



**Energy and Water Regulatory Commission (EWRC)
Bulgaria**

Annual Report to the European Commission

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LIST OF ABBREVIATIONS

ACER	Agency for the Cooperation of Energy Regulators
ANRE	Romanian energy regulatory authority
BOTAS	Turkish gas transmission operator
CCP	Commission for Consumer Protection
CCR	Capacity Calculation Regions
CDP	Commercial dispatching platform
CEER	Council of European Energy Regulators
CEF	Connecting Europe Facility
CESEC	Central and South Eastern Europe Gas Connectivity
CPC	Competition Protection Commission
CR 3	Concentration ratio – the sum of the market shares of the three biggest market participants
DAM	Day Ahead Market
DEPA	Greek energy company
DESFA	Greek gas transmission operator
EA	Energy Act
EMR	Electricity Market Rules
ENTSOE	European Network of Transmission System operators - electricity
ENTSOG	European Network of Transmission System operators – gas
EPS	Electric power system
ESO EAD	Electricity system operator EAD
ETN	Electricity transmission network
EU	European union
EWRC	Energy and Water Regulatory Commission
GDN	Gas distribution network
GMS	Gas metering station
GRIPs	Gas regional investment plans
GRMB	Gas regulatory metering board
HHI	Herfindahl-Hirschman Index, sum of the squares of the market shares of the participants in the relevant market
HPP	Hydroelectric power plant
IBEX EAD	Independent Bulgarian Energy Exchange EAD
IBS	Gas interconnection Bulgaria – Serbia
IGB	Gas interconnection Greece – Bulgaria
ITB	Gas interconnection Turkey – Bulgaria
ITO	Independent Transmission Operator
MPNGAT	Methodology on pricing of natural gas access and transit in gas transmission networks owned by Bulgartransgaz EAD
NC TAR	Network code on harmonized tariff structures for transmission of gas
NDC	National Dispatching Centre
NEK EAD	National Electricity Company EAD
OEPR	Ordinance №1/2013 on electricity price regulation
ONGPR	Ordinance №2/2013 on natural gas price regulation
OP	Operative Programme
PCI	Project of common interest

PP	Power plant
PvPP	Photovoltaic power plant
RAE	Greek energy regulatory authority
RBP	Reginal booking platform
RES	Renewable energy sources
SLP	Standardized Load Profiles
TANAP	Trans-Anatolian natural gas pipeline
TAP	Trans-Adriatic pipeline
TSO	Transmission System Operator
UGS Chiren	Underground gas storage
VTP	Virtual trading point
WPP	Wind power plant

1. FOREWORD

The present paper represents a national report elaborated by the Energy and Water Regulatory Commission (EWRC, the Commission) and submitted to the Agency for Cooperation of the Energy Regulators and the European Commission in pursuance of the reporting obligations under art.37, para 1b, item d of Directive 2009/72/EC and art.41, para 1b, item d of Directive 2009/73/EC. The structure of the Report follows the one suggested by CEER.

The year 2016 marked continuation of the electricity market liberalization. On 19 January 2016 the real operation of the day-ahead market was launched, administered by Independent Bulgarian Energy Exchange EAD (IBEX EAD).

The increasing amounts of traded electricity shall lead to market-based, transparent and objective prices as a result of demand and supply. EWRC adopted the regulation required, enabling small business consumers to negotiate freely supplies and switch energy suppliers. By the adopted *Instruction on switching suppliers* and the introduction of standardized load profiles, since April 2016 households may switch their supplier without being charged and, if they wish, they can go back in the regulated market. The energy regulator controls the traders' activity in order to avoid abuses and irregularities in their work with consumers.

To that end, EWRC decisions in 2016 are compatible with the European electricity market target model and that represent an important step towards achieving the European integrated energy market. This will bring together the prices of the various markets and make the use of interconnectors more efficient, bringing Bulgaria closer to a sustainable and competitive internal energy market - a market that will gain momentum in the coming year and the years afterwards.

A considerable progress was achieved in 2016 in the development of the gas interconnections with neighbouring countries, aiming at gas supplies diversification. The gas interconnection with Romania was accomplished, the IGB project with Greece was further developed and a memorandum was signed for the gas interconnection with Serbia. The Bulgarian regulator introduced some important changes in the regulations directed towards gas market liberalization. The *Rules for access to the gas transmission and/or gas distribution networks and storage facilities* have been amended and some changes in *Natural Gas Market Rules* have been adopted. EWRC adopted amendment of the *Methodology on pricing of natural gas access and transit in gas transmission networks owned by Bulgartransgaz EAD*, thus introducing the European entry-exit model with different price zones. *Rules on natural gas market balancing* and *Daily imbalance charge calculation methodology* have been approved. Interconnection agreement between the gas transmission operators of Bulgaria and Greece has been signed, with the active participation of EWRC and the Greek regulator RAE and a Market test for the reserving of capacity has been held for the gas interconnection IGB Komotini – Stara Zagora.

EWRC took an active participation in the processes of establishing the conditions required for the achievement of competitiveness and liberalization of the Bulgarian gas market as part of the EU market and took some important key steps towards the achievement of those objectives and exercising its competencies it created a unified regulatory framework.

In 2017 EWRC shall continue the reforms in the energy sector related to the Regulator itself and with the fields subject to regulation. We are convinced that our regulatory efforts shall result in considerable benefits for the end consumers and the market participants.

Assoc. Prof. Ivan N. Ivanov, PhD
EWRC Chairman

2. MAIN DEVELOPMENTS IN THE GAS AND ELECTRICITY MARKETS

2.1. Main developments in the electricity market

In 2016 the first successful real exchange session at the Independent Bulgarian Energy Exchange EAD was held with physical supply date 20 Jan 2016. In line with art.4, para.1, item 1 of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management, by Decision № HO-1 of 27 Jan 2016, EWRC nominated IBEX EAD as „nominated electricity market operator“ for the territory of Bulgaria for a period of four years. EWRC complied with the cited above Regulation requirement, which ensures the smooth functioning and implementation of the single day-ahead and/or intraday coupling.

Since 1 April 2016 the application of standardized load profiles (SLP) has been enforced. Thus household and small non-household customers, who are not legally obliged to have hourly metering of their consumed energy, are able to participate in the free market with freely negotiated prices. With the special *Instruction on the switching terms and conditions* for the above mentioned customers, owing sites where SLP are applied, a possibility to facilitate the switching from regulated to open market was created.

To implement the requirements of Regulation (EU) № 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC, and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, EWRC adopted *Methodology and criteria for evaluating investments in electricity and gas infrastructure projects*. The Methodology regulates the rules, which EWRC should follow in order to identify and evaluate the risks of the projects of common interest that are necessary for the realization of large infrastructure corridors of great priority and the achievement of the main goals of the European Union's energy policy regarding competitiveness, sustainability and security of supplies. The Methodology shall facilitate PCI promoters in the preparation of their projects and shall ensure transparency and objectivity of their evaluation.

In 2016 the Energy and Water Regulatory Commission adopted amendment and supplement of *Ordinance № 6 of 24 Feb 2014 on connection of electricity generators and consumers to the transmission or distribution networks* (Ordinance № 6, prom.SG/31 of 4 April 2014, amend.SG/77 of 4 Oct 2016) in order to achieve predictability and clarity of the investment process regarding connection to the transmission or distribution networks. Specific and shortened deadlines have been established in the connection procedures, within which network operators shall coordinate projects, provide an opinion on the connection conditions and the draft connection agreement. The adopted amendments aim to increase the network operators' activities efficiency and the quality of the services offered by them.

2.2. Main developments in the gas market

In 2016 EWRC continued its activity directed towards the establishment of conditions for opening the natural gas market and ensuring unhindered market access for all market participants, including new entrants by establishing transparent, market-based mechanisms for natural gas supplies and transport.

EWRC took an active participation in the processes of establishing the conditions required for the achievement of competitiveness and liberalization of the Bulgarian gas market as part of the EU market and took some important key steps towards the achievement of those objectives.

During the reporting year, in pursuance of its competencies, EWRC established a unified regulatory framework and implemented the imperative rules of the European legislation related to the natural gas market liberalization and integration. With the adopted regulations, EWRC defines clear rules for natural gas market participants, which rules ought to have a positive impact on the market and contribute to the creation of competition and

increasing liquidity by ensuring the liberalization processes' development in the sector and the proper gas market functioning.

In this respect, the adopted by EWRC *Rules on natural gas market balancing* are of utmost importance (prom.SG/99 of 13 Dec 2016). They guarantee that network users shall be responsible for the balancing of their portfolios in order to minimize the need for the operator to undertake balancing activities. The same is the role of *Daily imbalance charge calculation methodology* (prom.SG/99 of 13 Dec 2016), which determines how to calculate the amount of daily imbalances and positive and negative imbalances prices, ensuring the formation of non-discriminatory charges for imbalances and creating incentives for the transmission system users in the territory of the country to efficiently balance their balance sheet portfolios.

The above regulations have been adopted in line with the EA, the *Natural Gas Market Rules*, as well as with the common balancing principles and requirements of Commission Regulation (EC) 312/2014 of 26 March 2014 establishing a Network Code on Gas Balancing of Transmission Networks, with regard to the report of Bulgartransgaz EAD on interim measures under Regulation (EC) 312/2014, approved with EWRC Decision № BM-1 of 29 Sep 2015.

EWRC adopted amendment and supplement of the *Natural Gas Market Rules* (prom.SG/59 of 4 Aug 2015, amend.SG/99 of 13 Dec 2016) given the direct implementation of Regulation (EC) 312/2014 in order to synchronize the provisions and to avoid prerequisites for procedure contradiction regarding the inner transmission network entry and exit points and the procedures on interconnection points.

In 2016 the Commission adopted amendment and supplement of the *Rules for access to the gas transmission and/or gas distribution networks and storage facilities* (prom. SG/36 of 16 April 2013, amend. and suppl.SG/103 of 27 Dec 2016), in order to comply with the requirements of Commission Regulation (EC) 984/2013 of 14 Oct 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 and repealing Regulation (EC) No 1775/2005 and to harmonize the access rules in Bulgaria with the ones applied in the rest of EU. Defining clear rules aims at ensuring that all natural gas market participants have the opportunity of transparent and non-discriminatory access to the gas transmission network through transparent and efficient capacity allocation auction procedures, creating prerequisites for flexible use of gas networks, which will lead to competition and increasing natural gas market liquidity in the country. The amendment and supplement of the *Rules for access to the gas transmission and/or gas distribution networks and storage facilities* simplify and facilitate capacity booking in the gas transmission network points for all network users in Bulgaria and other EU member-states at equal access terms. The amendment and supplement to the regulatory framework allow transmission capacity trade to be performed at a capacity booking platform that enables potential users of the transmission network to participate in allocating capacity on an electronic booking platform. In the interconnection points of the gas transmission network of Bulgartransgaz EAD and the gas transmission networks of Greece and Romania, as well as in all exit points of the national gas transmission network, the Bulgarian transmission operator has introduced a Regional booking platform, RBP under art. 27, § 1 of Regulation (EC) 984/2013. After 1 Dec 2016 onwards, the capacity nomination and allocation, both at interconnection points and inner entry and exit points, shall be performed at the Regional booking platform RBP. Using the Regional booking platform shall have a positive impact on the natural gas market, as it will simplify and facilitate capacity booking in the gas transmission network points for all network users in Bulgaria and other EU member-states at equal access terms.

In 2016 EWRC adopted amendment of *Ordinance №2/2013 on natural gas price regulation (ONGPR)*. The amendment aims at regulating some missing there important public relations in a way compliant with the EA provisions and providing balance between the interests of energy undertakings and customers, as well as equal treatment among the different types of energy companies. In this regard, the existing regulatory gap in terms of costs

compensation in public service obligation cases for more than one energy undertaking and in regulating the rules for the additional costs of the gas public provider resulting from the notification of natural gas amounts after the expiry of the contracts, to be borne by the person causing them, taking into account of the final customers' interests. In that regard, the amendment of ONGPR fulfils the goals and principles of Directive 2009/73/EC. The adopted amendments achieve clarity and completeness in terms of the manner and procedure for price approval of the services provided to the customers and related to the licensing activity under Art.30, para.1, item 16 of EA by regulating substantive and procedural norms.

In 2016 EWRC adopted amendment and supplement of *Ordinance № 4 of 5 Nov 2013 on connecting to gas transmission and distribution networks* (Ordinance № 4, prom.SG/105/6 Dec 2013, amend.SG/77 /4 Oct 2016) in order to achieve predictability and clarity in the investment process of connecting sites to the gas transmission network. Specific and shortened deadlines have been established in the connection procedures, within which the transmission operator shall coordinate projects, provide an opinion on the connection conditions and the draft connection agreement. The adopted amendments aim to increase the network operators' activities efficiency and the quality of the services offered by them.

In 2016 EWRC adopted amendment and supplement of *Methodology on pricing of natural gas access and transit in gas transmission networks owned by Bulgartransgaz EAD*, aiming at clearer regulation and optimization of prices' terms and conditions for access to and transmission of natural gas through gas transmission networks/system. These amendments seek to ensure fair pricing based on objective and transparent criteria, for the set and charged prices for the activity "natural gas transmission" to cover effectively the costs incurred by the TSO, to promote TSO's financial stability and the tariff stability of network users.

An important condition for the gas market liberalization in the country is the creation of a common regional gas market, which can be achieved by constructing and connecting the natural gas transmission infrastructures between the countries, as well as by overcoming the differences in capacity allocation and natural gas markets balancing regimes. Effective internal market opening and regional gas market development are a prerequisite for the creation of a single gas market in EU, which is in the interests of citizens and industry. Key importance in creating a regional gas market is the construction and putting into operation of the infrastructure projects included in the list of projects of common interest published by the European Commission. In this regard, in 2016 EWRC adopted all decisions required for the successful realization of infrastructure projects. Those were the decisions to approve documentation related to Market test Phases I and II for expression of interest to reserve capacity in the interconnection pipeline IGB, as well as a decision on the 2016-2025 Ten-year-network development plan of Bulgartransgaz EAD, which is the ground for drafting Gas regional investment plans (GRIPs) and the Community network development plan in EU, drafted by ENTSOG. In November 2016 gas interconnection Bulgaria – Romania (IBR) was put into operation. Gas interconnection Bulgaria – Romania could transport gas amounts mainly from Bulgaria to Romania due to pressure difference in the two gas transmission networks – pressure in Romanian gas transmission system is lower than the one in Bulgaria.

EWRC participated in a multilateral meeting organized by the Bulgarian national transmission operator aiming the overcoming of the technical unconformities between Bulgartransgaz EAD and the Greek gas transmission operator DESFA, as well as the harmonization of the regulatory frameworks of EWRC and RAE, which is to result in signing of an interconnection agreement between the two transmission system operators. The meeting was held on 7 June 2016 in Sofia, Bulgaria, with the participation of Bulgartransgaz EAD, DESFA, OOO Gazprom Export, the Greek energy company DEPA, the European Commission, EWRC and RAE. The signing of the interconnection agreement on 24 June 2016 between Bulgartransgaz EAD and the Greek gas transmission operator DESFA for the existing Kulata/Sidirokastro interconnection point, with the active support of the national regulatory authorities of Bulgaria and Greece, shall enable the implementation of the service "non-physical reverse natural gas transport" through the Kulata-Sidirokastro point in direction

Greece - Bulgaria. This creates opportunity for virtual natural gas trade. The first real deals are already in place and the natural gas quantities are delivered to customers on the territory of Bulgaria.

Interconnection agreement was concluded between the Bulgarian and Romanian gas transmission operators Bulgartransgaz EAD and Transgaz AD for the Negru Voda 1/ Kardam interconnection point, in force since 1 October 2016.

Both interconnection agreements have been signed on the grounds of Regulation 2015/703 establishing a network code on interoperability and data exchange rules.

The regulatory acts adopted by EWRC - the interconnection agreements signed by the national TSO with neighbouring TSOs, the introduction of the regional capacity booking platform and the construction of the gas interconnections with neighbouring countries create prerequisites for competition and increase the liquidity natural gas market in the country.

Actions taken by EWRC in the performance of its regulatory powers aimed at opening, proper functioning and development of a competitive, secure and sustainable internal gas market as part of the single EU gas market, by creating incentives for the development of efficient competition, ensuring a balance between the interests of energy companies and customers, equality and non-discrimination between different categories of energy companies and between customer types.

In pursuance of the requirements of Regulation 347/2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, EWRC adopted *Methodology and criteria on evaluation of investments in infrastructure projects for the transmission of electricity and natural gas*. The Methodology regulates the rules, which EWRC should follow in order to identify and evaluate the risks of the projects of common interest that are necessary for the realization of large infrastructure corridors of great priority and the achievement of the main goals of the European Union's energy policy regarding competitiveness, sustainability and security of supplies. The Methodology shall facilitate PCI promoters in the preparation of their projects and shall ensure transparency and objectivity of their evaluation.

3. ELECTRICITY MARKET

3.1. Networks regulation

3.1.1. Unbundling and TSO certification

In relation to the restructuring of electricity generation, transmission and system operation, as well as in compliance with Directive 2009/72/EC, Bulgaria has chosen the independent transmission operator model, where the transmission operator and network assets are separated into a legal entity within the vertically integrated undertaking, which carries out the generation and supply activities.

In pursuance of the requirements of Directive 2009/72/EC, after the performed unbundling procedure for Electricity System Operator EAD (ESO EAD) from Natsionalna Elektricheska Kompania EAD (NEK EAD) in 2014, ESO EAD became an owner and operator of the whole electricity transmission network in Bulgaria.

ESO EAD is a certified independent transmission operator certified by EWRC Decision in 2015, thus implementing the requirements of art.10 and art.11 of Directive 2009/72/EC and art.3 of Regulation (EU) 714/2009¹.

¹ Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003

Electricity distribution is carried out by electricity networks operators in separate territories – CEZ Distribution Bulgaria AD, Energo-Pro Grid AD, EVN Bulgaria Distribution EAD and ERP Zlatni Piasaci AD.

CEZ Bulgaria AD was established in mid-2005 to perform management and supporting activities for all CEZ Group companies in Bulgaria. The company is 100% owned by CEZ a.s. Czech Republic.

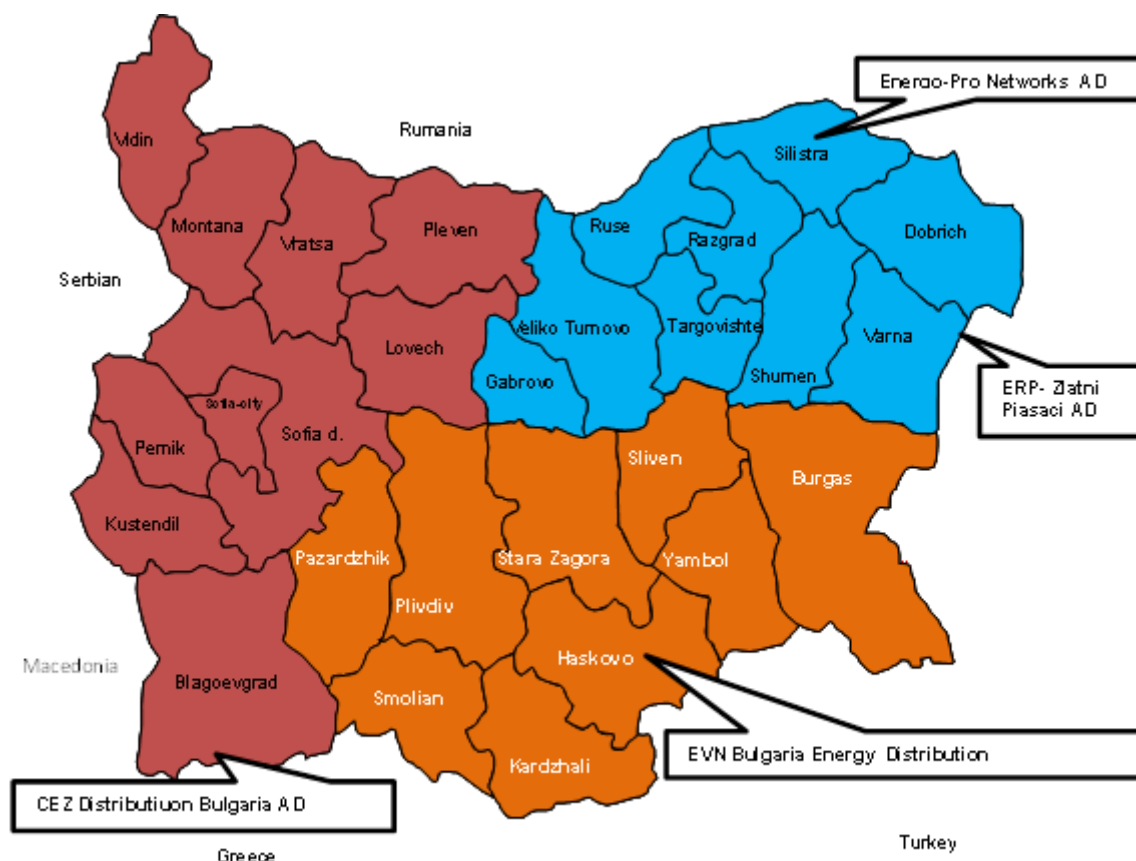
CEZ Electro Bulgaria AD supplies with electricity more than 2 million end customers, connected to the distribution network in Western Bulgaria; 67% of which property of CEZ a.s. Czech Republic, and the rest 33 % of other minority shareholders - legal entities and individuals.

