platform), storages can be additionally used in Ukraine and Croatia. In Ukraine, network users also have possibilities to participate at the existing gas exchanges, but they are not used for balancing purposes due to the lack of short term liquidity and absence of short term standardized products and are also not compliant with the requirements of the BAL NC.

Linepack services

Linepack services are provided only in **Georgia**,²⁹ where the TSO has the obligation to store gas in the system for three days without charging a shipper. If gas is stored for more than three days, the transmission system operator can request compensation. If it is not possible to store gas, the TSO has to take all necessary measures for the benefit of the shipper. It is worth mentioning that conditions for linepack services in Georgia are not consistent with all the BAL NC principles due to the application of a monthly balancing regime.

²⁹ This practice should be changed in 2020. However existing network code describes how the linepack can be used.

4. Nomination and re-nomination procedure

Chapter IV of the BAL NC is dedicated to nomination/re-nomination requirements, including nomination units, nomination cycle and information to be included into nomination/re-nomination.

Nominations (re-nominations) are required to be submitted at all entry/exit points in **all analyzed countries**, except **Poland** where nominations (re-nominations) at entry/exit points to distribution systems are not required. It is worth mentioning that Article 18 of the BAL NC requires nominations and re-nominations only at interconnection points.³⁰

Table 3 provides an overview of the nomination units and types of nomination applied in the analyzed countries.

Table 3 Types of nomination and units

Country	Types of nomination	Nomination unit
Poland	hourly	kWh/h
Croatia	hourly	kWh/h
Serbia	Weekly, daily	m3/day
Bosnia and Herzegovina	Quarterly, monthly, weekly, daily	Sm3
North Macedonia	Quarterly, monthly, weekly, daily	Nm3
Ukraine	daily (since March 2019) Monthly but including quantities per each day (until March 2019)	m3/day

Daily (kWh/d) and hourly (kWh/h) nominations are allowed by the BAL NC.³¹ Also, transmission system operators may require network users to provide further information on nominations and re-nominations in addition to the requirements set out

³⁰ Article 3(2) of Regulation 2017/459 establishing a network code on capacity allocation mechanisms in gas transmission systems defines an 'interconnection point' as 'a physical or virtual point connecting adjacent entry-exit systems or connecting an entry-exit system with an interconnector, in so far as these points are subject to booking procedures by network users'. The definitions of Article 3 of Regulation 2017/459 are applicable for the BAL NC pursuant to its Article 3.

³¹ Cf Article 12 BAL NC.

in BAL NC, including an accurate and detailed forecast of the expected inputs and off-takes.³²

Although there is a daily balancing mechanism in **Poland and Croatia**, hourly nominations are to be submitted by the network users. Until March 2019 gas quantities were nominated once per month in **Ukraine** including an indication of the quantities that were to be transported each day; these daily quantities could be re-nominated during the month on a daily basis. Since March 2019 daily nominations are applied in Ukraine. There are weekly and daily nominations in **Serbia** and daily, weekly, monthly and quarterly nominations in **North Macedonia** and in **Bosnia and Herzegovina**. This means that, unlike in Poland and Croatia, the nomination (re-nomination) cycle and units in the Energy Community **Contracting Parties** do not correspond to the BAL NC requirements. The exception is Ukraine, where since 1st March 2019 the nomination procedure is held in accordance with the BAL NC provisions.

Also, nomination units used in the Contracting Parties are not in line with the BAL NC, which correlates with the fact that network users are still invoices in m3.

In all analyzed countries, nominations cannot be accepted by the transmission system operator if they exceed the level of contracted capacity. In **North Macedonia, Bosnia and Herzegovina and Serbia**, there are also some other restrictions for submitting nominations/re-nominations which are related to transmission system flexibility:

- in Bosnia and Herzegovina, the TSO accepts daily re-nominations if the change of quantity is not bigger than the maximal daily quantities divided by 24;
- in Serbia, the transmission system operator may reject nomination if their hourly value is higher than 1/16 of the daily nomination value;
- in North Macedonia, monthly nominated quantities cannot be bigger than the quantities indicated in the quarterly nomination.

In **Georgia**, at the beginning of each month network users provide information to the transmission system operator on the projected quantity of gas to be transported to/from a specific point(s) for the upcoming month. Network users are obliged to inform the TSO on projected increase or reduction of the declared/nominated natural gas quantity two days prior to the expected change. The new Natural Gas Network Code, adopted in 2018, introduced the concepts of nomination and re-nominations. Consequently in 2020, network users will be obliged to submit nominations and re-nominations to the transmission system operator in accordance with this Code.

