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NATURAL GAS MARKET IN UKRAINE: COEXISTENCE ISSUES OF COMPETITIVE AND MONOPOLISTIC BEHAVIOR

The gas industry plays an extremely important role in the level of energy supply, energy independence of the state, its effective functioning, which is reflected in all areas of activity. All the issues, which are related to gas production, transmission, distribution, and consumption, in general, and enterprises, which operate in this industry, in particular, remain relevant from the point of view, that the European vector was chosen by Ukraine. The importance of this subject is justified by strengthening the focus of administrative and legal regulation on structural changes in the market: from a monopolistic structure, which has arisen historically to competitive, which manifests itself in the increase of natural gas market participants now.

The existence of natural monopoly has been resulted by the specifics of the gas industry. At the same time, the fact that the sole ownership of the gas market is justified, such a situation distorts competition, deprives the incentive to invest in the network's development, discriminates against certain business entities regarding network access, etc. The modern natural gas market model of Ukraine is being investigated in the article. The optimality of the simultaneous existence of monopolistic and competitive entities on the natural gas market is justified. The structure of the natural gas market in the Netherland, as a country, which has a significant influence on the formation of the European market, is an example of the successful creation of a transparent high competitive market for industrial and household customers for many years. Requirements imposed by regulations for the functioning of the natural gas market are systematized.

Keywords: competition, natural monopoly, vertically integrated undertaking, natural gas market, third energy package.

Problem setting and its relevance. Natural gas market of Ukraine is at the stage of intensive reform of its functioning. The implementation of such individual aims as protection of customers, achieving energy efficiency and independence, development of energy infrastructure, ensuring the financial stability of market members, makes the need for research of the issues regarding optimal simultaneous existence of competitive and monopolistic entities in the natural gas market with taking into account chosen European vector of development relevant.

Analysis of recent research and publications on the topic of research. Features of functioning of enterprises, which are natural monopolies, are considered in the works of the following scientists: Bazylevych V. D., Bashnianin H. I., Filiuk H. M., Yaremko I. Y. Approaches to regulating the activity of natural gas market participants, analysis of the legal field were considered in the works of the following researchers: Katsuba A. V., Korotia M. I., Yukhymets R. S. and other.

The purpose of the article is to investigate the existing model of natural gas market functioning. Analyze justification of simultaneous existence of monopolistic and competitive behavior on the natural gas market. Systematize rules that apply to the natural gas market in order to evaluate its implementation and to identify positions that need to be implemented.

Presentation of the main material. The classics of political economy A. Smith, D. Ricardo, A. Marshall considered competition and monopoly issues in the market as phenomena, each with its own advantages and disadvantages. A. Marshall[1] considered monopoly on the market from the point of view of its dual character and reveals the important role of this form, which is in the public interest, in particular by comparing it with the conditions of free competition. On the one hand, those monopolists are considered to have the ability to set prices that will maximize monopoly income, which goes against with the public

[1] Маршалл, А. (2008). *Основы экономической науки*. Москва: Эксмо.

interest. However, A. Marshall, who is in favor of monopoly and opposed to free competition, puts forward such a position: in conditions where production is concentrated in the hands of one person or one company, the total costs involved are usually lower than in conditions where the same general costs are shared among a large number of small competing manufacturers. Monopolistic entities can be necessary structures and at the same time, they could impede market development as the best result of its functioning is reached in conditions of free competition.

Considering the modern position of Ukraine's energy sphere, namely a large share of natural gas use in comparison with other types of energy resources, the implementation of ratified European Union regulations, ensuring energy efficiency, issues related to the efficient functioning of the natural gas market remain relevant. Prime examples of natural monopoly are gas transmission and gas distribution companies, which function as entities of the natural gas market. Natural gas supply companies of competitive behavior function in the market alongside of them. Thus, the structure of the Ukrainian gas market is represented by a competitive and natural-monopoly state at the same time.