CEZ Distribution Bulgaria AD is the company responsible for maintaining the network and ensuring a continuous and high quality electricity supply to consumers in Western Bulgaria. Majority shareholder of CEZ Distribution Bulgaria AD is CEZ a.s. Czech Republic, which owns 67% of the company's capital. The remaining 33% are the property of other minority shareholders - legal entities and individuals.

EVN Bulgaria EAD was established after the privatization of the energy companies in Plovdiv and Stara Zagora in the beginning of 2005. Initially the group EVN Bulgaria encompassed business activities in the field of electricity distribution and sales in Southeastern Bulgaria.

EVN Bulgaria Electricity supply EAD is a company owned at 100% by the Austrian energy company EVN AG. The activity of the company is in the field of electricity supply and related services. The company holds a license for electricity supply in the regulated market and supplies with electricity more than 1.5 million customers in Southeastern Bulgaria.

EVN Bulgaria Distribution EAD is a company owned at 100% by the Austrian energy company EVN AG. The activity of the company is electricity distribution network operation, transmission and distribution. The company holds a license for electricity distribution and serves a territory of about 42 000 km² in Southeastern Bulgaria.



In the end of June 2012 Energo-Pro bought the business of the German company E.OH in Bulgaria and thus acquired companies, holding licenses for the following energy activities – electricity distribution (Energo-Pro Grid AD), electricity supply (Energo-Pro Sales AD) and electricity trade (Energo-Pro Energy Services EOOD).

The license territory of Energo-Pro Grid AD and Energo-Pro Sales AD is about 30 000 km² and covers 9 administrative districts in Northeastern Bulgaria - Varna, Veliko Tarnovo, Gabrovo, Dobrich, Razgrad, Rouse, Silistra, Targovishte and Shumen.

3.1.2. Technical operation

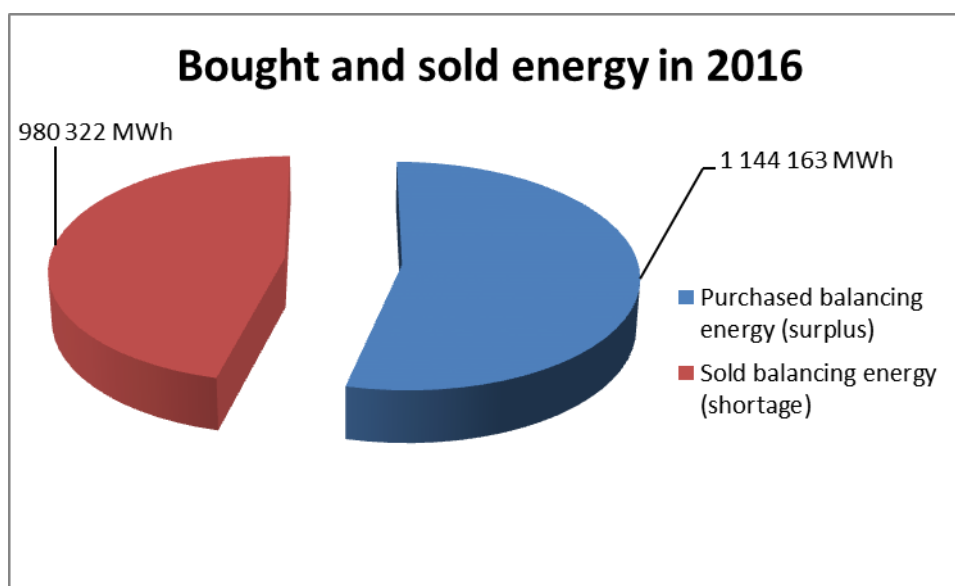
Provision of balancing services

Electricity market organization and operation in the country are regulated by the Electricity Market Rules (EMR) and Auction rules on procurement and allocation of transmission capacity on the interconnections in the control area of ESO EAD and the neighbouring control areas for 2016 and is administered by ESO EAD. ESO EAD maintains a register on its website about the active balancing energy suppliers from primary, secondary and tertiary regulation and activated cold reserve blocks. The independent transmission operator maintains the balance of the EPS according to technical and economic criteria based on balancing market bids and offers. Balancing energy suppliers are all generators who operate adjustable units. Balancing energy price is set under a mechanism regulated in EMR and a methodology, an integral part of them.

EWRC's observations on the work of balancing electricity market in Bulgaria in 2016 show that the market operates stably and provides predictable environment in the relations between all market participants. Decision № II -50 of 30 Dec 2015, the Commission kept the marginal price unchanged for transactions on the balancing energy market, namely:

- price cap for transactions on the balancing energy market for upward regulation (in case of energy shortage) at the amount of 202.00 BGN/MWh and
- price cap for transactions in the balancing energy market for downward regulation (in case of energy surplus) at the amount of 0.00 (zero) BGN/MWh.

The common power shortage in 2016 was 980 322 MWh, compared to 968 079 MWh in 2015, which represents increase in power shortage by 1.26% and by 3.98% of the registered schedules. The energy to cover the energy surplus in 2016 was 1 144 163 MWh, which is almost 28% less than the previous year, when it was 1 462 416 MWh and represents 4.65% of the registered schedules.



Balancing energy price is set for each settlement period as two balancing energy prices. The average 2016 energy shortage price was 185.58 BGN/MWh, compared to 184.63 BGN/MWh in 2015. The average energy surplus price in 2016 was 14.45 BGN/MWh, compared to 10.83 BGN/MWh in 2015.

The table below depicts the minimal, maximal and average balancing energy prices for shortage and surplus in 2016:

Balancing top-up energy	
Minimum price, EUR/MWh	32.17
Maximum price, EUR/MWh	514.93
Average price, EUR/MWh	94.89

Balancing spill energy	
Minimum price, EUR/MWh	0
Maximum price, EUR/MWh	16.03
Average price, EUR/MWh	7.39

At present, the prices offered by balancing energy suppliers in Bulgaria are not tied to spot prices in the day-ahead market but are constant on a monthly basis, which is the reason for the higher average prices in the Bulgarian balancing market. It should be borne in mind

that the day ahead market is not sufficiently developed and liquid enough to serve as a basis for both setting a reference price and linking the prices of suppliers to balancing energy with its results. This, in turn, leads to a lack of predictability and sustainability, and tends to be preferred by trading participants to OTC through bilateral contracts.

When an increase in the thresholds for trading in the balancing energy market and a practice set by the suppliers to offer prices close to the marginal costs are in place, market participants' imbalances will increase, which will lead to an additional financial burden on generators and consumers, at a time when there are unpredictability and uncertainty about the ongoing processes of full market liberalization and exchange trading launch.

The downward price cap should be the same for all market participants, regardless of whether the capacity utilized is generating and/or consuming. In this way non-discriminatory and equal treatment of the power plants offering this system service is ensured by not favouring a certain participant at the expense of others and prevents speculative behaviour. Market principles call for a downward price to be a positive one. At a negative price, the power plant providing the system service sells shortage and the surplus buyers buy it, which is contrary to the balancing market principles and leads to extreme balancing energy costs and high imbalance costs. The negative downward price is an excessive penalty for generators and consumers who are in surplus, which distorts the market, jeopardizes its work and contradicts European practices.

In 2016 the following were registered in the balancing energy market:

- 53 standard balancing groups' coordinators, which is almost double to previous year (27);
- 15 special balancing groups' coordinators;
- 14 combined balancing groups' coordinators.

Monitoring time taken to connection and repair

In relation to the application of the legal requirements under art.116, para.7 of EA on technical terms and conditions for connection of clients and generators to the transmission or distribution networks, EWRC adopted by a decision some amendments and supplements to Ordinance № 6. Changes have been put in force since their publication in SG/77 of 4 Oct 2016.

These amendments relate to Decision № 411 of the Council of Ministers of 19 May 2016 on optimization of the terms for connection to the networks of the technical infrastructure of the Republic of Bulgaria.

In order to speed up the electricity grids connection procedure, the deadline of 15 (fifteen) days has been changed to 7 (seven) working days, regulated in art.13, para.3 and art.21, para.11 of Ordinance № 6. The same deadlines apply for projects coordination done by the network operators in connection with the construction of the connection facilities after the signing of the connection contracts.

The deadlines for preliminary connection contracts have also been changed from 30 (thirty) to 25 (twenty-five) days, regulated in art.12, para. 2, art. 53, para. 3, art. 58, para. 2 and art.109, para.1 of Ordinance № 6.

The adopted amendments aim to contribute to shortening the time in the connection procedure to the electricity transmission and distribution networks.

Within its statutory powers, by conducting current and ex-post control and in fulfilment of the obligations under art.37, para.1, item m of Directive 2009/72/EC, EWRC shall monitor the time spent by transmission and distribution system operators on network connections and related repairs.

In this regard, EWRC carried out scheduled inspections of ENERGO-PRO Grids AD and ERP Zlatni Piasaci AD concerning the fulfilment of the conditions under the licenses issued to the companies for carrying out the activity "electricity distribution". In the course of the inspection, no violations were found regarding the observance of the statutory deadlines for the connection of customers and generators to the respective networks.

Monitoring safeguard measures

In the event of a sudden crisis in the energy market and where the physical safety and security of persons, equipment, facilities or EPS integrity is threatened, a Member State may temporarily take the necessary protective measures. Such measures must cause the least possible disturbance in the internal market operation and must not be wider in scope than is strictly necessary to remedy the sudden difficulties which have arisen.

Under the Energy Act, ESO EAD carries out unified operational planning, coordination and management of the electricity system. The main tasks to be performed by ESO EAD and associated with the centralized operational management of EPS, include operational management of EPS, power and energy regimes and electrical loads forecasting, generation capacities planning and EPS operational mode.

Participation in voltage control is the responsibility of all power generators connected to the transmission network, in line with the requirements of ESO EAD and the technical capabilities of their generation units. Participation in the preventing EPS control is the responsibility of all grid users, in accordance with the EPS security plan requirements and the EPS recovery plan, electricity supply continuity, ENTSO-E requirements compliance and the electricity system management rules, with minimum loss of active energy in transmission and transformation.

The work of the managing and regulating systems in power plants and the automation system in substations are under constant control. Systematic tests are periodically organized and conducted in order to check the readiness of power plants to provide additional services and the implementation of the security recovery plans.

All planned or coordination activities of ESO EAD in 2016 were based on load and power consumption forecasts and for the relative purposes: investment planning forecast period more than five years, monthly annual planning, daily month planning, daily week planning, hourly day planning or internal day re-planning.

Maintaining electricity transmission voltage levels within the allowed limits, ensures reliable and safe EPS operation, the technical and economic characteristics of electrical equipment, sustainable operation of synchronous generators and is a condition for reducing losses in electricity transmission and transformation. Voltage control is done centrally by a “Voltage Schedule” that is monthly developed, set and monitored by ESO EAD.

Assessment of expected maximum EPS load, transmission network bottlenecks under normal and repair schemes and options for voltage regulation in the limits of available technical means, is carried out by planning a winter maximum regime. It is prepared by the National Dispatching Centre (NDC) based on a perspective model, including the projected balance of generation capacities and of control days’ load readings. Based on this scheme measures are proposed to increase the transmission capacity of the electricity network and to avoid bottlenecks.

Computational models, collecting and processes information daily, both within the National Dispatching Centre (NDC) and within ENTSO-E according to the procedure for the daily forecast of day ahead electricity system limitations (DA CF - Day Ahead Congestion Forecast), are used to assess the security and operational planning mode of the transmission network. Up-to-date load flows allocation model results from the procedure, reflecting the neighbouring and the Bulgarian electricity system status, which contains: topology, load and generation. Based on this model, daily security checks of the electricity system operation and the “n-1” criteria compliance are made.

The parallel work of Bulgaria with neighbouring countries, members of ENTSO-E in 2016 was realized through interconnectors and was based on the principles of mutual benefit, solidarity and mutual assistance in emergency situations - to ensure safe, quality and efficient supply to electricity consumers. The existing Bulgarian electricity system interconnections

ensure the necessary technical conditions for the exchange of significant amounts of electricity in normal and emergency modes.

3.1.3. Connection and access network tariffs

Transmission and distribution network tariffs to end consumers are approved by EWRC upon the companies' proposal in time and form specified under Ordinance № 1 of 18 March 2013 on electricity prices regulation.

Different consumers' groups and tariff structures are specified according to companies' proposals and are grouped according to the voltage level and daylight zones. Network services are paid based on electricity consumption. Transmission services and access are paid by consumers connected to the electricity transmission and distribution networks, distribution companies, traders with export transactions and traders with transactions on behalf of a network services user.

In 2016 by Decision № II-19 of 30 June 2016 EWRC approved electricity and networks services prices after analysis and evaluation of the reported results from the electricity companies during the current pricing period.

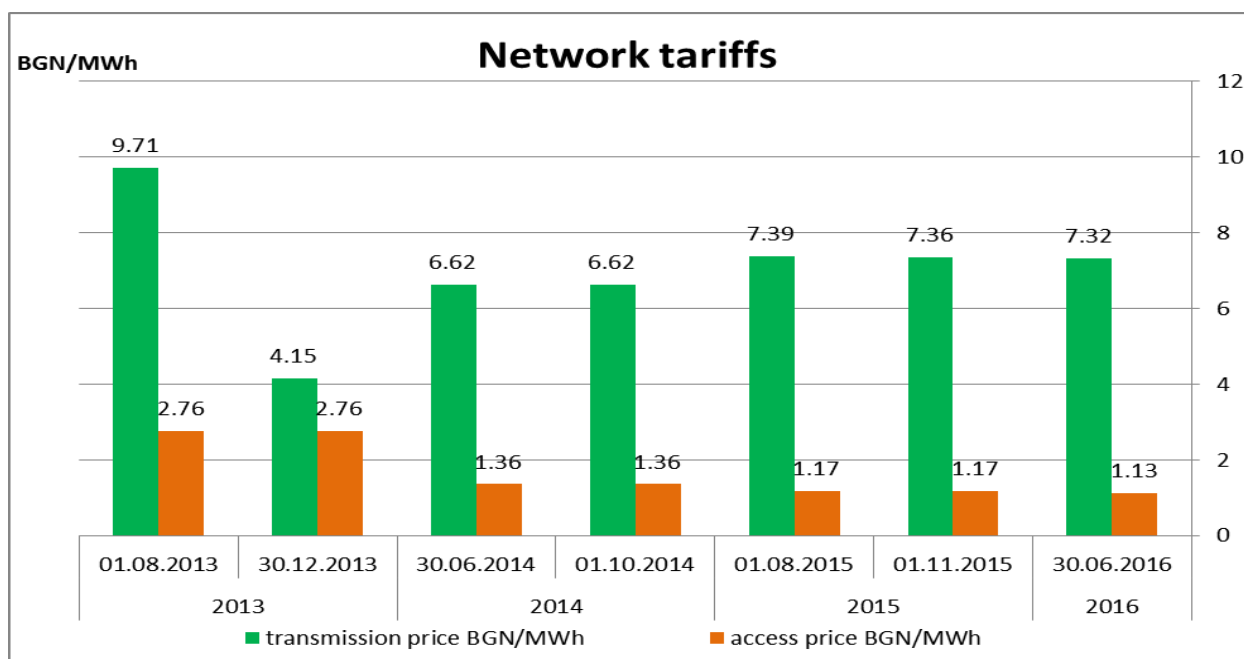
Transmission and access to the electricity transmission network

Regulating the network tariff for transmission through the transmission network, where the EWRC uses the method "rate of return" regulation.

The approved by EWRC Decision № II-19 of 30 June 2016 prices and pricing elements for the activity of transmission and access to the transmission network are shown in the following table:

Pricing decisions		2015		2016
		01.08.2015	01.11.2015	30.06.2016
Transmission price	BGN/MWh	7.39	7.36	7.32
Annual revenue requirements	thou BGN	305 020	304 057	294 708
Estimated power amounts for the regulated period	MWh	41 297 200	41 297 200	40 283 089
Access price	BGN/MWh	1.17	1.17	1.13
Annual revenue requirements	thou BGN	48 503	48 503	45 646
Estimated power amounts for the regulated period	MWh	41 297 200	41 297 200	40 283 089

The following graph shows the change in transmission and network access prices over the last four years. It shows that the access price and the transmission price decrease, which is a consequence of a reflected fall in the generation, consumption and export of electricity.



Access price for renewable energy sources (RES) generators – solar and wind

In order to maintain the EPS balance, ESO EAD balances at every moment the unintentional random deviations, incl. The ones resulting from accidents, electricity load, generation capacities and interconnection exchanges. In addition, the electricity generation from PvPP and WPP, unlike the electricity generation from HPP and biomass power plants, has a mutable nature, as it is heavily dependent on variable meteorological conditions and adds to the cost of ancillary services availability, to the costs for the full-bodied participation in power plants regulation, to the turn on/off costs and reserve costs.

These variations are able to offset each other, but are very often cumulative, leading to even greater deviations and require additional balancing costs.

On the basis of the data submitted by the Transmission Operator and the justification made, EWRC by Decision № C-19 of 30 June 2016 approved a price of access to the electricity transmission network of ESO EAD paid by electricity generators from PvPP and WPP, connected to the electricity transmission and distribution networks, at the amount of 7.02 BGN/MWh.

Prices are payable to ESO EAD by all electricity generators using renewable sources (solar and wind) and selling their energy at feed-in-tariffs, regardless of the connection point.

Transmission and access to the electricity distribution networks

Regulating the network tariffs for the electricity distribution companies, the Commission applies incentive-based (revenue cap) regulation. The Commission approves the revenue requirements of the energy utility for the first year of the regulatory period and analyses and adjusts them for each subsequent year of the regulatory period. The envisaged adjustments of the revenue requirements are related to the inflation rate, the efficiency ratio and target quality indicators performance, the difference between forecast and actual expenses, expenses for energy sale/purchase, as well as differences in expenses incurred by the change in the number of consumers (correction by factor Z).

Technological costs

EWRC approves a maximal amount of technological costs for the transmission and distribution companies in line with art. 21, para. 1, item 19 of EA and art. 10, para. 5 and 6 of Ordinance № 1 on pricing.

By Decision № II-19 of 30 June 2016 EWRC kept the technological costs' target values for the distribution companies the same, in accordance with the reports presented and for each company they are as follows:

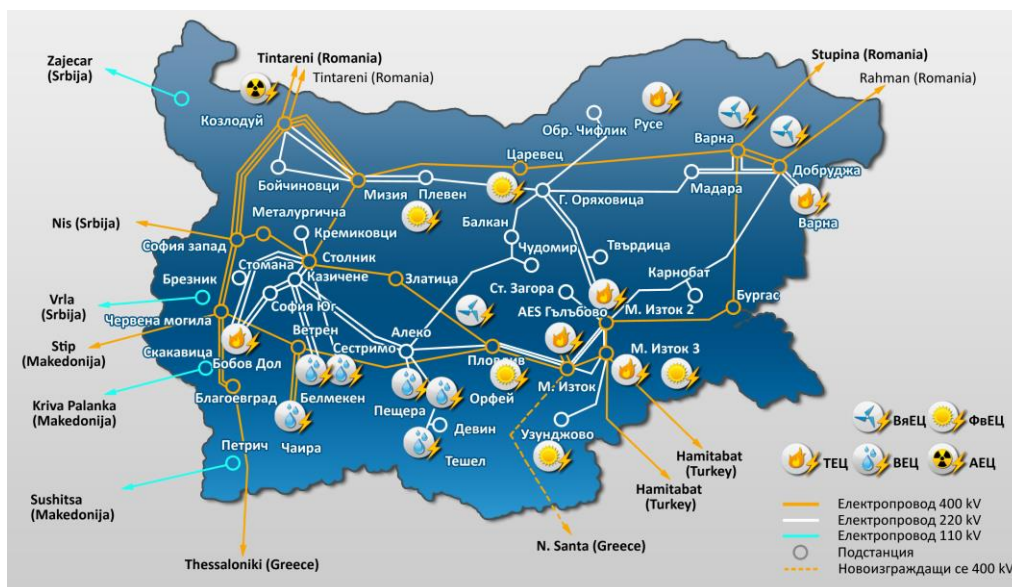
- CEZ Distribution Bulgaria AD – 8%;
- EVN Bulgaria Distribution EAD – 8%;
- ENERGO-PRO Grids AD and – 9%;
- ERP Zlatni Piasaci AD – 5%.