Article 13 of the BAL NC lists the **minimal information requirements** to be submitted for nominations/re-nominations at interconnection points. Table 4 shows which information is obligatory for network users in the analyzed countries as required by the BAL NC.

³² Cf Article 12 BAL NC.

Table 4 Information required to be included in the nominations/re-nominations [Y- yes, N- no]

	Poland	Croatia	Serbia	Bosnia and Herzegovina	North Macedonia	Ukraine
Interconnection point	Y	Y	Y	Y	Y	Y
Direction of the gas flow	Y	Y	Y	Y	Y	Y
A network user/balancing portfolio	Y	Y	Y	Y	N	Y
A counterparty of a network user/balancing portfolio	Y	Y	N	Y	N	Y
A gas day	Y	Y	Y	N	Y	Y
The gas quantity requested to be transported	Y	Y	Y	Y	Y	Y

Article 14 of the BAL NC stipulates that in the absence of a valid nomination sent by the network user before the nomination deadline, the respective transmission system operator shall apply the default nomination rule agreed between these transmission operators. The default rule in **Poland, Croatia and Ukraine** is that in case of absence of nominations until the deadline, the nomination will be set at 0 level. In Ukraine only nominations on monthly basis and daily re-nominations were allowed as long as the monthly balancing regime was in place; since the introduction of a daily balancing mechanism in March 2019 also nominations on daily basis are permitted. In **Serbia, Bosnia and Herzegovina and North Macedonia** in case of a lack of daily nomination, the daily value is calculated from weekly nominations by the transmission system operator. In Serbia, if there are neither daily nor weekly nominations, daily nominations are considered zero.

5. Imbalance quantity, imbalance charges, tolerance levels

Calculation of imbalance quantities

Article 21 of the BAL NC stipulates that the daily imbalance quantity for each network user's balancing portfolio for each gas day is calculated as <inputs minus off-takes> by a network user during this gas day. Furthermore there are some cases when daily imbalance quantities should be adapted, including when a linepack flexibility service is offered or in case a network user provides gas to the transmission system to cover losses, metering errors and/or fuel gas. In **all analyzed countries** the imbalance quantity is calculated in line with the BAL NC.

Information requirements

In order to enable network users to take timely corrective actions, Article 21(5) of the BAL NC envisages the requirement for TSOs to provide network users with their initial and their final daily imbalance quantities in accordance with Article 37.

In **Serbia** – although not in compliance with the requirements of Article 37 of the BAL NC –, **Poland** and **Croatia** both initial and final allocations are provided to network users. In all **other countries** only final allocations are provided to network users. In **Ukraine**, in the monthly balancing regime in place until March 2019 only final allocations were made available by the TSO; initial allocations became available to network users on a special information platform after introduction of the daily balancing system. In Poland, related information is published on a special platform named *Information Exchange System*: information is available to all users and, additionally, information dedicated to specific network users is provided.

Table 5 provides an overview of the definition of the applicable price for the purpose of imbalance calculation, the applicable price adjustment and the tolerance levels in the analyzed countries.

Table 5 Imbalance charges and tolerance levels

Country	How is an applicable price defined?	What is the level of small adjustment applied for an applicable price calculation?	Tolerance level
Croatia	Based on the marginal sell and buy price (in the meaning of Article 22 of the BAL NC).	If the weighted average price is used for the applicable price calculation, the adjustment will be 10%	0%

Country	How is an applicable price defined?	What is the level of small adjustment applied for an applicable price calculation?	Tolerance level
Poland	Based on the marginal sell and buy price (in the meaning of Article 22 of the BAL NC).	If the weighted average price is used for the applicable price calculation, the adjustment will be 10%	0%
Ukraine	<p>In the daily balancing regime:</p> <ul style="list-style-type: none"> - based on the marginal sell and buy price (in the meaning of Article 22 of the BAL NC); - based on TSO's costs incurred during the process of gas procurement for physical balancing purposes plus/minus the adjustment (as an interim measure until trading platform will be applied in balancing); - based on the gas price set by the Resolution of the Cabinet of Ministers of Ukraine on Public Service Obligation for network users which supply/trade the gas in regulated market. <p>In the monthly balancing regime until March 2019</p> <ul style="list-style-type: none"> - For negative imbalance: the TSO's costs incurred during the process of gas procurement for physical balancing purposes plus other costs needed for transmission and storage of this gas divided by gas volume procured plus the adjustment - Positive imbalance not charged 	<p>in the daily balancing regime: if the weighted average price is used for the applicable price calculation: 10%</p> <p>in the monthly balancing regime until March 2019: 20% for negative imbalance, NAP for positive imbalance</p>	<p>in the daily balancing regime: 10%</p> <p>in the monthly balancing regime until March 2019: 5% for negative imbalance; NAP for positive imbalance</p>
Serbia	Determined as actual weighted average price of gas on stocks plus or minus the adjustment	<p>In case a monthly imbalance is < 10% (2nd level of imbalance) the adjustment is 5% (summer period) or 10% (winter period) and for the third level of imbalance: it is 20% in summer period or 30% in winter period. In case a monthly imbalance ≥ 10%, then for the second level of imbalance: it is 20% in summer period or 30% in winter period, and for the third level of imbalance: it is 30% in summer period or 50% in winter period.</p>	0.2% on entries and 2% (winter)/4% (summer) on exits