The biggest player in the Ukraine natural gas market is Joint Stock Company «National Joint Stock Company «Naftogaz of Ukraine» is a vertically integrated undertaking by its structure. The EU Directive establishes rules for the internal market in natural gas. According to it, 'vertically integrated undertaking' means a natural gas undertaking or a group of natural gas undertakings where the same person or the same persons are entitled, directly or indirectly, to exercise control, and where the undertaking or group of undertakings perform at least one of the functions of transmission, distribution, LNG or storage, and at least one of the functions of production or supply of natural gas[1].

Naftogaz of Ukraine, as of 2019, includes producing companies, oil and gas transportation companies, companies engaged in the sale of oil, gas and refining products (Table 1).

Table 1

Subsidiaries of NJSC «Naftogaz of Ukraine» (as at September 30, 2019)

Name/Type of activity	% Interest held as at 30 September 2019
Production of gas, oil and refinery products	
Ukrgasvydobuvannya, JSC	100,00
Ukrnafta, PJSC	50,00 + 1 share
Zakordonnaftogaz, Subsidiary Enterprise	100,00
Oil and gas transmission	
Ukrtransgaz, JSC	100,00
Ukrtransnafta, JSC	100,00
Ukrspectransgaz, JSC	100,00
Wholesale and retail distribution of oil, gas and refinery products	
Gaz Ukraiiny, Subsidiary Enterprise	100,00
Gas supply company Naftogaz of Ukraine, LLC	100,00
Gas supply company Naftogaz Trading, LLC	100,00
Naftogaz Trading Europe AG	100,00
Kirovogradgaz, Open JSC	51,00
Ukravtogaz, Subsidiary Enterprise	100,00

Resource: according to data[2]

[1] Офіційний сайт Національної комісії, що здійснює державне регулювання у сферах енергетики та комунальних послуг (2009). *Директива Європейського Парламенту і Ради № 2009/73/ЄС від 13 липня 2009 року про спільні правила для внутрішнього ринку природного газу та про скасування Директиви 2003/55/ЄС*. <https://www.nerc.gov.ua/?id=4730> (2020, February, 17).

[2] Нафтогаз України (2019). *Скорочена консолідована проміжна фінансова звітність станом на та за дев'ять місяців, які закінчилися 30 вересня 2019 року*. <http://www.naftogaz.com/files/Zvity/Naftogaz9m2019fs-Consolidated-UKR.pdf> (2020, February, 11).

From the point of view of natural gas production specificity, processing, transportation, distribution and supply activity, which is characterized by technological complexity and capital intensity, the existence of NJSC «Naftogaz of Ukraine» as the only complex of vertically integrated undertaking is reasonable and justified. The approach to forming vertically integrated undertaking in the chain from extraction to sale of oil and gas was proposed by a legal act «The main directions of reforming the oil and gas complex of Ukraine» (1996). However, the Presidential Decree «On Measures of Implementation of State Policies in the Field of Natural Monopolies», adopted in 1997, aimed at the gradual separation (unbundling) of gas transmission activities from its producing activities, which demonstrates a better level of optimality (Table 2).

Table 2

Key regulatory acts for merger and delimitation of oil and gas companies issues

Year	Regulatory acts	Proposals
1996	Resolution of the Cabinet of Ministers of Ukraine «On the Main directions of reforming the oil and gas complex of Ukraine» No 1510, December 16, 1996	It is proposed to create vertically integrated oil and gas companies, which will carry out the entire cycle of economic functions in the industry from oil and gas production to oil sales. Inclusion in the oil and gas companies of the branch machine-building enterprises and research institutes, and also geological prospecting and oil and gas building companies was provided by this document.
1997	Decree of the President of Ukraine «On Measures to Implement State Policies in the Field of Natural Monopolies» No 853/97 August 19, 1997	It contained instructions for the development of comprehensive measures on the gradual separation of activities related to the transportation of natural gas through both main and distribution pipelines, from activities related to natural gas production, gas condensate processing, construction and drilling operations, etc.
2009	Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC	In the internal gas market it must be realized effective separation of networks from activities of production and supply. Without such a measure, there is a risk of discrimination not only in the operation of the network but also in the incentives for vertically integrated undertakings to invest adequately in their networks.
2015	Law of Ukraine «On the natural gas market», No 329-VIII April 9, 2015	It is determined that the gas transmission system operator may not carry out activities of production, distribution or supply of natural gas; a gas distribution system operator may not perform production, transmission or supply of natural gas. A gas storage operator may not perform production or supply of natural gas.