3.1.4. Cross-border issues

Cross-border infrastructure access, including capacity allocation and congestion management procedures

Auction rules were developed in line with Regulation (EC) № 714/2009 on conditions for access to the network for cross-regional cooperation between operators, by introducing common rules and procedures for the allocation of available transmission capacity in both directions on the interconnections of the EPS of Bulgaria and neighbouring power systems. The purpose of these rules is to ensure optimal networks management, promoting energy exchanges development and coordinated allocation of cross-border capacity through non-discriminatory market-based solutions.

ESO EAD pursuant to art.109, para.1 item 3 of EA is obliged to provide the joint operation of the electric power system and the electric power systems of other countries in accordance with international treaties. Regulation (EC) № 714/2009 imposes an obligation on national regulatory authorities to ensure compliance with the Regulation and the guidelines adopted in accordance with Art.18 thereof, for the establishment of regional cooperation between transmission system operators (Art. 12 and Art. 13 of the Regulation). Regarding the operational management and the available transmission capacity allocation on the interconnections, ESO EAD, in its role as an electricity system operator of the Republic of Bulgaria, and the neighbouring electricity system operators have signed Memorandums of cooperation. Bulgaria has five neighbouring control areas (Greece, Romania, Serbia, FYROM and Turkey), for which annual, month and daily transmission capacity allocation auctions are carried out.



The provision and allocation of the available transmission capacity on the interconnections is coordinated and carried out through the application of auction rules developed jointly by the Bulgarian electricity system operator ESO EAD and the neighbouring electricity system operators. The Auction Rules regulate in detail the registration and participation requirements, different types of auctions, organization and

tender procedures, settlement of the auction results and granting transmission capacity rights (TCR) together with rules for their use, the TCR secondary market TCR transfer, settlement and payment requirements and deadlines, transmission capacities reducing principles, etc. EWRC, in its capacity as a national regulatory authority and in line with art.19 of Regulation (EC) № 714/2009, annually agrees Auction Rules for allocation of transmission capacity on the interconnections between the control area of Electricity System Operator EAD and neighbouring control areas.

In December 2015 EWRC adopted new Auction Rules on the introduction of an interconnection coordination scheduling process of annual and monthly capacity and organizing and conducting daily auctions for the allocation of unused capacity between Bulgaria and Turkey. Changes were made in connection with the signing of a memorandum between ESO EAD and the Turkish system operator TEIAS for 2016 and in pursuance of the requirement of Regulation (EC) № 714/2009 to provide market participants with maximum capacity on the interconnections and transmission networks affecting cross-border flows.

Cross-border transmission capacity calculation is done following a procedure approved by ENTSO-E. ESO EAD collects the interconnections schedules (so-called “external schedules”) of market participants and based on it the operator prepares an hourly schedule for cross-border exchanges for the Bulgarian control area and coordinates them with the neighbouring control areas system operators.

In connection with the frequency and the exchange capacities management and to ensure the necessary reserves under active power, ESO EAD prepares and submits to ENTSO-E’s North Coordination Centre in Brauweiler (Amprion GmbH) coordinated with other control areas and blocks hourly schedules, electricity exchanges (import and/or export) and controls the execution of the technical conditions under signed commercial, non-commercial, bilateral and multilateral agreements for electricity sale and exchange.

National Dispatching Centre (NDC) reports, controls and coordinates the physical hourly, daily and monthly electricity exchanges on all interconnections (state border) with the respective system operators. It calculates the unscheduled electricity exchanges of the Bulgarian EPS in parallel operation to the synchronous area of Continental Europe and calculates and verifies the compensation schedules (programs) for their compensation.

According to metering data and calculated border exchanges in 2016 Bulgarian EPS received 4 568 412 MWh electricity from neighbouring EPSs, which is an increase by 7.9% compared to data in 2015, and exported 10 940 640 MWh, which is 34% less than 2015.

Coordinated electricity exports of Bulgarian origin from market participants (Bulgarian time) according to interconnection schedules data and declared amounts for 2016, was 6 546 223 MWh, representing a decrease of 38% compared to 2015, when trade exports of Bulgarian origin were 10 562 401 MWh.

Utilizing revenues for the interconnections

In pursuance of the provisions of art.16, para 6 of Regulation (EC) № 714/2009, any revenues resulting from the allocation of interconnections shall be used for the following purposes:

- a) guaranteeing the actual availability of the allocated capacity;
- b) maintaining or increasing interconnection capacities through network investments, in particular in new interconnectors.

In cases, where revenues cannot be efficiently used for the purposes set out in the above mentioned items, they may be used, subject to approval by the regulatory authorities of the Member States concerned, up to a maximum amount to be decided by those regulatory authorities, as income to be taken into account by the regulatory authorities when approving the methodology for calculating network tariffs and/or fixing network tariffs.

Monitoring technical co-operation between Community and third-country TSOs

Regional cooperation in the field of infrastructure projects represents a significant part of ESO EAD's activity in terms of cooperation with the neighbouring countries' electricity systems. In this regard, the attention of transmission system operators is focused on infrastructure projects designed to increase interconnection capacity in order to improve the energy exchange between adjacent systems and to eliminate potential congestion.

By a decision of the Council of Ministers of 13 July 2016, the new 400 kV interconnection between substation Maritza East, Republic of Bulgaria and substation Nea Santa, the Hellenic Republic, which is to be constructed, was designated as a site of national importance in the territory of the Republic of Bulgaria. The interconnection is part of the PCI cluster 3.7 "Bulgaria – Greece: reinforcement" within the meaning of Regulation 347/2013 on guidelines for trans-European energy infrastructure. This PCI cluster includes four lines for the realization of the priority electricity corridor North – South: three of them in Bulgarian territory and one interconnection. The 400 kV interconnection Maritza East – Nea Santa is 122 km long in Bulgaria and 29 km in Greece and has capacity of 1500 MW. The interconnection route in Bulgaria crosses the territories of the municipalities of Simeonovgrad, Haskovo, Kardzhali, Momchilgrad and Kirkovo. Total envisaged cost for the construction in Bulgaria is estimated at € 60.7 million.

Project "New 400 kV internal line between substation Maritza East and substation Plovdiv" is a PCI under Regulation 347/2013 on guidelines for trans-European energy infrastructure.

Project "New 400 kV internal line between substation Maritza East and TPP Maritza East 3 switchboard, together with the other two 400 kV internal lines (3.7.2. New 400 kV internal line between substation Maritza East and substation Plovdiv and 3.7.4. New 400 kV internal line between substation Maritza East and substation Burgas), is part of the cluster 3.7. Bulgaria – Greece shall have capacity of 1500 MW each. Their implementation will provide the conditions for meeting European and national renewable energy targets and reducing climate change in the long term (beyond 2020, as well).

As part of the implementation of the electricity corridor North-South the construction of New 400 kV internal line between substations Dobrudga and Burgas was planned – part of 3.8 Cluster Bulgaria — Romania capacity increase. This project has been included in the National development plan for Bulgaria, as well as in TYNDP 2012 and ENTSO-E's TYNDP 2014. The project is required for the implementation of the North-South Priority Corridor; it has a major impact on the security of supply for the region and contributes to system sustainability, interoperability and security of operations. The commissioning of the Dobrudja - Burgas 400kV line will guarantee the security of cross-border exchanges between Bulgaria and Romania.

As part of the implementation of the electricity corridor North-South the construction of New 400 kV internal line between substation Maritza East and substation Burgas has been planned, part of the cluster 3.7. Bulgaria – Greece between Maritza East and Nea Santa, including the following projects:

3.7.1. New 400 kV interconnection between substation Maritza East, Republic of Bulgaria and substation Nea Santa, Greece;

3.7.2. New 400 kV internal line between substation Maritza East and substation Plovdiv;

3.7.3. New 400 kV internal line between substation Maritza East and TPP Maritza East 3 switchboard;

3.7.4. New 400 kV internal line between substation Maritza East and substation Burgas.

Monitoring of national development plans and investment plans related to the 10-year network development plan of ESO EAD and PCIs

In pursuance of Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing

Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, EWRC adopted *Methodology and criteria for evaluating investments in electricity and gas infrastructure projects*. The Methodology regulates the rules, which EWRC should follow in order to identify and evaluate the risks of the projects of common interest that are necessary for the realization of large infrastructure corridors of great priority and the achievement of the main goals of the European Union's energy policy regarding competitiveness, sustainability and security of supplies. The Methodology shall facilitate PCI promoters in the preparation of their projects and shall ensure transparency and objectivity of their evaluation.

By Decision № II-1 of 22 April 2016 EWRC determined the cross-border investment costs allocation for PCI 3.8.1. New 400 kV internal line between substations Dobrudga and Burgas, to be 100% at the expense of the Bulgarian side, of which ESO EAD shall provide 50% of the investment costs.

The Electricity system operator became eligible for financial support from the Connecting Europe Facility (CEF) for the construction of 400 kV internal line between Maritza East and Burgas. The grant amounts at 50% of the project value. Total project costs are about 116 million BGN and envisages the construction of 133 km 400 kV overhead line between Maritza East and Burgas with capacity 1500 MW. The power line is part of the internal 400 kV transmission network of Bulgaria. The overhead line is part of the PCI cluster 3.7. Bulgaria – Greece under Regulation 347/2013. The project is required for the implementation of the North-South Priority Corridor and for the construction of trans-European energy infrastructure; the cluster has a major impact on the security of supply in the region and contributes to system sustainability, interoperability and security of operations, increases the net transmission capacity of the two borders (Bulgaria – Greece and Bulgaria – Turkey) and accelerates market integration, competition and system flexibility. The power line construction is of system importance for Bulgaria and enhances the secure operation of the transmission system. The project 400 kV internal line between Maritza East and Burgas is part of the ESO EAD TYNDP and ENTSO-E's TYNDP.

In line with art.21, para.3, item 8 and art.81d of EA, EWRC approves the Ten-year network development plan (TYNDP) and monitors and controls its implementation. Obligation for EU TSOs to draft TYNDP is stipulated in art.22 of Directive 2009/72/EC. The Ten-year network development plan for Bulgaria has been developed in pursuance of art.81d of EA and Chapter two, section three of the Electricity Power System Management Rules in compliance with ENTSO-E's requirements.

Cooperation

Pursuant to Regulation 2015/1222, ESO EAD as a transmission system operator and IBEX EAD, in its role of a market coupling operator, submit to EWRC for approval Methodologies or terms and conditions developed by them. On the grounds of art.9, para.5 of Regulation 2015/1222, each regulatory authority shall approve the terms and conditions or methodologies used to calculate or set out the single day-ahead and intraday coupling developed by TSOs and NEMOs.

In its capacity of a regulatory authority EWRC shall consider the submitted papers in line with the Regulation. By protocol № 207 of 14 Oct 2016 EWRC took a decision on a request for amendment of the submitted by IBEX EAD proposal of all NEMOs for a plan that sets out how to jointly set up and perform the MCO functions in line with art.7, para.3 of Regulation 2015/1222.

In May 2016 EWRC approved Proposal of all TSOs regarding the determination of capacity calculation regions in compliance with art.15 of Regulation 2015/1222.

In 2016 EWRC realized cooperation with the regulatory authorities of the neighbouring countries regarding issues connected with the cross-border exchange in the region. The main direction was the negotiation of agreements with the regulatory authorities of the neighbouring countries, which ensure the security of electricity and electricity supply.

Ипез 2016 activities carried out in relation to ACER and CEER in the electricity market area include:

- Collecting, analysing and delivering data for the ACER and CEER Market Monitoring Report on markets development for 2016;
- Participation in electronic procedure and approving the ACER Opinion on Regional lists of proposed projects of common interest in electricity and natural gas for 2016;
- Filling in ACER database with electricity exchange values and characteristics in 2016, the Agency's annual report under Electricity Regional Initiative (ERI) on the basis of ESO EAD data;
- Updating information for regular six-month and annual ACER reports on ERI progress;
- Questionnaire filling out on electricity transmission losses;
- Questionnaire filling out on the implementation of the Third Energy Package.

International projects

Implementation of the European electricity market in Bulgaria - II phase

In September 2014, the project "Implementation of the European electricity market in Bulgaria - II phase" was launched, realized under the Programme BG04 "Energy efficiency and renewable energy". The program is financed by the Financial Mechanism of the European Economic Area (EEA FM) 2009 - 2014 based on the signed Memorandum of Understanding between the Republic of Bulgaria and the Kingdom of Norway, Iceland and Liechtenstein. The Energy and Water Regulatory Commission was a Project promoter and Partner was the Norwegian Directorate of Water Resources and Energy (NVE) to the Ministry of Petroleum and Energy, Norway. ESO EAD and IBEX EAD were participants too.

Till the end of 2016 the first three main tasks were completed on evaluation of the EU and the Bulgarian electricity markets and development of market monitoring structure and activities at EWRC - an activity that EWRC should perform under its competence of a national regulatory authority. The other two tasks are dedicated to recommendations for harmonization and amendment of the Bulgarian Electricity Market Rules in compliance with the EU and the Network Codes requirements in electricity market and the Bulgarian market integration with neighbouring market zones and coupled markets.

Workshops, trainings and study tours to the energy regulators of Norway, Austria, Hungary and Romania have been organized, as well as in power exchanges offices.

Presentations, reports, questionnaires and the Electricity Market Monitoring Handbook for EWRC have been developed by the consultant Nord Pool Consulting.

The deadline scheduled for the activities implementation is February 2017.

3.1.5. Compliance

The regulatory authority obligation under art.37, § 1, d of Directive 2009/72/EC on the application and control of the execution of legally binding decisions of the European Commission or ACER, is transposed in EA, art. 21, para.1, item 31.

In 2016, basic principles guiding the EWRC activities in the exercise of its regulatory powers were to prevent and non-admit the restriction or distortion of competition in the energy market, as well as to balance the interests of energy companies and consumers.

In exercising its powers, the Commission analyses the work and behaviour of the energy companies that it monitors, aiming to create conditions for preventing the abuse of monopoly position or the competition limiting/distortion in the Bulgarian energy market. Within the territory of the country, in view of its special competence, the authority responsible for the application of the Community competition law is the Competition Protection Commission (CPC). To that end, in order to achieve the above objectives EWRC has the power under art.21, para.6 of EA, to refer to CPC and the Commission for Consumer Protection (CCP), which in turn to consider the submitted information and after evaluating the

facts on the specific case, may institute proceedings under the Law on Protection of Competition, respectively the Consumer Protection Act.

National legislation ensures that the regulator takes its own decisions independently and that they are not subject to control by the executive power, but in line to art.13 of EA only a subject to judicial review concerning their lawfulness.

Under Art.21, para.3 of EA concerning the implementation of EWRC's powers to regulate the activity of the Independent System Operator (ISO), the Commission approves the 10-year transmission network development plan of ESO EAD. EWRC shall also ensure that the ISO compliance officer performs his obligation to monitor the compliance programme observation and submits to the Commission quarterly reports on its implementation, as well as an annual report setting out the measures taken to implement the compliance programme. Evidenced by the incoming to EWRC 2016 reports, there were no irregularities in the compliance programme implementation. Under art.81d, para.5 of EA, EWRC shall monitor and evaluate the implementation of the developed by TSO Ten-Year Transmission Network Development Plan and, after consultation with all stakeholders, annually submits to the Commission for approval. EWRC examines whether the TYNDP covers all the investment needs identified during the consultation process and whether it is in line with the TYNDPs in the European Union. In case the ITO fails to make an investment which, according to the TYNDP, should be carried out in the following three years, EWRC has the power to oblige the operator to make the necessary investments, if they still need to be carried out. The operator will be also obliged to ensure that the costs of these investments are reimbursed through network service charges unless the non-compliance is due to compelling reasons beyond the control of the network operator.

ACER provides an integrated framework within which national regulatory authorities (NRAs) cooperate in order to perform their tasks at EU level. This framework is designed, among others, to support the development of EU-wide rules (network codes) and their consistent implementation across the European Union, and other activities where NRAs are expected to coordinate their actions.

3.2. Promoting competition

3.2.1. Wholesale market

Wholesale market description

Wholesale market parameters

Bulgaria has a diverse power generation mix, including nuclear, thermal power plants and plants using renewables (hydro, wind, solar power plants and biomass).

Total installed capacity of all electricity generation types in the country in 2016 was 12 701 MW. Available generation capacity (without RES generators) to the annual maximum amounts at 7 608 MW, RES generators being excluded from the available generation capacity as their generation is intermittent and difficult to forecast and dispatch. Absolute maximum load was realized on 4 Jan at 7 p.m. (7 105 MW) and the absolute minimum load was realized on 24 May at 4 a.m. (2 662 MW).

Installed capacity by types of plants and generalized types of plants is shown in Figure 1.

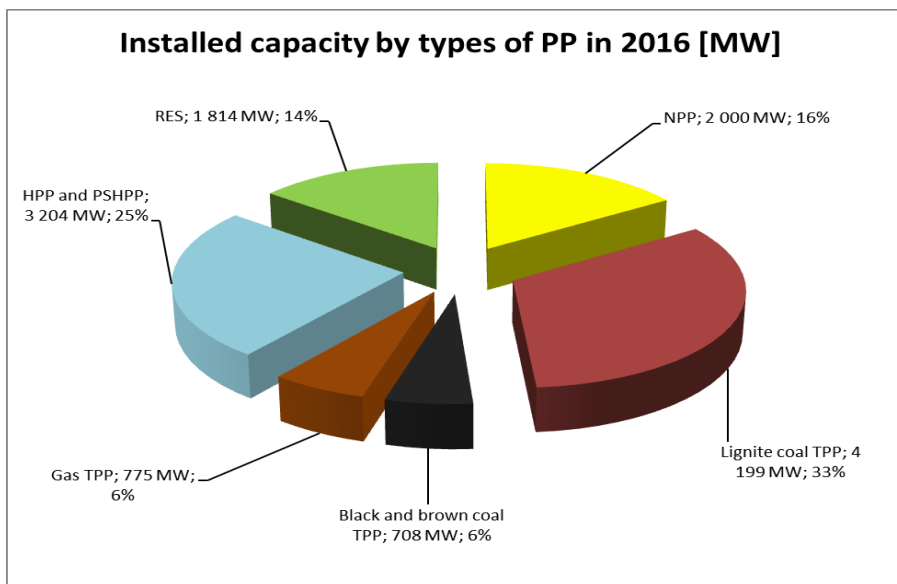


Fig.1 Installed capacity by types of power plants in % according to ESO EAD data

As it could be seen from the information presented, the largest share in the overall structure of the installed capacity in the country was that of the conventional thermal power plants - 44,74 % and the share of energy generated from renewable sources (hydro, wind, solar power plants and biomass) in the total production in the country reached 39,51%.

Total installed capacity of wind energy in 2016 amounted to 701 MW, with an annual production of about 1 426 696 MWh. In 2016 the installed capacity of photovoltaic (PV) plants was about 1 043 MW and production of 1 392 338 MWh. In 2016 the installed capacity of power plants fuelled with biomass was about 69 MW and production of 296 007 MWh.

RES installed capacity structure is presented in Figure 2 below:

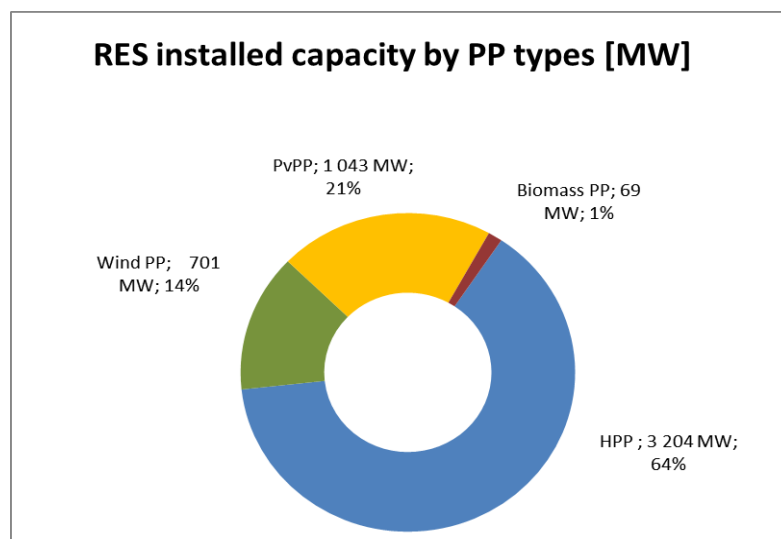


Fig.2 RES installed capacity by types of power plants in % according to ESO EAD data

Annual gross generation in the country during the reporting period (2016) amounted to 42 090 851MWh and annual consumption and own needs of power plants being 4 570 426 MWh.