Country	How is an applicable price defined?	What is the level of small adjustment applied for an applicable price calculation?	Tolerance level
Bosnia and Herzegovina	Administered (regulated) price since March 2018 plus or minus the adjustment	If an imbalance is > 2% < 10%, the adjustment is 10% . If an imbalance is > 10%, the adjustment is 20%	2%

Imbalance charges and applicable price

One of the requirements of Article 23 of the BAL NC is that daily imbalance charges for each network user should be calculated by multiplying a network user's daily imbalance quantity with the applicable price determined in accordance with Article 22 of the BAL NC. The applicable price is defined as follows:

- marginal sell price for positive imbalance, which is the lower of:
 - o the lowest price of any sales of title products in which the TSO is involved in respect of the gas day; or
 - o the weighted average price of gas in respect of that gas day minus small adjustment.
- marginal buy price for negative imbalance, which is the lower of:
 - o the highest price of any purchases of title products in which the TSO is involved in respect of the gas day; or
 - o the weighted average price of gas in respect of that gas, plus a small adjustment.

It is worth mentioning that a "small adjustment" should not exceed 10% unless another level is justified by the transmission system operator to the national regulatory authority.³³ Additionally, the BAL NC allows for interim measures that allow the use of a proxy for a market price or a price derived from balancing platform trades for the calculation of daily imbalance charges.³⁴ Hence, in case there is not sufficient liquidity of the short term wholesale gas market, an administered price can be applied for the purpose of imbalance charge calculation.

In **Croatia**, the applicable price is defined for the purpose of imbalance charge calculation in accordance with Article 22 of the BAL NC: every day the gas market operator calculates the lowest/highest price of any sales of title products in which the transmission system operator is involved related to the gas day, the weighted average price of gas for that gas volumes, plus/minus 10% (if the parameters are available), chooses the lowest of each of the two parameters and publishes the marginal sell and

³³ Cf Article 22(7) BAL NC.

³⁴ Cf Article 49 BAL NC.

buy price. In case the parameters for calculation of the marginal sell/buy prices are not available, the applicable price is based on the marginal sell/buy price taken from the last gas day in which the transactions on the trading platform were concluded (it is equal to the last published applicable prices).

In **Poland** calculation of the applicable price is also based on the marginal sell and buy price in the meaning of Article 22 of the BAL NC.

In **Georgia**, network users buy gas to balance their position through bilateral contracts and should inform the transmission system operator of the sources and quantity of the gas for balancing their positions. Consequently all issues related to imbalance charge calculations are negotiated and laid down in supply contracts. With the new rules applicable as of 2020 the transmission system operator will have the right to implement balancing measures and receive compensation (balancing/imbalance fees) from network users.

In **Ukraine** until March 2019 a positive imbalance was not charged at all: in case of positive imbalances, the transmission system operator injected the gas into the storages and assigned it to the relevant shipper in the storage. For negative imbalances the applicable price was defined as the transmission system operator's costs incurred during the process of gas procurement for physical balancing purposes plus other costs needed for transmission and storage of this gas divided by gas volume procured plus an adjustment as indicated in table 5. The new daily balancing regime that is applied since March 2019 foresees the calculation of an applicable price in accordance with Article 22 of the BAL NC requirements. However, due to the fact that a trading platform cannot be used in Ukraine in the balancing process for now, the daily balancing regime provides as an interim measure that the imbalance charge can be defined based on the TSO's costs incurred during the process of gas procurement for physical balancing purposes plus/minus adjustments. Also, since a part of the market of Ukraine still functions under regulated gas prices,³⁵ imbalance charges for network users subject to price regulation is defined at the level of the price set by the Resolution of the Cabinet of Ministers of Ukraine on Public Service Obligation.