Resource: built by the author

The implementation of measures for integration of production capacities of different oil and gas enterprises into unified oil and gas companies inevitably has the effect of reducing the number of business entities, which carry out economic activity of production and further sale of oil and natural gas. All of this can be considered as obstruction of free economic activity, restriction of competition in the oil and gas industry of Ukraine and monopoly development[1].

Therefore, the items of the Resolution, which contained proposal for creating the vertically integrated undertaking, would go against the rules of Commercial Code Of Ukraine in terms of promoting competition and failing to commit any unlawful acts, which can have a negative impact on competition. In contrast, the Decree No 853/97 has a more rational regulation. The items of this Decree measure up other legal acts in force today.

[1] Кацуба, А. В. (2014) *Управління господарською діяльністю з видобутку та подальшої реалізації нафти та природного газу: адміністративно-правові засади*. Харків: Друкарня Мадрид. (2020, February, 04).

The problem of market model is relevant at the current stage of the gas market transformation in Ukraine. Due to the fact, that European vector of development was chosen by Ukrainian foreign policy, the country needs to fulfill certain obligations which are stipulated by the European legislation.

The third energy package provides a number of European Union legislations, which oblige Ukraine to execute its items, which are determined by Association Agreement between the European Union and Ukraine, Treaty establishing Energy Community. Third energy package directives, inter alia, aimed at demonopolization of the energy markets. In particular, it states that the aim of these regulatory acts is separation of production or selling activities from gas transmission and distribution by network.

Adoption of the Directive «Concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC» was based on the necessity of overcoming numerous obstacles to establish an open, transparent, efficient natural gas internal market. Among other, in the list of preconditions for the adoption of the directive was mentioned, that promoting fair competition and easy access for different suppliers should be of the utmost importance for Member States in order to allow consumers to take full advantage of the opportunities of a liberalized internal market of natural gas[1].

It has been established by aforementioned Decree, that transmission system operator (natural or legal person who carries out the function of natural gas transmission) must be independent. Subsidiaries of the vertically integrated undertaking performing functions of production or supply shall not have any direct or indirect shareholding in the transmission system operator. Thus, on January, 1 2020, Gas Transmission System Operator of Ukraine LLC (as a part of Ukrtransgaz, JSC, the sole shareholder of which is NJSC «Naftogaz of Ukraine») as part of the implementation of the European approach, was unbundled into an independent structure.

Also, the distribution system operator, which carries out the function of natural gas distribution and the supply undertaking, which is selling, including resale, natural gas to customers should be separated on the natural gas market of Ukraine. According to the Law of Ukraine «On the natural gas market»[2], the distribution system operator may not perform production, transmission or supply of natural gas. Fulfilling this requirement, the separation of distribution and supply activity was implemented in 2015. Thus, before 2015 joint stock companies for gas supply and gasification carrying out the activity within two types of licenses: the license for natural gas distribution and the license for natural gas supply. Since the middle of 2015 their activities are limited by distribution license.

Separation of mentioned types of activity is aimed to increase competition in the market. In order to develop competition in the internal market in gas, large non-household customers should be able to choose their suppliers and enter into contracts with several suppliers to secure their gas requirements[1].

Therefore, Ukrainian natural gas market is in reform condition, particularly, measures of bringing national legislation into measure up European standards are carrying out. On the market, which is under analysis, presented monopolistic entities as well as competitive (Table 3).

On the natural gas market, according to the Register of Natural Monopoly Entities, exclusive rights for gas transmission through the Ukrainian territory and gas distribution belong to a limited range of entities. Gas Transmission System Operator of Ukraine LLC – the only enterprise, which delivers natural gas determined as natural monopoly. Gas distribution companies such as Vinnitsyagas JSC, Zhytomirgaz JSC, Lvivgas JSC, Kharkivgaz JSC are functioning at certain territories of licensed natural gas distribution activities are also determined as natural monopoly subjects.