Gross domestic electricity consumption in 2016 amounted to 38 TWh, with no significant change compared to 2015.

Regardless of the hard market situation in 2016 electricity commercial export in 2016 was 10 940 640 MWh, which is 34.3% less than 2015. Coordinated and declared commercial electricity export from Bulgaria carried out by market participants in 2016 was 6 546 223 MWh, which represents a decrease of 60% compared to 2015, when those exports were 10 562 401 MWh.

Electricity generation, consumption and export development is presented in the table below:

<i>Index in MWh</i>	<i>Year</i>			
	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>
<i>Gross output fed into transmission grid from PP</i>	41 072 730	44 559 309	47 399 203	42 090 851
<i>Consumption and own needs from PP</i>	4 306 159	4 718 268	4 872 286	4 570 426
<i>Net generation fed into transmission grid</i>	36 766 571	39 841 041	41 203 399	37 520 425
<i>Physical import</i>	3 350 387	4 319 338	4 232 600	4 568 412
<i>Total generation fed into transmission grid</i>	40 116 958	44 160 379	45 436 161	42 088 837
<i>Losses in transmission grid</i>	884 604	953 325	935 256	867 040
<i>Withdrawn energy from transmission grid</i>	39 232 354	43 207 054	22 892 187	41 221 799
<i>PSPP consumption</i>	1 057 064	813 789	748 281	918 394
<i>Physical export</i>	9 530 934	13 774 537	14 697 489	10 940 640
<i>Consumption from transmission grid</i>	28 644 357	28 618 728	6 910 846	29 362 765

Table 2. Source: ESO EAD

PP – power plant

Physical import – actually imported power from neighbouring countries into Bulgaria

Physical export – actually exported power from Bulgaria into neighbouring countries

Number of customers connected to the transmission network that have switched electricity supplier in 2016 was 69 and number of customers connected to the transmission network that have switched the balancing group coordinator was 69.

In 2016 the Regulator has licensed 25 new companies for the activity “electricity trades”, bringing the total number of licensed traders to 169.

The sales of generators at hourly schedules in 2016 were: Kozloduy NPP - 14 894 376,376 MWh; TPP Maritsa Iztok 2 EAD – 7 137 958,102 MWh; TPP Bobov Dol EAD – 1 908 981,840; Contour Global Maritsa Iztok 3 AD - 3 731 270,795 MWh; AES 3C Maritza East 1 EAD - 2 900 169,588 MWh and TPP Maritsa 3 AD - 37 764,975 MWh.

In 2016 quantities traded in the free market to consumers in the country were 15 526 577 MWh compared to 12 289 376,75 MWh in 2015.

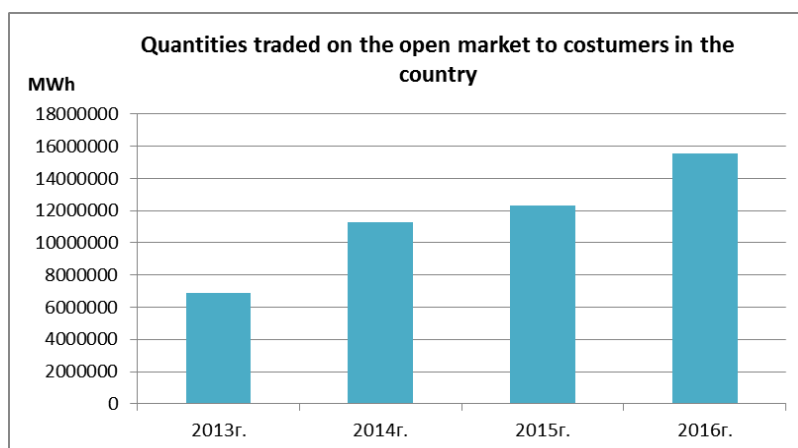


Fig.3 Quantities traded in the free market to customers in the country

Electricity generation market participants

Bulgarian Energy Holding (BEH) is the holding company for a group of companies which are principally engaged in electricity generation, supply and transmission, natural gas transmission, supply and storage and coal mining. BEH EAD activities in the power sector are carried out by four of its subsidiaries and BEH EAD controls² three of them, active in the power generation, as follows:

NEK EAD is 100 % owned by BEH EAD. NEK EAD holds licences for the activities public supply of electricity, electricity generation, supplier of last resort and electricity trades. Main clients of the company are the four electricity supply companies, the electricity transmission and distribution networks operators and free market customers.

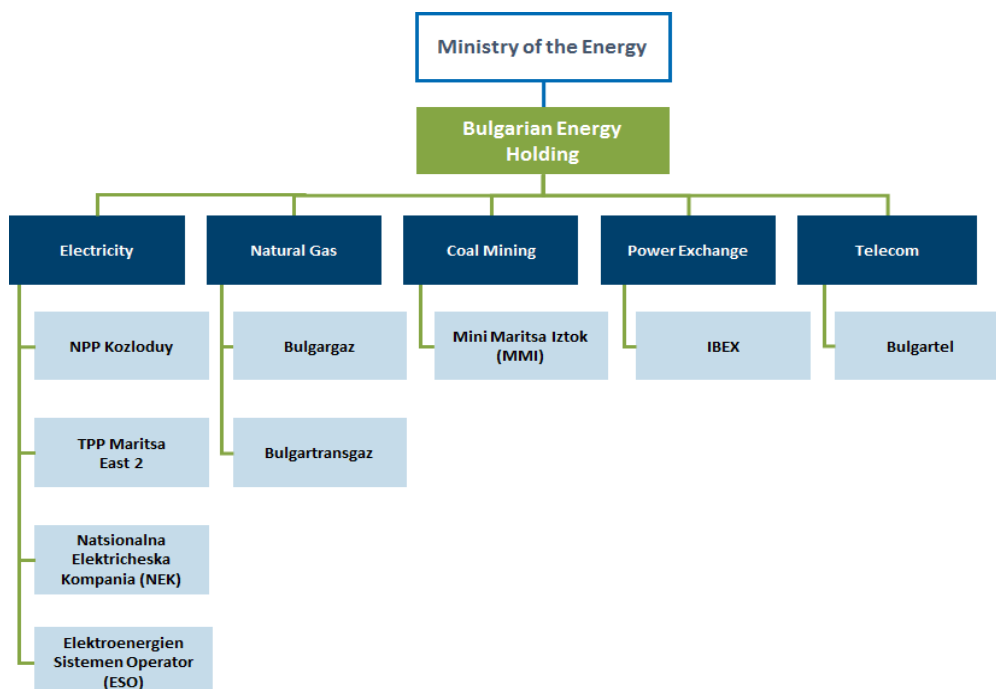
ESO EAD is 100 % owned by BEH EAD. The company holds a licence for the activity electricity transmission and maintains the operational management of the EPS in Bulgaria.

TPP Maritsa East 2 EAD is 100 % owned by BEH EAD. The company holds a licence for the activity electricity generation being the largest power plant that fuels lignite coal in Bulgaria. The TPP sells electricity generated to NEK in the regulated market and to industrial companies and energy traders at commercially negotiated prices. TPP Maritsa East 2 EAD holds a licence for the activity electricity trades.

NPP Kozloduy is 100 % owned by BEH EAD. The company holds a licence for the activity electricity generation, based on nuclear energy. The company sells electricity generated to NEK in the regulated market and to industrial companies and energy traders at commercially negotiated prices. NPP Kozloduy holds a licence for the activity electricity trades.

IBEX EAD is 100 % owned by BEH EAD. The company holds a licence for the activity power exchange operation.

² The concept of control should be interpreted in accordance with Article 3 of Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings (the EC Merger Regulation).

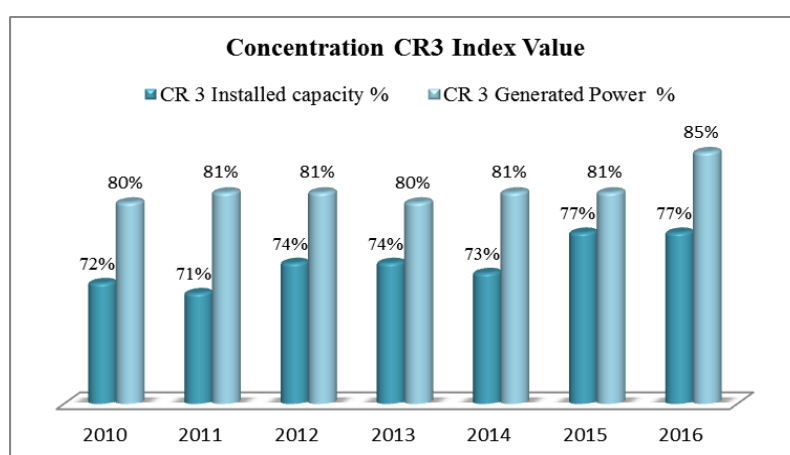


Assessment of the competitive environment

EMR define two indexes to assess the competitive market environment by determining the concentration: Herfindal-Hirschman index (HHI) and an index defining the total market share of the three largest market participants CR3.

Based on the data provided by ESO EAD, it was established that for the reported period the total market share of the three major market participants was 80-85% on the basis of energy production and 72-77% on the basis of installed capacity for the same period. In 2016, the energy-based concentration index had an increase of 5 percentage points, while there was no change for the index based on installed capacity.

According to the EMR thresholds for CR3, when concentration index values are within the range 70 - 100%, the market is defined as highly concentrated with limited competition. Effective competition exists where no market participant, alone or jointly with other commercial actors, has a significant impact on the market.



According to the calculated HHI values, the market is heavily concentrated (based on installed capacity and energy output), as it significantly exceeds the thresholds set in the EMR. For values above 1 800 units, the market is defined as a low competitive market with a high level of concentration.

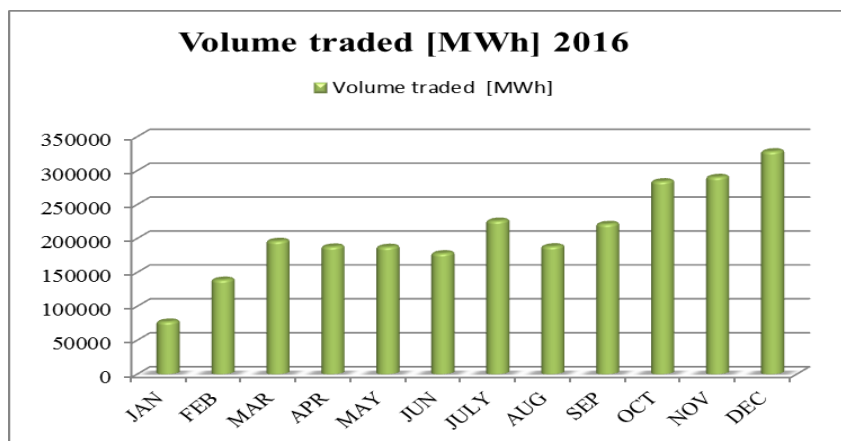
Opening the market to competition. Creating price transparency

On 19 January 2016 IBEX EAD launched its activities. The main objective of IBEX EAD is to provide a working and efficient day-ahead market for commercial transactions on the Bulgarian wholesale electricity market in a coherent, impartial, independent, transparent and non-discriminatory manner through the establishment of the day-ahead market (DAM). In 2016, the power exchange market saw a steady increase in traded volumes, which gradually creates transparency regarding the prices of traded electricity.

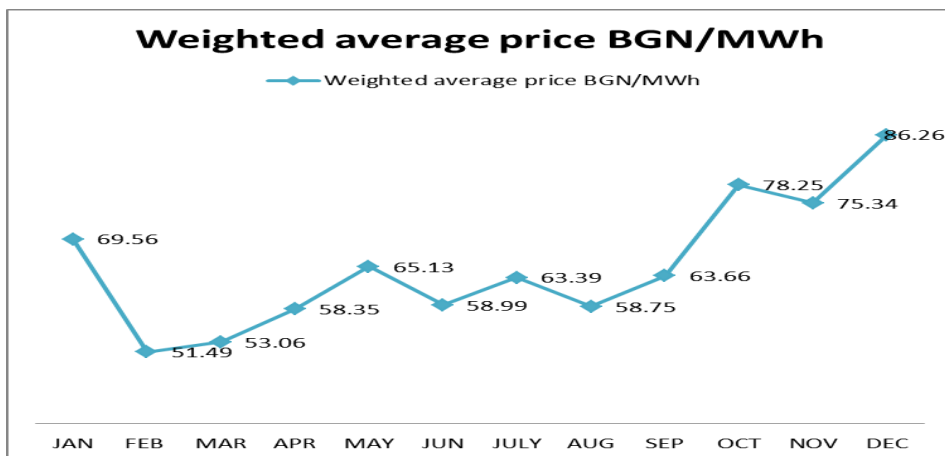
Basic annual data 2016

Parametres	Value	Unit	
Total traded volume	2 505 209,20	MWh	
Average weighted price	67,29	BGN	
Base load average price	61,53	BGN	
Peak load average price	70,28	BGN	
Off-peak average price	52,78	BGN	
Average daily traded volume	7 219,62	MWh	
Average hourly traded volume	300,82	MWh	
			Date
Lowest price per 1 hour	-19,56	BGN	15.5.2016
Highest price per 1 hour	176,02	BGN	22.1.2016

Total traded volume in 2016 was 2 505 209.20 MWh. Traded volumes on a monthly basis grew steadily. Volume growth in December compared to February was 236%, indicating a gradual development of trade through the power exchange. On 15 May 2016, the lowest price per 1 hour was realized - BGN -19.56 / MWh. On January 22, 2016, the highest price per 1 hour of BGN 176.02 / MWh was reported.



Price dynamics declined in February by 18 percentage points and in March by 16 percentage points, followed by growth in May and a fall in August. The highest prices were realized in October 78.25 BGN/MWh and in December 86.25 BGN/MWh. The weighted average price for 2016 was BGN 67.29/MWh.



For one-year period, the number of participants on the power exchange increased significantly. With 22 registered participants in January, at the end of the year they became 48. This is a double increase in only one year. EWRC views this dynamics as evidence that the wholesale market is the starting point for the future development of an efficient and transparent day-ahead market.

By Decision HO1/27.01.2016 EWRC designated IBEX EAD for a nominated electricity market operator in Bulgaria for a period of four years, in compliance with Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

Balancing mechanism, cold reserve and regulating energy

In 2016 in Bulgaria, the cold reserve and ancillary services market followed a model of bilateral contracts with notice on the day before delivery and balancing all electricity transactions. The trading participants' balancing is done by applying unified principles of negotiating and providing a reserve.

Reserve type:

- primary regulation reserve;
- secondary regulation reserve;
- tertiary regulation reserve;
- cold reserve;

ESO EAD does not pay for tertiary regulation reserve.

Negotiation period:

- Primary and secondary regulation reserves (ancillary services reserve) are negotiated on an annual basis, but each month ESO EAD sets the range for every balancing energy supplier.

- Cold reserve is purchased under auctions, usually for a month or longer period.

Reserve negotiation and provision

By the 10th day of the month preceding the month of delivery, ESO EAD determines the availability for participation in primary and secondary regulation of thermal plants for the next month.

Generators are required to allocate the specified for ESO EAD availability by aggregates scheduled to be operated on day D and inform ESO EAD on day D-1. Generators are not allowed to sell electricity on the market above the specified for ESO EAD availability.

3.2.2. Retail market

The retail market includes all electricity customers connected to the electricity distribution network. In terms of customers, the market is divided into two segments - household customers and non-household customers.

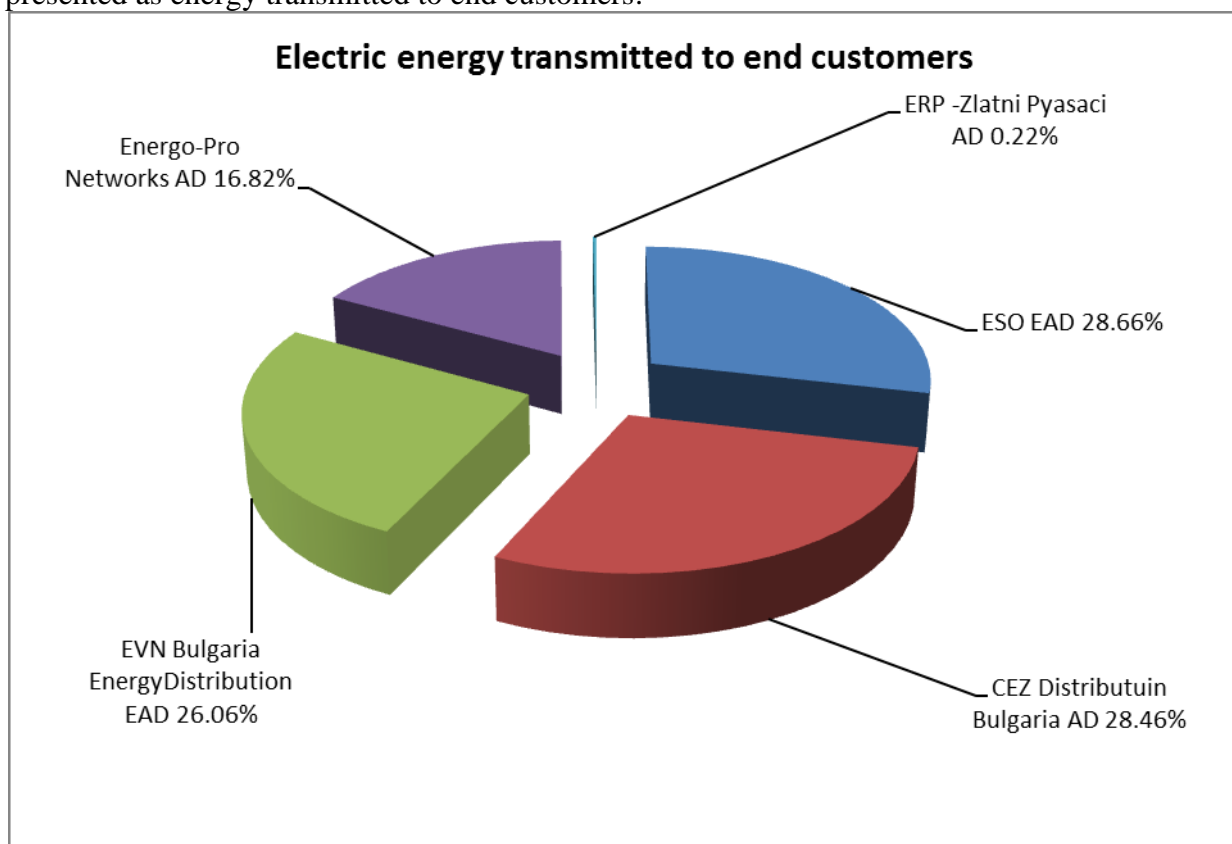
Total number of household customers in 2016 was 4 451 304 with average annual consumption 2411 kWh/r.

Total number of non-household customers in 2016 was 494 818 with average annual consumption 12 630 TWh in 2016.

Households market participants

Electricity distribution is carried out by regional companies – electricity network operators – CEZ Distribution Bulgaria AD, Energo-Pro Grid AD, EVN Bulgaria Distribution EAD and ERP Zlatni Piasaci AD.

The figure below shows the market share of the electricity distribution companies in 2016 presented as energy transmitted to end customers:



Electricity supply is carried out at regulated prices by the relevant companies of the vertically integrated companies CEZ Electro Bulgaria AD, EVN Bulgaria Electricity supply EAD, Energo-Pro Sales AD and ESP Zlatni Piasaci AD.

The process of switching supplier and transition from regulated prices to liberalized market for households started in 2015. In 2016 the number of consumers that switched their incumbent supplier was 983.

Assessment of the competitive environment

Concentration index CR3 determines the total market share of the three largest market participants and outlines the degree of market opening and the extent to which the market is competitive. The total market share of the three electricity suppliers in 2016 was 99.97%. This value of the CR3 concentration index determines the household retail market as regulated one with initial liberalization steps.

In 2016, 13 new participants entered the household retail market, which is a prerequisite for the real competitive market development in the years to come. Switching index in 2016 was 0.022.