In **Serbia**, the applicable price is defined similar to the monthly balancing regime applied in Ukraine until March 2019: it is calculated based on the actual weighted average price of gas on stocks adding or deducting the adjustment.

In **Bosnia and Herzegovina** the applicable price is administered (regulated) since March 2018 adding or extracting the adjustment.

No imbalance charge is applied in **North Macedonia**.

In **Ukraine**, the average imbalance charge applied in 2017 was 26.88 EUR/MWh (for negative imbalance, for positive – not applied), in **Poland** – 18.01 EUR/MWh for positive imbalance and 19.22 EUR/MWh for negative, in **Croatia** – 20.7 EUR/MWh (in

³⁵ Gas prices are regulated by the Cabinet of Ministers of Ukraine.

average for both positive and negative imbalances). Other countries did not provide related information.

Level of adjustments

The level of adjustments that is added (in case of negative imbalance) or deducted (in case of positive imbalance) to/from the applicable price varies significantly among the analyzed countries. The lowest and the highest level applies in **Serbia** – 5% and 50% respectively, depending on the imbalance quantity and season (summer/winter). 10% are applied in **Croatia** and **Poland**.³⁶ In **Bosnia and Herzegovina** the applicable level is 10% or 20%, depending on the imbalance quantity. In **Ukraine** it is 20% in the monthly balancing regime and now reaches 10% in the new daily balancing.

Marginal buy and sell price

Article 10(5) of the BAL NC specifies that the evolution of the marginal buy and sell price should be published by the trading platform operator or by the transmission system operator. Table 6 lists the links to relevant publications in the displayed countries. In case of Ukraine, both reference to the evolution of the applicable price³⁷ for each month – as applied in the monthly balancing regime – and reference to the marginal buy/sell price as now applied in the daily balancing regime are shown in the table. In Serbia the transmission system operator has published a neutral gas price which is the reference for imbalance prices calculation since 2013.³⁸

Table 6 Publication of marginal/reference prices

Country	Link to publication
Croatia	http://www.hrote.hr/balancing-energy-191
Poland	http://en.gaz-system.pl/strefa-klienta/taryfa/bilansowanie/ceny-do-rozliczenia-niezbilansowania/ https://gaz.tge.pl/en/rdn/gas/index/index/
Serbia	http://www.srbijagas.com/wp-content/uploads/2019/01/Neutralna-cena-gasa-januar-2019.pdf
Ukraine ³⁹	http://utg.ua/utg/business-info/price-tariffs.html

Tolerances

The interim measures of the BAL NC also allow applying a tolerance, which means the maximum quantity of gas to be bought or sold by each network user at a weighted

³⁶ If the weighted average price is used for the applicable price calculation.

³⁷ Without taking into account the adjustment of 20% which is applied in case the quantity of imbalance is more than 5%.

³⁸ “Neutrality” of the gas price means that the TSO does not gain benefits or losses from it.

³⁹ The evolution of applicable price (without taking into account the adjustment of 20% which is applied in case the quantity of imbalance is more than 5%) for each month is given in the table. The marginal buy/sell price is not used for the purpose of an applicable price calculation.

average price. If there is a remaining quantity of gas for a network user's daily imbalance quantity exceeding the tolerance level, this shall be sold or bought at a marginal sell/buy price as described above. Article 50 of the BAL NC includes conditions under which tolerances can be applied, namely where network users do not have access:

- to a short term wholesale gas market that has sufficient liquidity;
 - to gas required to meet short term fluctuations in gas demand or supply; or
- to sufficient information regarding their inputs and off-takes.

Tolerances are not implemented only in **Croatia**. In **Georgia**, it the tolerance level so far was not regulated by legislation but was negotiated and defined in the supply contract of the network user. According to the new Network Code which should be applied as of 2020 the tolerance level is 10%. The lowest tolerance level applies in **Bosnia and Herzegovina** (2%) and, until 1st April 2019 for the **Polish** high methane balancing zone; it is now set at 0%. A 5% level applied in **Ukraine** for negative imbalances in the monthly balancing and is now set at 10% in the new daily balancing. A level of 10% is applied also in **North Macedonia**. In **Serbia** the following rules apply:

- for entry points the tolerance level is calculated as the system user's input quantities multiplied by 0.2%;
- for exit point it is calculated as system user's exit quantities multiplied by 4% in the summer period (April – September) and multiplied by 2% in winter period (October – March);

It has to be noticed that the conditions for application of tolerances as defined by Article 50 of the BAL NC are met in all countries where tolerances are applied. For instance, there is a lack of short term wholesale gas market liquidity in some balancing zones in Poland,⁴⁰ or network users did not have access to sufficient information regarding their inputs and off-takes in Ukraine (until March 2019), Serbia and North Macedonia..