HHI declined from 3 664 in 2015 to 3 458 units in 2016. However, these high values define the market as uncompetitive.

Non-households market participants

In addition to electricity suppliers at regulated prices, new entrants, electricity suppliers at freely negotiated prices entered the household and non-household retail market in 2015 and 2016 for clients connected to LV distribution network, which is a prerequisite for the development of a competitive market. Total number of suppliers entering into trades for the sale of electricity at freely negotiated prices in 2016 was 48, which contributes to market competition expanding. That resulted in expansion of the market at freely negotiated prices of 51.57%, on the basis of the total consumption of non-household customers in 2016, which in turn resulted in 6 535 TWh consumption of non-household customers at regulated prices, a decrease compared to 7404 TWh in 2015.

The positive dynamics in the non-household market development at freely negotiated prices is reflected in the values of the two indices determining the degree of market concentration. CR 3 index dropped from 83.11% in 2015 to 79.56% in 2016.

The HHI index declined by 11 units from 2361 in 2015 to 2150 units in 2016.

In 2016, the switching supplier index rose from 4.44% in 2015 to 8.12% in 2016, an increase of 182%.

Regulated pricing mechanism

In pursuance of the EA and the Ordinance on electricity prices regulation and by a decision of the Regulator, the following prices have been approved:

- access and/or transmission through the electricity transmission and distribution networks;
- prices of end suppliers selling to household and non-household consumers connected to electricity distribution LV network.

Regulated by EWRC prices of access and transmission for the electricity distribution companies under the Ordinance on electricity prices regulation, shall be set based on allowed by the Regulator revenue requirements for maintenance and operation of the relevant distribution network.

End prices paid by regulated market consumers include apart from the energy price the following network prices:

- price of access to the electricity transmission network;
- transmission price through the electricity transmission network;
- price of access to the electricity distribution network;
- price of transmission to the electricity distribution network, split into voltage levels – respectively MV and LV.

The implementation of long-term contracts between NEK EAD and AES Maritza East 1 EOOD and Contour Global Maritsa Iztok 3 EAD continued in 2016 as well.

To ensure supplies for customers in the regulated market, EWRC sets electricity generation availability for generators from which the Public Provider shall purchase electricity, as well as the electricity amounts, based on which the Public Provider shall conclude transactions with end suppliers. Electricity amounts purchased from generators at regulated prices, within a regulator-defined availability for each generator, are determined based on the principles of equality and transparency.

Regulated electricity price in the country is formed as a price mix of the different primary energy sources (nuclear, coal, RES and high efficient cogeneration). Electricity generated from renewables and high efficient cogeneration is purchased by the Public

Provider under long-term contracts and feed-in-tariffs significantly higher than market levels. Costs related to legal and contractual obligations for the purchase of electric power are classified as “obligations to the public” and art. 35 of the Energy Act regulates the rights of energy companies to be compensated for costs incurred resulting from their obligation to purchase electricity at feed-in-tariffs from renewable sources, high-efficient combined heat and power plants and long-term contracts.

Standardized load profiles (SLP)

Since 1 April 2016 the application of standardized load profiles (SLP) has been enforced. Thus household and small non-household customers, who are not legally obliged to have hourly metering of their consumed energy, are able to participate in the free market with freely negotiated prices. With the special *Instruction on the switching terms and conditions* for the above mentioned customers, owing sites where SLP are applied, a possibility to facilitate the transition from regulated to open market was created.

Information on SLP provided by companies can be summarized as follows:

	CEZ Distribution Bulgaria AD	EVN Bulgaria Distribution EAD	Energo-pro Grids EAD	ERP Zlatni Piasaci AD
1	Urban areas households	Household consumer, general profile	Household consumers in settlements with more than 30 000 inhabitants	Clients with business character with an obvious seasonal consumption and available capacity under 100 kW
2	Rural areas households	Household consumers, using electricity for heating	Household consumers in settlements with less than 30 000 inhabitants	Clients with household character with an obvious seasonal consumption and available capacity under 100 kW
3	Food and agricultural industry	Household consumers with district heating, gas heating or alternative heating	Businesses in settlements with more than 30 000 inhabitants and more than 40 % night consumption	
4	High-tech production	Business general	Businesses in settlements with more than 30 000 inhabitants and up to 40 % night consumption	
5	Low-tech production	Business with intense day consumption (08.00-18.00 h)	Businesses in settlements with up to 30 000 inhabitants and up to 40 % night consumption	
6	Retail / Day business	Business with intense evening consumption (18.00-22.00 h)	Businesses in settlements with up to 30 000 inhabitants and more than 40 % night consumption	
7	Evening business	Business with intense night consumption (18.00-08.00 h)	Street lighting	

8	Public lighting	Business with main activity oil product sales		
9		Street lighting, nonstop during all dark hours		

3.3. Security of supply

Implementation of safeguard measures under Article 42 of Directive 2009/72/EC

According to art.4 para.2 item 4 and 5 of EA, the Minister of Energy determines by an order mandatory indicators of the electricity supply reliability level, including measures for their implementation, and defines the necessary new generation capacities and promulgates an inventory listing these capacities in State Gazette.

Given the established regional cooperation and operational arrangements for the coordinated allocation of cross-border capacity with neighbouring system operators, as well as the agreed mutual support at emergencies, the safe and reliable operation has been ensured both in the internal and external electricity markets.

3.3.1. Monitoring balance of supply and demand

In pursuance of EA, ESO EAD elaborates short-term and long-term forecasts and electricity system development plans aiming the provision of electricity balance in the country. Based on forecasts and plans, ESO EAD provides to the Minister of Energy an electricity balance draft paper and a list of the needs for the country resources, including the needed new generating capacities and interconnection lines.

4. NATURAL GAS MARKET

4.1. Network regulation

In exercising its regulatory powers EWRC is guided by the following principles: Stimulating investment in infrastructure in a non-discriminatory way, equal access for new entrants to the networks and the market; achieving high standards for services of public interest, securing customers' choices and switching, providing protection of energy services consumers; creating incentives for energy companies to improve the effectiveness of regulated activities.

EWRC exercises control over the activities of the independent transmission operator and the distribution system operators in terms of compliance with the adopted by the Commission:

- *Ordinance № 4 of 5 Nov 2013 on natural gas transmission and distribution networks connection;*
- *Natural Gas Transmission Networks Management and Technical Rules* that regulate: the availability and operation of an information system, including all network elements, which shall be used to manage sites/facilities, to collect and archive data, to analyse the status, to test modes, etc.; the natural gas quality and determining its quality parameters; technical conditions for the safe and reliable operation of the gas transmission operator networks; technical conditions for the natural gas amounts metering; technical rules on the operational management – centralized operational management, coordination and control of the gas transmission network operational regime; operational networks technical rules in the event of gas transmission limitation or interruption; technical rules on gas transmission networks connection;
- *Rules on Natural Gas Distribution Networks Management* that regulate: relationship between the gas distribution system operator and the gas transmission system operators, network users, customers connected to the grid; other natural gas

undertakings; stages of planning, construction and development of the gas distribution network, its work organization, operation and service, its operational management, connection of consumers and providing additional services; information access provision requirements about the gas distribution network and informational coordinating procedures between the gas distribution network operator and network users; description of services provided by the gas distribution network operator; gas distribution network customer connection procedures and switching of a supplier; gas distribution network operational regimes management; regulation and metering facilities realization, maintenance and decommissioning; natural gas metering; services commercial quality; gas distribution networks and customers gas installations safety; natural gas quality; energy efficiency enhancement activities;

- *Rules for access to the gas transmission and/or gas distribution networks and storage facilities* (prom. SG/36 of 16 April 2013, amended and suppl.SG/103 of 27 Dec 2016). Defining clear rules aims at ensuring that all natural gas market participants have the opportunity of transparent and non-discriminatory access to the gas transmission network through transparent and efficient capacity allocation auction procedures, creating prerequisites for flexible use of gas networks, which will lead to competition and increasing natural gas market liquidity in the country. The amendment of these rules gives the possibility to nominate and allocate capacity both at interconnection and internal entry-exit points to be performed at a capacity booking platform RBP.

EWRC shall supervise the performance compliance of licensing activities with the issued licenses' terms by performing preventive control in the procedures of issuing licenses under EA. The Commission continuously monitors the licensed activity compliance with the licensing conditions by conducting inspections in the energy companies and exercising follow-up control over the implementation of the decisions adopted under EA. EWRC shall supervise the performance of an activity subject to licensing under the Energy Act, as well as the fulfillment of the obligation for licensees to provide access to their own facilities and to the extraction pipeline network and to provide access for their use in the cases provided for in the Energy Act. EWRC requires information from all licensees and performs on-going control over the: number of interruptions, interruption duration, service quality, number of complaints, time to respond to complaints and time to correct errors in metering, etc.

4.1.1. Unbundling and TSO certification

Bulgartransgaz EAD is an independent entity within the vertically integrated undertaking Bulgarian Energy Holding EAD (BEH EAD). Bulgartransgaz EAD owns the assets used for the activity "natural gas transmission" including the gas transmission network; the company has its own identity, separate headquarters, staff and uses separate equipment and legal, accounting and information services. Bulgartransgaz EAD has all the human, technical, physical and financial resources necessary for natural gas transmission activity performance. The company has the right to take decisions independently of the vertically integrated undertaking, with respect to the assets necessary to operate, maintain or develop the transmission network, as well as powers to propose binding for the general assembly decisions on raising funds in the capital market through borrowing increased capital. The activities of the transmission network operator Bulgartransgaz EAD are unbundled legally, functionally and financially from the other activities of the vertically integrated undertaking.

EWRC by Decision № C-4 of 22 June 2015 certified Bulgartransgaz EAD as an independent transmission operator (ITO) of the transmission system in Bulgaria and by Decision № C-6 of 5 Nov 2015 EWRC designated the same as Bulgarian ITO. The last decision was notified to the European Commission and the notification was published in the Official Journal of the European Union, issue C 428 of 19 December 2015.

4.1.2. Technical functioning

Bulgartransgaz EAD is a combined operator performing the activities of natural gas transmission and storage. The company holds licenses № JI-214-06 and № JI-214-09 of 29.11.2006 for the activity “natural gas transmission” and license № L-214-10 of 29.11.2006 for the activity “natural gas storage”. Bulgartransgaz EAD is the operator of the:

- national gas transmission network on the territory of Bulgaria transporting gas to the natural gas distribution networks and business customers;
- transit gas transmission network for gas transportation through Bulgaria to the neighbouring countries of Romania, Turkey, Greece and FYROM;
- underground gas storage facility Chiren (UGS Chiren) for the storage of natural gas primarily intended to cover seasonal fluctuation in demand and to ensure natural gas security of supply.

The transmission network operator ensures the unified management and reliable operation of the gas transmission network; the transmission via gas transmission network and its metering; the maintenance of gas transmission network facilities and equipment in accordance with the technical and safety requirements; the transmission network development in accordance with long-term forecasts and gas supply development plans and beyond them, where economically justified and ancillary networks maintenance and development. In order to ensure reliable, safe and efficient operation of its natural gas transmission networks and associated facilities and reliable transmission, Bulgartransgaz EAD performs its activities in accordance with the regulations, technical norms, applicable standards in this area and safety work rules, respecting European rules on environmental protection and transmission system development plans. Bulgartransgaz EAD by its Central Dispatching Division provides unified management, reliable operation and transmission of natural gas transmission system and its metering in compliance with the quality requirements.

To ensure the security and reliability of gas networks operation the independent transmission operator performs preventive activities in the gas transmission networks and related facilities.

The transmission system operator shall prepare a schedule of planned repairs and reconstruction of gas networks facilities, which contains data on the type of repairs, their expected duration, as well as alleged restrictions on natural gas transmission. The transmission system operator develops emergency situations procedures as well.

TSO provides preventive actions in time of accidents and emergency situations. To this end, it develops and implements an emergency plan for carrying out rescue and emergency recovering works in case of disasters, accidents and catastrophes, which is consistent with the Emergency Situations Action Plan approved by Order of the Minister of Energy – the competent authority under Regulation (EU) № 994/2010. In the event of crisis situations when the of transmission networks modes are disrupted, the operator acts according to the said Plan, developing and coordinating the regime schemes of the network operation, reporting and analysing all entry-exit boundary conditions (bids, pressure, volumes, etc.), the gas transmission networks status, weather forecast, neighbouring transmission systems status and inertness degree. It also manages the required human and technical resources for the technological process, maintaining readiness for emergency notification and emergency situations in Central Dispatching Division, operating regions, compressor stations and the underground gas storage facility.

In pursuance of Art.81d of EA and art.22 of Directive 2009/73 /EC the transmission network operator has developed the Ten-year network development plan for the period 2016-2025, following consultations with stakeholders, The Plan is consistent with the upcoming changes in production, consumption and exchanges with other countries. Investment plans for regional networks and networks within the European Union have been taken into account. In the TYNDP Bulgartransgaz EAD has foreseen investments in gas transmission infrastructure and in UGS Chiren. The Plan contains all the investments that have been decided to be

performed and the new investments to be made over the next three years, as well as a schedule for the investment projects implementation. By Decision № БП-54 of 18 Aug 2016 EWRC approved the TYNDP of Bulgartransgaz EAD for the period 2016-2025.

Bulgartransgaz EAD performs the transmission system and gas market balancing in accordance with Regulation (EU) № 312/2014, via the *Natural gas market rules, Rules on natural gas market balancing and Daily imbalance charge calculation methodology* and the approved by EWRC's decision interim measures: an alternative to a balancing platform, a temporary imbalance charge and a tolerance (allowed deviation).

4.1.3. Network and LNG tariff for connection and access

The adopted by EWRC *Methodology on pricing natural gas access and transmission in gas transmission networks, owned by Bulgartransgaz EAD* contains the terms and conditions on access and transmission pricing of natural gas through the national and transit transmission networks, owned by the company. The Methodology shall be applied for access and transmission pricing of natural gas through any of the transmission networks or transmission system. The Methodology ensures the pricing model on entry points/areas and exit points/areas separately, complying with the transparency pricing principles; price application in non-discriminatory manner to users of the respective networks; taking into account the need for integrity of the networks and their improvement; the reflection of actual costs required for the provision of natural gas transmission services and to include economically justified return on existing assets and new investments. The Methodology introduces price formation under “revenue cap” regulation. The tariff model is "entry-exit" in terms of pricing of gas transmission network access and transmission.

The adopted by EWRC amendments of the Methodology aim to ensure fair pricing based on objective and transparent criteria, for the set and charged prices of the “natural gas transmission” activity to be able cover effectively the costs incurred by the TSO and to promote TSO's financial stability. The main amendments are related to the definition of the regulatory period duration of 2-5 years, which corresponds to the company's “revenue cap” regulation method and the relevant provisions of Ordinance № 2 of 2013 on natural gas prices regulation (ONGPR). A special regulatory account mechanism has been introduced, which is in line with the EU applied practice of transmission operators' price regulation. The implementation of this mechanism is also in line with the requirements of the *Framework Guidelines on rules regarding harmonised transmission tariff structures for gas* adopted by Decision No 01/2013 of 29.11.2013 by the Agency for the Cooperation of Energy Regulators (ACER), as well the *Network code on harmonised transmission tariff structures for gas* (TAR NC). The regulatory account should record the difference between the revenue a TSO is entitled to receive on the basis of the applied regulatory regime and the revenue actually received during the same period, thus aiming at minimizing the differences between the allowed revenue requirements that a TSO should have based on the applicable regulatory regime and the actual revenue for the same period.

By Decision № И-20 of 30.06.2016 EWRC approved for Bulgartransgaz EAD prices of the existing transit interconnection points with adjacent transmission networks for: the service „interruptible transmission in the forward direction“ and the service „reverse flow transmission on commercial basis“.

Following the signed Interconnection Agreement between Bulgartransgaz EAD and DESFA S.A. for the connection of the gas transmission systems of Bulgaria and Greece, after the approval of prices of interruptible services and the virtual trade possibility, the first real deals have been concluded.

Deals have been also concluded in the IP Negru Voda 1/Kardam after the signed Interconnection Agreement between Bulgartransgaz EAD and the Romanian TSO Transgaz AD.

EWRC regulates the price formation of access and storage of natural gas storage facilities in compliance with EA, the Ordinance on natural gas prices regulation (ONGPR)

and the Guidelines on pricing access and storage of natural gas storage facilities, applying "rate of return on capital" regulation. Gas access and storage prices, which the operators of gas storage facilities, respectively a combined operator, offer for one and the same service to different customers under equivalent terms and conditions, ensure compliance with the principle of non-discrimination to all network users and at the same time the special characteristics of the national market are taken into account.

In case the gas distribution network operator provides access and use of gas facilities owned by non-household customers, this could be done, according to EA, after signing a contract and at a price defined through methodology approved by.

In the Ordinance amending Ordinance № 2 of 19.03.2013 (ONGPR) new art.11a was created, regulating costs compensation in public service obligation cases for more than one energy undertaking. In art.17 a supplement was introduced regulating the rules for the additional costs of the gas public provider resulting from the notification of natural gas amounts after the expiry of the contracts, to be bore by the person causing them. Art.24a and art.40a regulate the procedure for determining the types of services provided to customers related to the licensed activity and the approval of prices of these services.

The amendments aim at providing balance between the interests of energy undertakings and customers, as well as equal treatment among the different types of energy companies.

Prices of "natural gas distribution" and "natural gas supply by an end supplier" have been regulated under the "price cap" method, under art. 3 of Ordinance № 2 on natural gas price regulation. EWRC approves tariff structures by customers' groups, reflecting the allocated annual revenue requirements for the service for each consumer group, based on submitted cost service study. The existing tariff structures and prices for end customers of the gas distribution companies are differentiated depending on consumption (household and non-household), consumption evenness and unevenness and corresponding consumption.

EWRC adopted *Rules on natural gas market balancing* and *Daily imbalance charge calculation methodology*. The *Rules on natural gas market balancing* (prom.SG/99 of 13 Dec 2016) are of utmost importance for the establishment of conditions to open the market and to ensure unhindered access for all market participants, including new entrants by establishing transparent and fair market-based mechanisms for gas supply and transmission. They guarantee that network users shall be responsible for the balancing of their portfolios in order to minimize the need for the operator to undertake balancing activities. The *Daily imbalance charge calculation methodology* determines how to calculate the amount of daily imbalances and positive and negative imbalances prices, ensuring the formation of non-discriminatory charges for imbalances and creating incentives for the transmission system users in the territory of the country to efficiently balance their balance sheet portfolios.

Amendments adopted in *Ordinance № 4 on connecting to gas transmission and distribution networks* have been introduced in pursuance of Decision № 411 of the Council of Ministers of 19.05.2016 on Action plan with measures addressing the main problem areas impeding investments growth, approved by Decision № 617 of the Council of Ministers of 12.08.2015, aiming to optimize the terms for joining the networks of the technical infrastructure in Bulgaria, including connection to gas transmission and distribution networks. The amendments aim at achieving predictability and clarity in the investment process of connecting sites to the gas transmission network. Specific and shortened deadlines have been established in the connection procedures, within which the transmission operator shall coordinate projects (spatial plans and investment projects) for pipeline branches and connected sites and provide an opinion on the connection conditions and the draft connection agreement. The anticipated outcome of applying the Ordinance is to increase the transmission network operator' activities efficiency and the quality of services offered.

Under EA and ONGPR the Commission regulates connection prices of customers to the distribution networks, which are formed by customers groups according to the requested maximum capacity and pressure and the relevant eligible costs of the consumer group.

Transmission and distribution network connection prices of extraction pipeline networks, gas storage facilities, liquefied natural gas facilities, production units of gas from renewable sources, distribution networks and non-household customers outside the above groups are individual and include the actual construction cost of connection facilities of the undertaking network.

4.1.4. Cross-border issues

Under EA art.170, para.1, item 9 the transmission system operator has the duty to provide sufficient cross-border capacity aiming the European gas transmission infrastructure integration, satisfying all economically feasible and technically realistic capacity requests, keeping in mind the observance of gas supply security requirements.

Pursuant to art.27, para.1 of Regulation (EU) 984/2013, TSOs apply the Regulation by offering capacity by one or a limited number of joint web-based booking platforms at interconnection points.

In 2016 the Bulgarian gas transmission operator signed a contract for the use of the interconnection points of Bulgartransgaz EAD with the gas transmission systems of Greece and Romania, as well as for all exit points of the gas transmission network for booking capacity on the Regional booking platform RBP, in line with art.27, para.1 of Regulation (EU) 984/2013. After 1 Dec 2016 onwards, the capacity nomination and allocation, both at interconnection points and inner entry and exit points, shall be performed at the Regional booking platform RBP. The capacity booking platform ensures the booking of annual, quarterly, monthly, daily and intraday capacity products through the capacity allocation mechanisms applicable under the Regulation.

In relation to the *Rules on natural gas market balancing and Daily imbalance charge calculation methodology*, adopted by EWRC by Decision under Protocol № 227 of 30.11.2016 and in line with the requirements of Regulation 312/2014, since 3 Jan 2017 the developed by Bulgartransgaz EAD's experts Commercial dispatching platform (CDP). The platform shall provide for the submission, processing and validation of requests and corrective requests for transmission, allocation of quantities transported, provision of information on the balance status of network users and users' imbalances allocation. The platform provides the use of Virtual Trade Point (VTP) through which intangible products can be traded (title transfer).

Article 11, para.2 of *Rules for access to the gas transmission and/or gas distribution networks and storage facilities* also envisages mechanisms for allocating available capacity for each entry and exit point and for the network as a whole, as follows: proportional allocation, tender procedure and open inquiry (in case of a new gas infrastructure).

There was no physical congestion in the gas transmission network at national and cross-border level in 2016. The project capacity of the national gas transmission network is 8 billion m³ and the actual annual consumption in the country does not exceed 40% of the maximum allowed project consumption.

Pursuant to art.21, para.1 item 28 of EA, EWRC establishes cooperation on cross-border issues with regulatory authorities of other countries – EU Member states and with ACER and concludes cooperation agreements with NRAs.

Together with the Greek regulator RAE EWRC has approved the *Updated guidelines for management and allocation of capacity on the IGB INTERCONNECTOR according to paragraph 6 of art. 36 of Directive 2009/73 / EC*, Phase I: Invitation to interested parties to express interest in reserving capacity and Phase II: Invitation to parties expressed their interest in Phase I to express their interest in booking capacity in the IGB Interconnector.

According to the submitted company report on the results of the market test, which ended on 30.11.2016, five bidding offers were received, with the booked capacity amounting to 1.56bcm/y. In November 2016, a trilateral meeting was held in Athens, between representatives of EWRC, RAE and ICGB AD. Different options were discussed there for allocating unused capacity in IGB interconnector, in order to increase the economic viability

of the project by attracting a wider range of investors to engage financially in the implementation of the project.

In connection with the signed Agreement of cooperation with Romanian Energy Regulatory Authority (ANRE), a bilateral meeting between representatives of the two regulatory bodies was held in Bucharest, Romania. Natural Gas Division experts presented presentations on the harmonization of the regulatory framework in the natural gas sector in compliance with the European legislation and on the construction of gas interconnections in Bulgaria.

4.1.5. Compliance

The power of the Regulator under art.41, §1 d of the Directive is transposed in art.21, para.1, item 31 of EA, namely to comply with and implement any relevant legally binding decisions of ACER and EC.

Regarding Bulgartransgaz EAD in its role as a certified independent transmission operator, EWRC's powers to regulate its activities are stipulated in art.21, para.3 of EA. EWRC monitors also the obligation' performance of the ITO compliance officer to supervise the compliance programme implementation and to submit quarterly reports and an annual report in order to indicate the measures taken. It is evident from the reports by the compliance officer received in EWRC in 2016 that there were no irregularities in the compliance programme implementation. In pursuance of Art.81d of EA, EWRC monitors and assesses the implementation of the Ten-year network development plan developed by the transmission network operator following consultations with stakeholders. The Commission shall examine whether the Plan covers all investment needs identified during the consultation process, and whether it is consistent with the TYNDPs in the European Union. When the ITO fails to execute an investment, which, under the TYNDP is to be executed in the following three years, EWRC has the power to require the operator to make the investments, in case they are still needed and to provide their reimbursement through the network services prices, unless the failure is due to compelling reasons beyond the network operator's control.

4.2. Promoting competition

Under the Energy Act, a license is not required for the activity "natural gas trade", thus natural gas market is 100% opened. As per art.176, para.1 of EA, extractive industries or natural gas traders, on one hand, and the public provider, natural gas suppliers, storage facility operators, LNG operators, traders or customers - on the other, may enter into natural gas transactions with each other at freely negotiated prices.

Under art.180, para.1 of EA and the provisions of the *Rules for access to the gas transmission and/or gas distribution networks and storage facilities*, all customers have the right to choose a natural gas supplier, which is also guaranteed under the terms of the licenses for the activity "natural gas supply by end supplier".

By the end of 2016 there were no natural gas customers who had a natural gas supplier other than the end supplier. 0.03% of business customers switched their natural gas supplier.

In 2016, there were no customers connected to gas distribution networks that had switched their natural gas supplier at unregulated prices to a regulated price supplier.

4.2.1. Wholesale markets

Under the current "Energy Strategy of Bulgaria" and in accordance with Directive 2009/73/ EC and Regulation (EC) 715/2009, in 2016 gas sector in Bulgaria developed towards market liberalization.

Key gas market participants in the country are:

- Bulgartransgaz EAD – a combined gas operator, in charge of gas transmission and gas storage activities;
- Bulgargaz EAD – the gas public provider in Bulgaria, providing gas supplies at regulated by EWRC prices;

- Gas traders – concluding gas supply trades with the public provider, end suppliers, customers, other gas traders, extraction companies gas, storage undertakings and with the transmission/distribution network operators;

- Gas distribution companies - combine the activities “natural gas distribution” and “natural gas supply by end supplier” by supplying natural gas to customers connected to the respective distribution networks in the licensed territories. At the end of 2016 there were 24 licensed companies in the territory of the country. They serve 5 gas distribution regions (Danube, West, Thrace, Moesia and Dobrudja) and 80 municipalities outside these regions;

- Non-household customers connected to the gas transmission network.

Natural gas delivery and supply in the Republic of Bulgaria is carried out in a transmission network owned by Bulgartransgaz EAD and distribution networks owned by the respective distribution companies. In the transit gas pipeline owned by Bulgartransgaz EAD natural gas transmission is carried out to the territories of Greece, FYROM and Turkey.

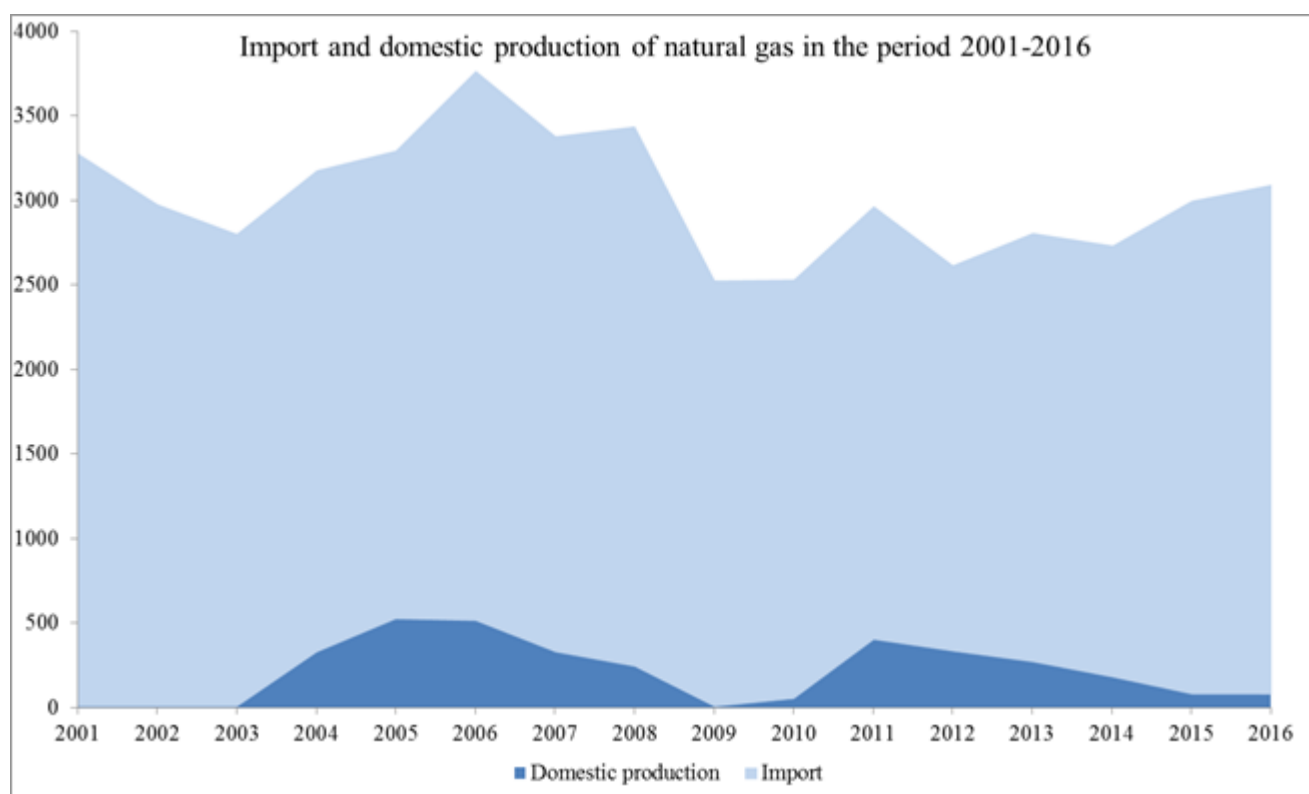
In 2016 gas supplies for the local market were carried out by the public provider Bulgargaz EAD, Petroceltic Ltd, Oil and Gas Exploration and Production AD and gas traders.

Bulgargaz EAD imports natural gas for the local market under the conditions of Contract № 02-12-13 of 15 Nov 2012 for gas supplies with OOO Gazprom Export.

Trends in the natural gas supplies for the local Bulgarian market in 2001-2016 are presented in tables and graphs below:

Natural gas imports and local production for the period 2001 – 2016 in million m³

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Import	3260	2958	2788	2848	2768	3249	3048	3190	2521	2480	2563	2281	2535	2551	2911	3014
Local extraction	18	19	13	329	528	517	333	246	9	54	406	336	274	182	85	80
Total	3278	2977	2801	3177	3296	3766	3381	3436	2530	2534	2969	2617	2809	2733	2996	3094

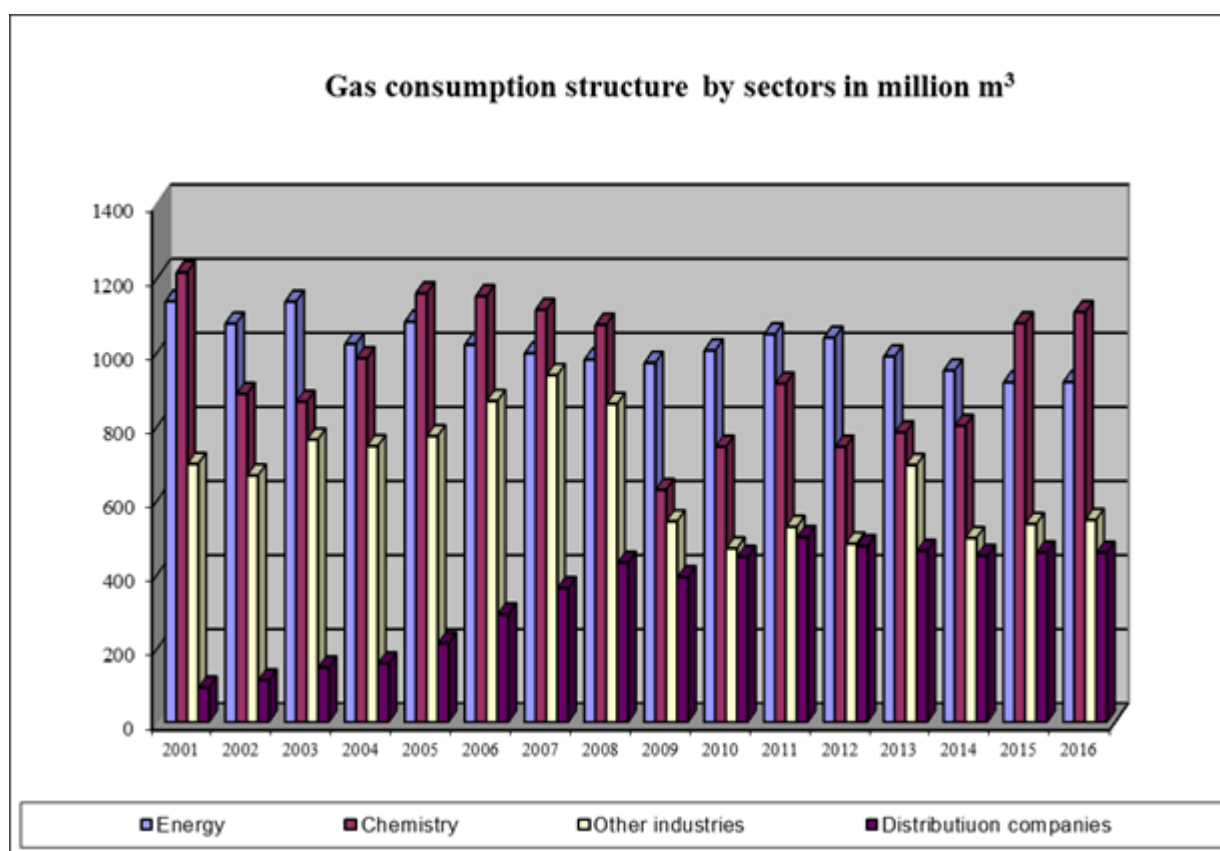


Quantities of realized natural gas in 2016 were 3028 million m³ and the consumption structure by sectors was the following:

- Energy sector – 918 million m³ or 30 %
- Chemical industry – 1107 million m³ or 37 %
- Other industries – 546 million m³ or 18 %
- Distribution companies – 457 million m³ or 15 %

Natural gas consumption structure by sectors in million m³

Year/consumer	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Energy	1136	1076	1135	1021	1081	1019	996	979	970	1003	1047	1038	987	949	917	918
Chemical industry	1214	886	865	982	1158	1150	1113	1073	627	743	914	743	782	800	1077	1107
Other industries	697	666	763	745	772	867	937	859	542	469	527	482	694	497	535	546
Distribution companies	93	113	147	158	212	291	362	430	391	446	499	475	462	449	458	457
Total	3140	2741	2910	2906	3223	3327	3408	3341	2530	2661	2987	2738	2925	2695	2987	3028

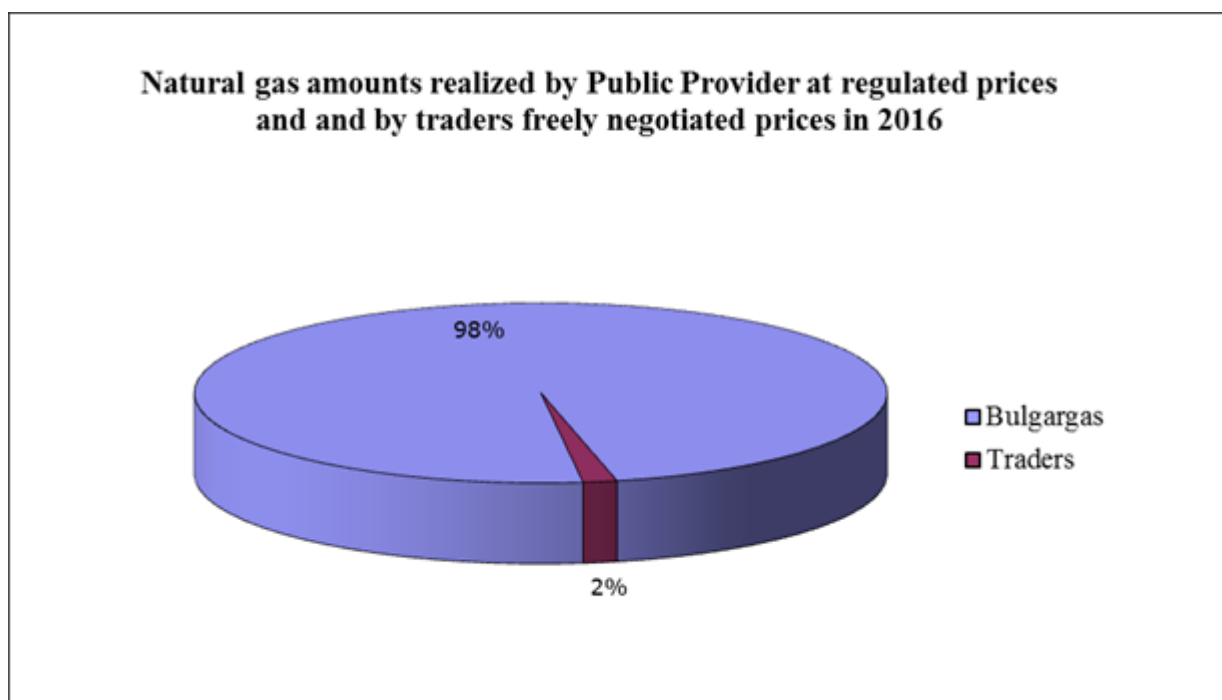


Natural gas consumption dynamics in Bulgaria in the period 2001 – 2016 in million m³

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Consumption	3140	2741	2910	2906	3223	3327	3408	3341	2530	2661	2987	2738	2925	2695	2987	3028

The public provider Bulgargaz EAD sells natural gas at regulated by EWRC prices and its share in the natural gas sale in 2016 was 98%. The remaining 2% were realized by traders. The following chart presents the ratio of the natural gas quantity sold by the Public Provider at regulated prices (to customers and gas distribution companies connected to the gas

transmission network) and by traders at freely negotiated prices - to end customers and gas distribution companies.



Natural gas transmission in the national transmission network

In 2016 the main users of the “natural gas transmission” service in gas transmission and distribution networks in the country were the public provider Bulgargaz EAD, extraction companies and traders. Natural gas supply to consumers in the Republic of Bulgaria is carried out mainly via the national gas transmission network, a complex facility consisting of 1835 km gas pipelines and high pressure gas branches, three compressor stations with total installed capacity 58 MW, gas regulation stations, metering stations, electrochemical protection systems, communication system, information system and other auxiliary facilities. The natural gas transmission network has sufficient capacity to meet current natural gas demand and by 2016 about 40% of the system’s maximum technical capacity has been used. Natural gas transported in the national transmission network is provided by imports from Russia (approximately 97.4%) and local production (approximately 2.6%). There is an increase of 4.51% of transported natural gas quantities in 2016 compared to the quantities realized in 2015.

Natural gas transit transmission

Bulgartransgaz EAD performs natural gas transit through the territory of the Republic of Bulgaria to neighbouring countries - Turkey, Greece and FYROM. Quantitative and qualitative analysis of natural gas inflows in the transit direction is performed in gas metering stations Negru Voda 2 and 3. The transmission of natural gas by transmission directions is realized respectively at Malkochlar GMS for Turkey, Strimonohori GMS for Greece and Zhidilovo GMS for FYROM.

In 2016 Bulgartransgaz EAD opened the reconstructed and modernized Lozenets, Strandzha, Petrich and Ihtiman stations, through which natural gas transit flows are directed to Turkey and Greece.

In 2016 transit volumes transported through the transmission network were 14 619.890 million m³ or by 8.25% more than those in 2015 (13 505.094 million m³) and an increase in all three directions (Turkey, Greece and FYROM) is observed. In 2016 gas quantities transited were as follows: Turkey 11 730.488 million m³ or 3.02% more compared to 2015; Greece 2 675.773 million m³ or 35% more compared to 2015; FYROM 213.629 million m³ or 56.56% more compared to 2015.

Natural gas storage

Natural gas storage activity is performed in the only one in the country underground gas storage facility Chiren (Chiren UGS), owned by Bulgartransgaz EAD. Technological process associated with the natural gas storage activity is a seasonal (cyclical) one and represents injecting gas from/to the underground gas storage. In 2016 364.959 million m³ were withdrawn and 342.279 million m³ injected and they include the virtually withdrawn and injected gas. Actual quantities in 2016 were 342.159 million m³ or an increase by 21.20% compared to 2015. Actual injected quantities in the UGS in 2016 were 319.478 million m³ or an increase of 12.29% compared to 2015.

4.2.2. Retail market

Natural gas supplies in the Republic of Bulgaria is carried out in a transmission network owned by Bulgartransgaz EAD for customers, directly connected to the transmission network, and in distribution networks owned by the respective distribution companies. The needed natural gas distribution infrastructure in the country is still in process of construction and household consumers connected to the natural gas distribution network are few. Household consumption is very low - 2.28 % of the total consumption in the country. EWRC applies a regulatory mechanism, which ensures incentives for the natural gas distribution enterprises to continue the development of the networks and the connection of new consumers aiming the increase of consumption. One of the incentives enhancing market competition is that EWRC approves marginal prices for the gas sale and the gas distribution companies have the right to sell to consumers at prices lower than the approved, which promotes market competition.