⁴⁰ Namely the low methane- and the TGPS balancing zones even though their role in the Polish gas market is rather marginal; liquidity in high methane balancing zone is considered good.

6. Neutrality arrangements and financial security safeguards

Chapter VII of the BAL NC establishes principles and rules for neutrality of transmission system operators with respect to payment or receipt of balancing related charges. The principle of TSO neutrality is established in **Croatia, Poland** and **Serbia**. In **Ukraine**, it is enshrined in legislation and shall be applied in 2020. In December 2018 a new neutrality mechanism was implemented in **Poland**.⁴¹

Financial security safeguards of transmission system operators are provided in all analyzed markets, except **Bosnia and Herzegovina** and **Georgia**. In 2020, the transmission system operator of **Georgia** will have the right to request safeguard measures (guarantee or advance payment) if contract conditions are violated. In **North Macedonia**, an advance payment is required every 15 days. Network users in **Poland** can provide cash deposits, bank or insurance guarantees, bill of exchange or ratings as a financial security. In **Serbia** and **Croatia**, bank guarantees or deposits are required, while in **Ukraine** the transmission system operator requests a bank guarantee or an advance payment as safeguard.

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http://en.gaz-system.pl/fileadmin/pliki/taryfa/en/Mechanism_ensuring_cost_neutrality_of_balancing_measures.pdf

CONCLUSIONS

The regulatory authorities of the analyzed gas markets identified the following reform needs for implementation of the BAL NC in their jurisdictions:

- **Croatia:** no implementation obstacles were identified.
- **Poland:** lack of liquidity in two of three balancing areas, namely the low methane- and the TGPS balancing zones even though their role in the Polish gas market is rather marginal;⁴² absence of interconnection points on the borders with other countries in the low methane balancing zone which is located midland of the country; low level of accurate information for shippers.
- **Serbia:** lack of implementation of balancing rules in praxis - TSOs started providing information on balancing status only in 2017, however without applying balancing charges.
- **Georgia:** isolation of the market, non-compliance with the Energy Community *acquis communautaire*,⁴³ low level of market development.
- **Ukraine:** previously existing implementation obstacles have been eliminated recently. Namely, special amendments to the national public procurement law were necessary to exclude the TSO as state-owned company from the obligation to procure any goods/services via a tender procedure, while BAL NC provides for the right for the TSO to procure gas via a trading/balancing platform. Also, a special IT system for the TSO to process nominations and provide allocations has been finalized, however with certain improvements still to be done.

The current state of compliance with the requirements of the BAL NC in the Contracting Parties is low. In general, there is a lack of practice of regulating balancing processes in gas transmission systems and in Georgia and Moldova balancing issues are even the subject of supply contracts; in Georgia this situation is supposed to change with the application of the new Network Code in 2020. Ukraine, on the other hand, made big efforts to switch to a daily balancing mechanism that follows the BAL NC requirements. According to NEURC, all secondary legislation necessary for implementation of the BAL NC has been adopted by the regulator.

It is worth mentioning, that a daily balancing regime cannot be reasonably implemented without providing the transmission system operator with data on non-daily metered off-takes and giving the system users information on their imbalance status in a timely and user-friendly manner. Meeting this requirements via the establishment of a special IT platform has relevant financial impact that Contracting Parties may be reluctant to address where gas market liquidity is low and/or gas infrastructure is not in place. The same argument may be a barrier for the establishment of trading platforms. Consequently, the implementation of interim measures shall be considered at least in

⁴² The liquidity in high methane balancing zone has been identified as good.

⁴³ Georgia became Contracting Party of the Energy Community in July 2017 and the process of aligning national legislation with the Third Package is still ongoing.



the first stage of BAL NC implementation. The experience of EU Member States in using the balancing platforms will be useful in that respect. Without interim measures, implementation of the BAL NC realistically cannot be achieved in less than three years. Finally, the responsibility of regulators to pro-actively design their gas markets and make use of their enforcement powers to foster liquidity, transparency and ensure compliance with the legislative and regulatory regime has to be highlighted.