Monitoring the natural gas market stimulates retail competition. EWRC permanently monitors the market with the view to ensure non-discrimination between all market participants, as well as between participants of one and the same category and to promote efficient competition and proper market operation. Regarding the latter, when exercising its controlling powers, EWRC carries out scheduled inspections of the energy companies, as well as surprise inspections in case of filed complaints and signals.

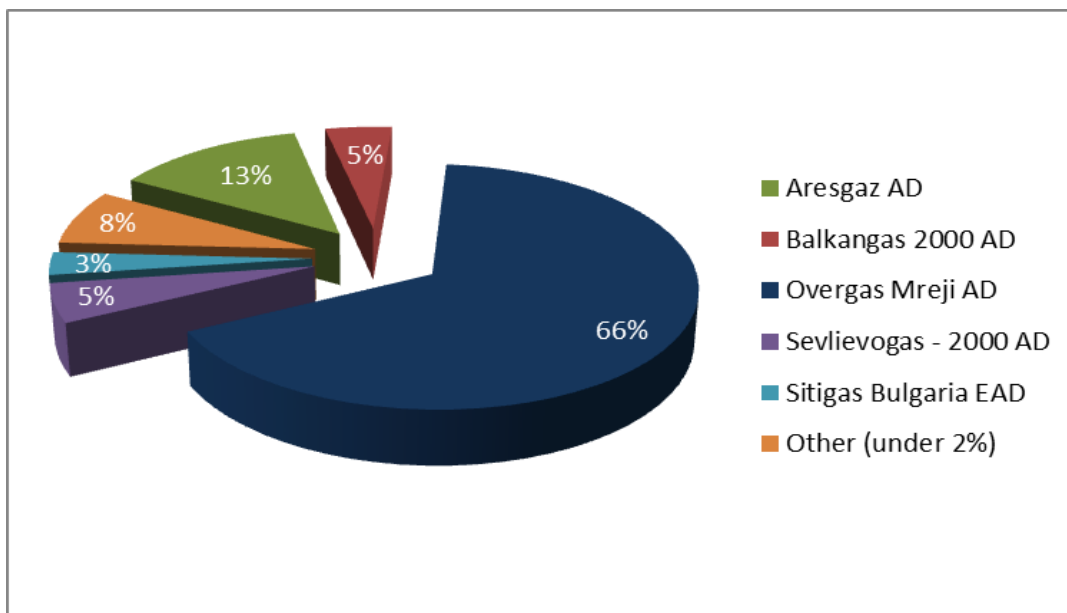
The Commission monitors and inspects the gas distribution companies regarding the compliance of the set in their approved business plans parameters connected with their duties under the licenses for the activities of natural gas distribution and supply by end supplier.

Gas distribution companies' activity results for 2016 are given below:

Parameter	Constructed network in 2016	Investment 2016	Number of consumers (accumulative) as of 31 Dec 2016		Natural gas consumed, thousand norm m ³ 2016	
Gas distribution companies	m	Thousand BGN	Non-households	Households	Non-households	Households
Total	110 291	19 370	6 573	80 697	410 645	76 051

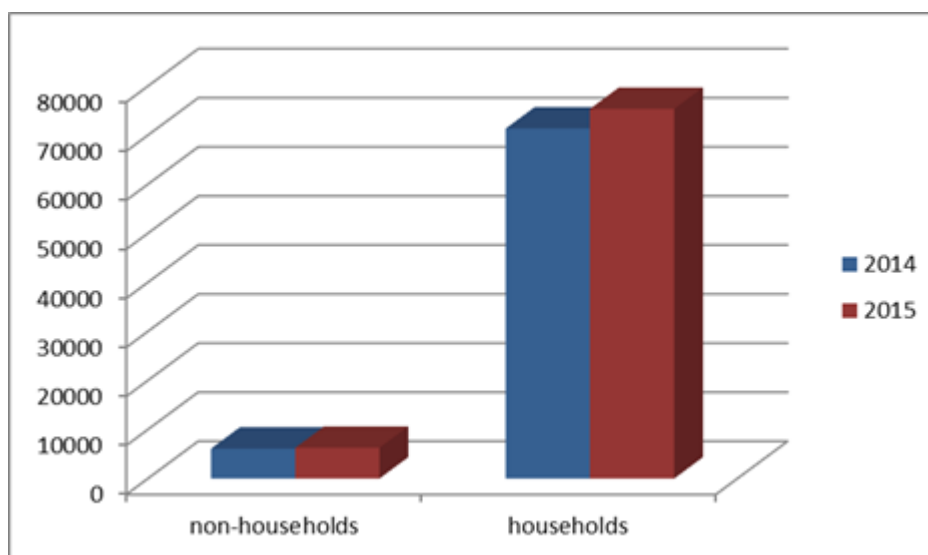
According to data of distribution companies, total number of natural gas customers in 2016 was 87 270, 80 697 (92%) of them households and 6 573 (8%) non-household customers.

The breakdown of natural gas consumers by companies' share in servicing them is shown in the graph below:



Overgas Mrezhi AD serves most of the customers – 57 816, which is 66% of all natural gas consumers in the country, followed by Aresgaz AD with 13% and Sevlievogaz - 2000 AD with 5%. The value of Herfindahl-Hirschmann index, which is a commonly accepted measure of market concentration and monopoly existence in terms of natural gas supplied by gas distribution companies to household consumers in Bulgaria, is 4935 and shows high market concentration. The index is indicated for calculation in the annual gas indicators of CEER.

The number of customers (household and non-household) of gas distribution companies in 2016 rose from 81 620 in 2015 to 87 270, which is almost 7% increase per year. The number of household customers increased by more than 7% and of non-household - almost 5%.



The relatively low rate of increase in the number of non-household customers during the year was mainly due to the almost fulfilled connection potential of non-household customers in the gas distribution network. The increase potential of non-household customers is low, since non-gasified objects are mainly small and their transition to natural gas is estimated as inefficient, due to the very high initial investment. For the same reason, although with much higher potential, the household gasification development is slow and rapid increase in the potential fulfilment of the network cannot be expected.

4.2.3. Recommendation on supply prices, investigations and measures to promote effective competition

In the past 2016 the Bulgarian regulatory authority did not give any recommendations concerning the prices of the supplied natural gas. However, EWRC published information on the approved actual marginal prices.

The provision of Article 30, para.2 of EA stipulates that the prices of electricity, natural gas and services provided by energy companies are not subject to regulation by EWRC when the later finds out the existence of competition, which creates pre-conditions for the free negotiation of prices under market conditions for each energy sector activity. In this respect, as far as natural gas sector is concerned, pre-conditions for the existence of competition in the market are provided by the legislature through the provision of art.180, para.1 of EA: “Every customer connected to the gas transmission and/or gas distribution network may choose a natural gas supplier, regardless of the European Union member state in which the supplier is registered, provided the supplier complies with the rules under art.173, para.1 and the security of supply requirements”.

In line with art.181 of EA, natural gas contracts are concluded at regulated by the Commission prices for services of public interest regarding transmission, distribution and supply and at freely negotiated prices among the parties – prices outside the public interest services.

To achieve the existence of competition, which is a prerequisite for free negotiation of electricity and natural gas prices at market conditions, an effective market opening is needed, an establishment of a single EU natural gas market, which is in the interest of citizens and industry. This can be achieved through implementation of interconnection projects, which will enable natural gas supply from other sources and will increase competition and the possibilities to choose a supplier. The interconnection projects are a priority for Bulgaria and have significant influence regarding security of supply in the region.

4.3. Security of supply

Pursuant to art.4, para.2, item 4a of EA, the Ministry of energy is the competent authority concerning security of supply in the meaning of Regulation (EC) 994/2010. In line with art.72 a of EA, the Minister of energy, after consultations with natural gas companies and organizations representing household and non-household customers’ interests and with EWRC, implements at national level:

1. Preventive action plan containing the measures needed for the removal or limitation of the identified risks impact in compliance with the risk assessment.

2. Emergency action plan containing the measures needed for the removal or mitigation of natural gas supply interruption impact.

EWRC participates with its representatives in an interdepartmental working group established by the Minister of Energy, which updates these documents and the risk assessment in accordance with Art.5, paragraph 4, Art.9, paragraph 4 and article 10, paragraph 2 of Regulation (EC) № 994/2010 of the European Parliament and of the Council of 20 October 2010 concerning the measures to safeguard security of gas supply.

4.3.1. Monitoring balance of supply and demand

In 2016 Bulgargaz EAD purchased natural gas from Gazprom Export OOO on the basis of a contract. The local production share for domestic needs was provided by Petroceltic EOOD and Oil and Gas Exploration and Production AD.

4.3.2. Measures to cover peak demand or shortfalls of suppliers

In 2016 the national gas transmission network operated considerably under the project capacity, as only 3.4 billion m³ were transported, which represents about 40% of the project

capacity (8 billion m³). Gas distribution networks are relatively new and most of them are loaded also significantly under their project capacity.

Bulgargaz EAD provides gas for its clients (end suppliers and non-households connected to the transmission network) on the basis of a contract with Gazprom Export OOO. A major part of the end suppliers provide natural gas quantities to their customers, connected to the gas distribution networks under gas supply contracts with Bulgargaz EAD.

In the approved by EWRC TYNDP of Bulgartransgaz EAD for the period 2016- 2025 a scenario has been presented concerning capacity search and sources to cover natural gas demand in Bulgaria for the period 2016-2025, taking into consideration: forecast of the expected natural gas demand for a period of one year and peak demand levels per day; sources to meet the demand in the country with forecasts for the period 2016-2020; forecast of capacity search for cross-border transmission through the infrastructure of Bulgartransgaz EAD. Measures to safeguard security of natural gas supplies were described, including risk assessment and N-1 formula under Regulation (EC) № 994/2010, which describes the ability of the gas infrastructure technical capacity to satisfy total natural gas demand in the calculated area in case of disruption of the largest single gas infrastructure on a day with exceptionally high demand occurring with a probability of once in 20 years. In case of such disruption, the capacity of the remaining infrastructure should be able to deliver the necessary gas amounts in order to satisfy gas demand in the area. Two key scenarios have been developed to meet the requirements on infrastructure standard at N-1 formula, namely: a base scenario (existing and forthcoming to be put into operation till 01.01.2017) and a target scenario (construction and commissioning of projects of common interest, as well as new domestic extraction fields). Calculations with the base scenario illustrate that in case of disruption of the largest single gas infrastructure (from Russia through Ukraine), the capacity of the existing infrastructure is not able to deliver the necessary gas amounts to satisfy total gas demand in the territory of Bulgaria for a day of exceptionally high gas demand. At the same time, the analysis shows that with the implementation of the PCI projects Bulgaria will fulfil the infrastructure standard by 2017. In order to achieve the infrastructure standard approved in the TYNDP of Bulgartransgaz EAD for the period 2016- 2025, several major projects have been envisaged - namely modernization of the national gas infrastructure, including modernization of compressor stations and projects for the construction of gas interconnections.

Investments foreseen for the period 2016- 2025 shall facilitate to reach Increasing and ensuring technical security, safety and reliability of the gas infrastructure and to comply with environmental protection requirements in order to meet the expected growing gas demand in the country and in the region, through: investments in reconstruction, rehabilitation and transmission networks' repairs, including investments in existing compressor stations; investments in existing linear infrastructure; investments in existing gas regulation and measuring stations and UGS Chiren; investments in new facilities construction in addition to the existing infrastructure needed to increase the efficiency of operations; investment in ancillary infrastructure, including fibre network.

Investments shall ensure the security of gas supplies to the country through: investments in interconnections to provide connectivity with other transmission networks; investments in the expansion of the underground gas storage, of the extraction and injection facilities and to increase opportunities for the storage of larger gas amounts.

Measures to cover peak demand or shortage of suppliers are:

Network configuration, real gas flows, including possibilities of physical flows in both directions - there are possibilities for reverse physical flow of natural gas from Greece and Turkey (2.4 million m³/day in the event of complete Russian gas supplies interruption). Reverse flow from Greece was realized at the end of January 2009 gas crisis, based on signed agreement;

- Natural gas storage - the amounts stored in UGS Chiren are intended mainly for compensating the uneven consumption as well as for guaranteeing security of supplies in the event of deficit. The storage facility has 23 exploitation wells, a compressor station with a

total installed capacity of 10 MW and other facilities required to secure the injection and withdrawal as well as to the quality of the stored gas. The current storage capacity can provide 550 mcm natural gas.

Realizing the investment envisaged aims at opportunity for competitive market development and diversification of natural gas supply sources and routes, resulting in greater energy independence; it will enable local traders to access the gas at various prices and the possibility of creating a regional gas exchange, including spot market by building the facilities necessary to connect to the existing transmission infrastructure with future trans-European gas corridors South Stream and with Southern Gas Corridor projects - Trans-Anatolian pipeline (TANAP), Trans-Adriatic Pipeline (TAP), as well as other pan-European projects intended to provide diversification of natural gas supply sources and gas transportation routes to Europe; connection of the gas production network of extraction enterprises in the country; development and implementation of electronic systems to manage the activities.

Projects crucial to the process of liberalization, diversification of natural gas supply sources and routes and gas network development in the region, with a view to ensuring continuity and security of natural gas supply, are:

Gas Interconnection Greece - Bulgaria (IGB) has been enlisted in the Projects of Common Interest under Regulation 347/2013 and is the first in the list of priority projects under the Interconnection Initiative between the Central and Southeast European Countries CESEC. The project is co-financed by the “European Energy Programme for Recovery” in the form of grants. A mandate has been signed with the European Bank for Reconstruction and Development to start negotiations of financing the construction phase. The implementation of the project envisages a state guarantee, which was successively renewed in 2015, 2016 and 2017, the current amount of which is BGN 220 million. According to the current schedule, the construction is expected to begin in the first quarter of 2018 and the project will be commissioned in early 2020.

Regarding the project implementation, EWRC approved *Updated Guidelines for the management and allocation of interconnection capacity of the gas interconnection Bulgaria - Greece (IGB)* and *Notice of participation* according to art.36 of Directive 2009/73/EC - Phase I - Invitation to stakeholders to express interest in reserving capacity, as well as a *Notice of participation* in Phase II: Invitation to participants in Phase I to express their interest in booking capacity in interconnection IGB.

The Market test was completed on 30.11.2016. According to the information in the submitted by the company report on the results of the market test, five bidding offers were received, with the booked capacity amounting to 1.56bcm/y. In November 2016, a trilateral meeting was held in Athens, between representatives of EWRC, RAE and ICGB AD. ICGB AD shareholders expressed their intention to carry out a procedure for allocating unused capacity in IGB interconnector, held in the same non-discriminatory and transparent manner as the two phases of the market test, but with an adapted shortened timeframe. Representatives of the two regulators expressed a favourable opinion on the conduct of such a procedure, given the need to increase the economic viability of the project by attracting a wider range of investors to engage financially in the implementation of the project.

By Decision under Protocol № 247, p.2 of 27.12.2016 EWRC approved opinion concerning the proposed by ICGB AD preliminary capacity allocation, contained in a report on the Bidding Phase for IGB project held from 1 September to 30 November 2016.

Gas Interconnection Bulgaria - Serbia (IBS) aims to connect the national gas transmission networks of Bulgaria and Serbia. The Interconnection is one of the Bulgarian gas projects included in the PCI list under Regulation (EU) № 347/2013 is implemented by the Ministry of energy, as a beneficiary under a procedure of direct grant under the Operational Programme “Development of the Competitiveness of the Bulgarian Economy 2007 - 2013” for activities included in the first phase of the project. According to preliminary technical information the route Sofia - Dimitrovgrad - Nish is about 170 km, of which 62.2 km on Bulgarian territory, and the connection point of the pipeline to the gas transmission network

of Bulgartransgaz EAD is in Novi Iskar area. Projected annual minimum capacity is about 1.8 billion m³ and the maximum is 3.2 billion m³. The construction will be implemented and financed by the Operational Programme “Innovation and Competitiveness 2014-2020”. Deadline for commissioning of the project is end of 2020.

Realization of the project shall enable the gas transmission to Serbia using the planned new entry points with Turkey and Greece and the significant free capacity of the transmission network. Concurrently, in crisis situations the interconnector can be used for gas supplies from Serbia.

Gas Interconnection Bulgaria - Turkey (ITB) is a system interconnection development project for connection of the gas transmission networks of Bulgartransgaz EAD and Botash C.A. – Turkey that will provide an opportunity for diversification of natural gas supply sources, shippers and routes, thereby enhancing security of supply in the region and competition development. ITB is a new overland pipeline with a length of about 200 km (approximately 75 km of which on Bulgarian territory), with a capacity of 3 billion m³/y. The Interconnection Bulgaria - Turkey has been ranked in the list of Projects of common Interest of the European Commission under Regulation (EU) № 347/2013. Grant financing has been received under the EC “Connecting Europe Facility” (CEF-Energy) for the implementation of the feasibility study in 2015 at the amount of € 190 000. A comprehensive feasibility study of the Turkey-Bulgaria Interconnection project was carried out in 2016, recommendations were made for choosing a gas pipeline, technical studies, cost assessment, market needs assessment and analysis, cost-benefit analysis, ex-ante impact assessment of environmental and social impacts, project development schedule, technical design assignment, risk assessment, etc. The estimated timeline for the construction and commissioning of ITB is 2020.

Eastring Project - Bulgaria is a subproject of the Eastring cluster project – a project for the construction of a transport corridor through the territory of Slovakia, Hungary, Romania and Bulgaria, providing possibilities for two-way natural gas supplies from alternative sources. Eastring concept, as developed so far and included in the ENTSO-G TYNDP 2017 - 2026, is envisaged to be developed jointly and in coordination between the TSOs of Slovakia, Hungary, Romania and Bulgaria.

Bulgartransgaz EAD is responsible for the implementation of the Bulgarian section of the project. Regarding the territory of Bulgaria for the first stage of the project it is planned to build a new gas pipeline with a length of about 257 km between a new entry/exit point at the Bulgarian-Romanian border and a new entry/exit point at an external EU border in Bulgaria, as well as the construction of new compressor capacities of 88-90 MW. The second stage of the project envisages additional construction of new compressor capacities. There is a foreseen possibility for Eastring to connect with the Bulgartransgaz EAD networks with input/output capacity of 200 GWh/d.

For the purpose of the project implementation, in June 2016, Bulgartransgaz EAD and Eustream signed a Memorandum of Understanding, according to which the two parties will cooperate in analysing the gas markets development prospects, which analysis must establish the expected capacity in the Eastring pipeline. In July 2016, a Memorandum of Understanding on Eastring between the Ministry of Energy of Bulgaria and the Ministry of Economy of Slovakia was signed in Bratislava. A feasibility study for the Eastring project is due to take place. It will be implemented with the financial support of the Connecting Europe Facility (CEF) in connection with a decision taken within CEF Call 2016-2.

Regional gas hub Balkan relates to the gas infrastructure development in the territory of Bulgaria. concept based on the idea that significant natural gas amounts from various sources to enter the country in a certain real physical point near the Varna city for further transportation, while in this same location a market place (hub) to be organized for gas trade - where all market participants could carry out gas transactions at market principles. The idea of a gas hub construction was supported by the strategic geographic location of Bulgaria, the well-developed existing gas transmission and storage infrastructure, as well as by the

interconnection projects with Turkey, Greece and Serbia and completing the infrastructure with Romania.

The concept of building Balkan gas hub is included in the PCI under Regulation (EU) No 347/2013. The project is listed under PCI 6.25.4 in cluster 6.25, which includes alternative projects for the supply of natural gas from new sources and new routes to Central, Eastern and South-eastern Europe.

Balkan gas hub concept includes several key elements that form the project as a whole:

- New gas sources;
- Optimal use of the existing gas transmission networks and Chiren UGS;
- Modernization and extension of existing infrastructure;
- New gas hub infrastructure.

In connection with the need for a detailed feasibility study, a grant of EUR 920 500 was approved under the Connecting Europe Facility (CEF Call 2016-2) for “Feasibility study for Balkan gas hub project”.

5. CONSUMER PROTECTION AND DISPUTE SETTLEMENT IN THE ELECTRICITY AND GAS SECTORS

5.1. Consumer protection

5.1.1. Electricity

Pursuant to the requirements of Art.37 (1) (n) of Directive 2009/72/EC to ensure quick access and provision of data on customer consumption, commercial metering devices, including the devices ruling the tariffs, are located in a way that the consumer has the opportunity to observe the figures displayed in the commercial metering devices. In cases where it is needed to guarantee the life and health of citizens, property, power quality, continuity of supply and security and reliability of the energy system, commercial metering devices are put in a place with difficult access, the electricity distribution company shall be obliged to provide at its own account the possibility of visual inspection within three (3) days following a written request. The same obligation has been imposed on licensed companies in the natural gas sector under approved by EWRC general conditions. In addition, energy companies have established in every major city of their licensed territory customer service centres and have their own internet sites for each user to have an access to them.

Under EA amendments, Section VI defines (Measures to protect end consumers), in pursuance of the requirement of Art.37 (1) (n) of Directive 2009/72/EC, the energy companies' obligations to provide information to their customers regarding:

- actually consumed quantities and service provided value in accordance with the contracted readings periodicity with no obligation of additional payment for this service;
- conditions on the provision of electronic billing information and electronic invoices;
- electricity or natural gas supplier provides another electricity or natural gas supplier with the consumption data of a household consumer when such action has been provided for in an express agreement between the consumer and the electricity or natural gas supplier.

These provisions ensure customer access to energy consumption data, their providing in an easily understandable format and use. Customers have their consumption data and may, by an agreement and without additional costs, provide these data to any licensed supply company, thus transposing the requirements of Annex I, letter h of Directive 2009/72/ EC.

5.1.2. Natural gas

In exercising its regulatory powers, the Commission shall be guided by defined in the Energy Act (EA) general principles, including ensuring a balance between the interests of energy companies and customers, equality between different categories of energy companies and between consumer types and to establish end customers protection measures (Art. 23 items 4, 5 and 12 of EA). To protect energy companies customers' rights EWRC closely cooperates with the Consumer Protection Commission, the Ombudsman of the Republic of Bulgaria, as well as a number of consumer protection NGOs.

As a specialized state body EWRC regulates the activities in the energy sector, approves the General conditions of contracts provided for in EA and the Rules on work with energy services consumers developed by energy companies that provide services of public interest. This type of contracts has a regulated by EA mandatory content, which ensures consumers' rights. Licensees providing services of public interest are obliged to guarantee consumers' rights protection and equality between customer groups in the contracts General conditions and in the Rules on work with energy services consumers.

By the amendments of EA, promulgated SG, 54 of 17.07.2012, and transposing the requirements of Directive 2009/73/ EC, enhance and guarantee the existing consumer rights and include greater transparency regarding their energy rights, particularly in the gas sector. The amendments introduce compulsory content of the energy services contracts; they indicate the information that energy companies (contract parties) should provide for their clients and the ways that should be done; a requirement for the energy companies has been introduced to establish centers for providing information to energy service users and to work with them in accordance with the *Rules on work with energy services consumers*. EA requires energy companies providing services of public interest to determine in the general conditions for supply and use of networks and in the *Rules for working with users of energy services*, special procedures on provision of information to vulnerable customers related to their consumption and energy discontinuing.

In 2015, with the EA amendments, promulgated SG, 17 of 6 March 2015 and SG, 35 of 15 May 2015, new provisions have been supplemented concerning measures to protect energy services consumers, aimed at ensuring effective and adequate protection of their rights. Provisions have been supplemented and refined concerning end-user protection measures included compulsorily in the energy services contracts. EA requires energy companies to provide information, including on actual quantities consumed and value of the service provided, payment methods, prices of disconnection and activation of supply, prices of maintenance services and other prices of services related to the licensed activity; supplier switching procedure, to notify their household customers of any proposed change in the contractual terms and prices of services provided, as well as consumer right unilaterally to terminate the contract within 30 days of the date of notification, if they did not accept the new terms and conditions and/or prices. In this regard, § 42 para.1 of the Transitional and Final Provisions of the Act amending the EA (prom SG, 17 of 2015, effective as of 6 March 2015) provides for end suppliers of natural gas and distribution system operators to submit a proposal to the Commission of amending the terms and conditions of the contracts in accordance with the EA amendments. EWRC is in a process of approving: General conditions of contracts for natural gas supply by end supplier under art.183a of EA; Terms and conditions of contracts for natural gas transmission in distribution networks under art.183b of EA; Rules for working with users of energy services.

EA requires energy companies providing services of public interest to determine in the general conditions for supply and use of networks and in the Rules for working with users of energy services, special procedures on provision of information to vulnerable customers related to their consumption and energy discontinuing. According to companies reporting registered vulnerable customers in 2016 were 4.

EWRC monitors the energy companies' obligations on providing information to the customers and in regard to their work with them, as well as the submitted annual reported data on the activities and by on-site inspections.

5.2. Dispute settlement

Disputes settlement term and conditions are regulated by EA and Ordinance №3 on licensing the activities in the energy sector. EWRC handles complaints of:

1. networks and facilities users against transmission and distribution network operators, extraction companies, natural gas storage facilities operators and LNG operators related to the way these entities perform their duties under EA and users against W&S operators related to regulatory issues under the Water Supply and Sewerage Services Regulation Act;
2. customers against electricity and natural gas suppliers, including end suppliers regarding their duties performance under EA;
3. licensees against other licensees regarding their duties performance under EA, as well as W&S operators against W&S operators related to regulatory issues under the Water Supply and Sewerage Services Regulation Act.

Within two months of lodging a complaint under item 1, 2 and 3, EWRC may assist an amicable dispute settlement. The term may be extended by another two months if the nature of the dispute requires collecting additional data and information by EWRC. The procedure is voluntary and confidential. Under the amicable disputes settlement EWRC does not make a ruling/decision and the procedure ends with an agreement. It involves the dispute parties and a conciliator - a member of the EWRC working group that has been designated to handle the complaint. The conciliator uses all reasonable means and efforts to resolve the dispute by proposing to the parties a resolution and if consent is achieved - to draft a written agreement.

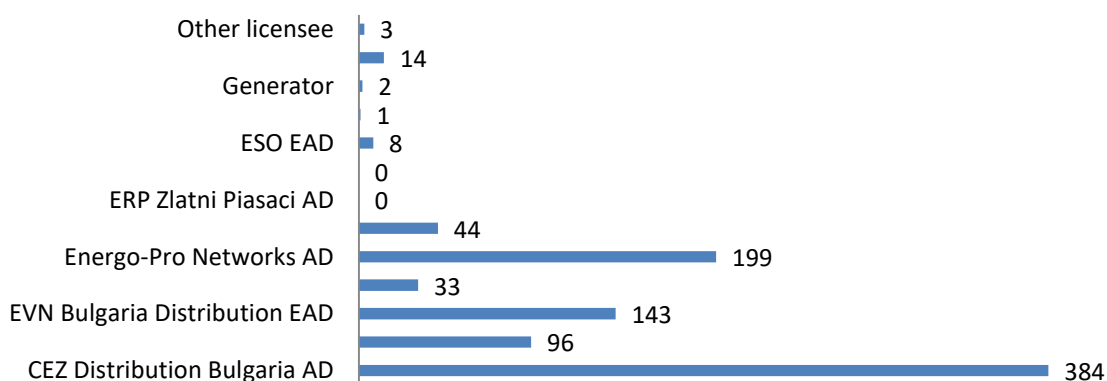
In case no amicable settlement is achieved or the parties reject amicable settlement, the Commission shall decide on the complaint within two months after receiving it. This period may be extended by another two months if the nature of the dispute requires the Commission to collect additional data and information. Upon complainant consent the extended period may be extended again by another two months. When EWRC finds a complaint being justified, it issues a decision with binding guidelines on the implementation of the law. Commission decisions are subject to appeal before the Administrative Court - Sofia City under the Administrative Code.

Under the legislation, EWRC has the power to fulfil the obligations set out in Directive 2009/72/C and Directive 2009/73/EC, namely to act as a dispute settlement body in respect of any complaint against transmission or distribution operator in relation to that operator's obligations and to issue a decision within two months of the complaint receipt. The decisions of the regulatory authority shall have binding effect unless and until overruled on appeal.

5.2.1. Electricity sector

In 2016 the total number of electricity applications filed in EWRC was 997. 931 of them were under the provisions of art.22, para.1 of EA, thus considered as complaints. In 6 cases complaints were against companies not licensees of EWRC.

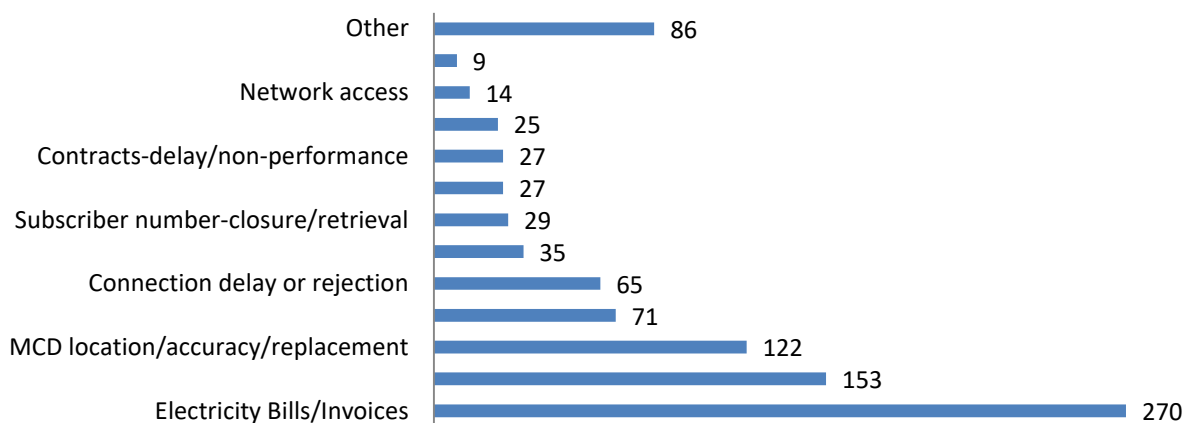
Complaints breakdown against different companies in the electricity sector



The largest number of complaints are alleged doubts about the accuracy of the commercial metering devices, improperly calculated amounts of electricity consumed in detecting unlawful use of such electricity, - unlawful power failure.

Complaints breakdown according to their subject is presented in the following chart:

Complaints breakdown in the electricity sector according to their subject



As can be seen from the above chart, other causes of complaints and signals are:

- deteriorated indices of the quality of electricity in whole settlements – too low voltage in the connection point, frequent power cuts, damage to electrical appliances;
- untimely or inaccurate metering of the electricity consumed, installation of commercial metering devices at great distance from the site and their replacement without prior notice;
- unnecessary power interruption and prior notification;
- delayed or refused connection of new generation and consumer sites;
- poor condition of the distribution network elements and necessity of electrical equipment displacement;

- recovering unlawfully closed accounts and terminating contracts of access to the electricity distribution network;
- purchase of energy facilities by customers from the distribution companies;
- failure to perform contractual relations or change of the connection conditions for consumers and generators sites to the electricity distribution or transmission grid;
- consumers and generators access to the open electricity market;
- RES or hi-tech generated energy purchase;
- others.

EWRC had 76 decisions on complaints in the period 01.01.2016 - 31.12.2016, as follows:

- 31 with mandatory instructions;
- 28 for termination due to unfoundedness;
- 13 for termination due to failing legal interest;
- 4 for termination due to inadmissibility.

In order to clarify the complaints facts and circumstances, which could not be clarified in a documentary way, 20 on-site inspections were made at electricity distribution companies: 9 at Energo-Pro Grids AD, 9 at CEZ Distribution Bulgaria AD and 2 at EVN Bulgaria Electricity Distribution EAD. The on-site inspections were mainly focused on resolving disputes between customers and network operators regarding distribution network connection conditions and supplied electricity quality.

In order to further clarify the submitted at EWRC complaints circumstances, ten tripartite meetings were held. A procedure of amicable dispute settlement between Kaliakra Wind Power AD and ESO EAD had been initiated.

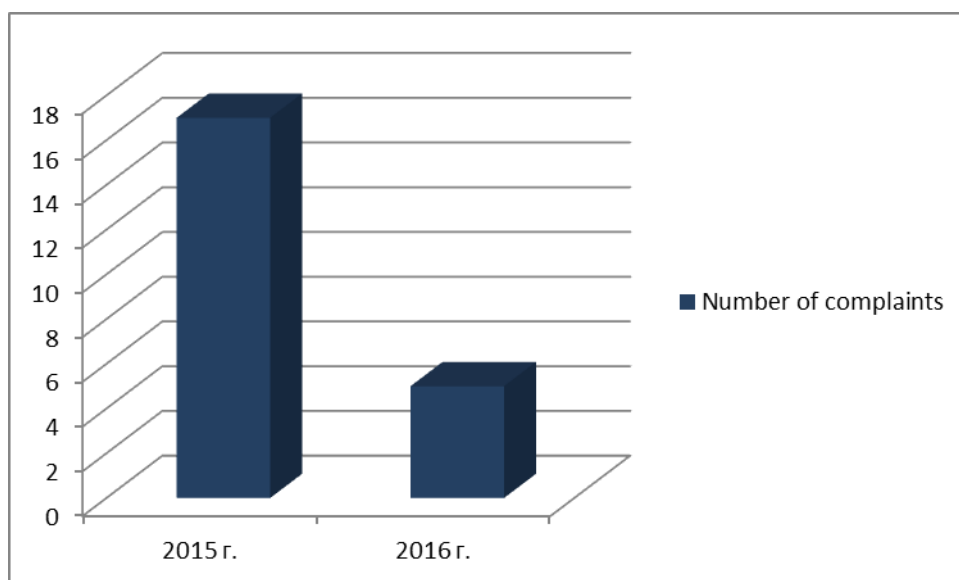
Holding tripartite meetings has a positive impact on the parties in dispute, reduces the time to clarify the circumstances and helps to solve the problems more quickly.

5.2.2. Natural gas sector

In 2016, 20 inquiries and complaints were submitted at EWRC, of which 5 complaints under art.22 of EA. In relation to the received signals and inquiries checks of documentation have been performed and answers have been prepared which were sent to the addressees.

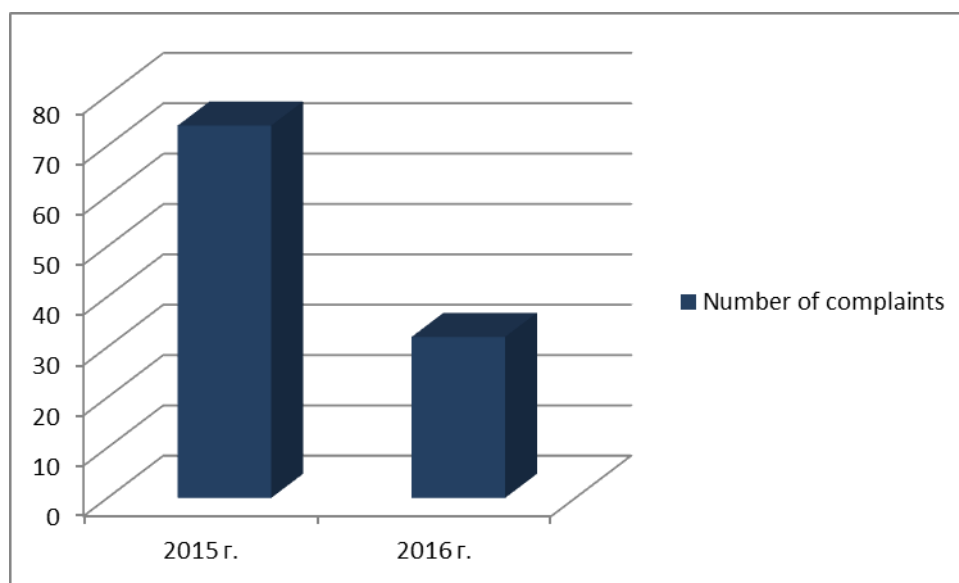
On two of the complaints regarding network connection, EWRC has taken a decision by finding that the complaints are unfounded and has terminated the files. The administrative procedure for one of the complaints has not been completed due to factual and legal complexity of the case. Two of the complaints filed with EWRC were not considered in substance, due to irregularities found that were not remedied within the set deadline.

The number of complaints in the natural gas sector in 2016 decreased by 70% compared to 2015 and was the lowest compared to the other three sectors. This is mainly due to the small number of gasified households in the country, but also to the control exercised by EWRC of the licensed gas distribution companies in relation to their work with users, the annual activity reports provided and the on-site inspections.



In 2016 consumers submitting complaints at the gas distribution companies represent less than 0.04% of all gas consumers. Complaints were filed at 11 of total 35 licensed territories in Bulgaria. The number of natural gas users in these 11 territories (72 802) accounts for 83% of all natural gas consumers in the country. Most complaints were filed with Overgas Network AD for the licensed territory of Sofia Municipality and Bozhurishte Municipality – 8 complaints (0.03% of all household customers of the company). This represents 25% of all complaints in the sector.

In 2016 number of complaints at gas distribution companies was 32, which is a decrease of 57% compared to 2015, when they were 74.

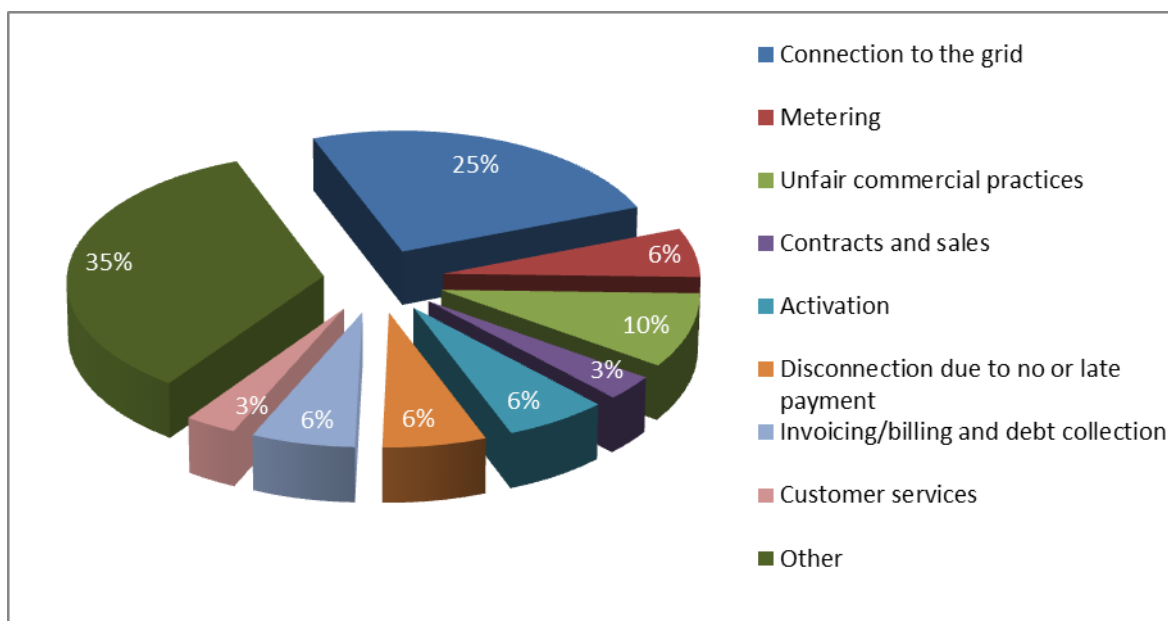


Classification of submitted at gas distribution companies complaints by subject, is as follows:

Complaint subject	Number of complaints	Number of complaints satisfied
Connection to the grid	8	1
Metering	2	1
Unfair commercial practices	3	2

Contracts and sales	1	0
Activation	2	2
Disconnection due to no or late payment	2	2
Invoicing/billing and debt collection	2	0
Customer services	1	0
Other	11	5

As seen from the chart below, complaints are mainly related to: connection to the distribution networks, inaccurate metering, unfair commercial practices, contracts and sales, activation, disconnection due to non-payment, billing, price and customer services and others.



In 2016 gas distribution companies received:

- 8 complaints on connection to the distribution networks, 7 of which unfounded and one founded and satisfied.

- 3 complaints on unfair commercial practices – undelivered invoices. Complaints were founded and satisfied.

- 11 other related to: failures in the internal installations of customers which are their property and responsibility; others submitted by persons who are not clients of the gas distribution company and but are connected to the gas point; activation charge after late invoice payment.

Gas distribution companies examined the complaints received and accepted 13 of them to be reasonable and they were resolved.

All complaints lodged at the companies were replied within the set deadlines.

Information (on dispute settlement means, clarification of clients' rights, how they can contact EWRC when they are not satisfied with the response or have not received it, etc.) is published on the websites of most of the companies and is announced in customer service centres.