According to the Register of economic entities, which carrying out activity in the fields of energy and utilities there are more than 600 economic entities, which have license for natural gas supply. Not all of mentioned amount of licensees carrying out gas supply for customers, however, industrial customers have a real wide choice of suppliers.

Natural gas market of Ukraine, as of early 2020, has competition segments as well as monopolistic (Figure 1). Natural gas producing in the country carrying out by the state and private enterprises at the same time. These enterprises sale gas for the citizens and industry needs. NJSC «Naftogaz of Ukraine», which is state-owned, entrusted with special obligations of providing citizens, heating energy producers and budget organizations. Therefore this segment is 100 % provided by NJSC «Naftogaz of Ukraine». However,

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[1] Офіційний сайт Національної комісії, що здійснює державне регулювання у сферах енергетики та комунальних послуг (2009). *Директива Європейського Парламенту і Ради № 2009/73/ЄС від 13 липня 2009 року про спільні правила для внутрішнього ринку природного газу та про скасування Директиви 2003/55/ЄС* <https://www.nerc.gov.ua/?id=4730> (2020, February, 17)

[2] *Закон про ринок природного газу, 2015* (Верховна Рада України). *Офіційний вісник України*, *37*, 67.

Table 3

Structure of the natural gas market in Ukraine

No	Members of the natural gas market of Ukraine	Entities	The total number on the market	Market form
1.	Gas transmission system operator	Gas Transmission System Operator of Ukraine LLC	1	Natural monopoly
2.	Gas distribution system operator	«Distribution system operator «Vinnitsyagas» JSC, «Distribution system operator «Zhytomirgaz» JSC, «Distribution system operator « Lvivgas » JSC and other	46	Natural monopoly
3.	Gas supplier	«Gaspostachservis» LLC «Vinnitsyagas zbut» LLC «Zhytomirgaz zbut» LLC «Gasovik» LLC «Tsentralna gazopostachalna kompaniia» LLC TOB «Energogasrezerv» LLC «Gaspostachinvest» and other	>600	Free competition

Resource:built by the author

such a state is not classified as dominant in the market – the company has no ability to abuse its dominant (monopolistic) position[1].

The segment of natural monopoly is presented by the gas transmission system operator and the gas distribution system operators. In order to provide national security and economic considerations sole ownership of the gas transmission system is justified. Despite gas distribution system operators are monopolists, they are not in a position to abuse its state because their activities are controlled by National energy and utilities regulatory commission (NKREKP), on the one hand, and by the Antimonopoly Committee – on the other hand. Such a regulation has an impact on financial position of enterprise. Thus, due to the prolonged lack of review of the established gas distribution tariff, which is in competence of NKREKP, gas distribution enterprises accumulated significant amount of losses.

It should be mentioned, that the segment, which is related to gas supply, is characterized by high level of competition in gas market. This forms conditions for free supplier choosing by the customers of such resource. At the same time, such possibility is using only by industrial customers.

Household customers get gas from the suppliers, which are entrusted with special obligations (SSO). the grater half of gas supply fir citizens (71 % in 2018, 76 % in 2017) is provided by suppliers, controlling stake of which was owned by the distribution system operators (united under the brand «Regional gas company»)[2].

«Vinnitsiagas zbut» LLC, «Volyngas zbut» LLC, «Zhytomirgaz zbut» LLC are examples of these supply enterprises. Gas supply enterprises with special obligation have an exclusive (monopolistic) position in the supply of gas to household customers.

[1] Звіт за результатами дослідження щодо наявності монопольного (домінуючого) становища у публічного акціонерного товариства «Національна акціонерна компанія «Нафтогаз України» *Офіційний сайт НАК «Нафтогаз України»* <http://www.naftogaz.com/files/Information/NAK-Monopoly-Research.pdf> (2020, February, 11).

[2] Офіційний сайт Національної комісії, що здійснює державне регулювання у сферах енергетики та комунальних послуг (2019). *Звіт про результати діяльності Національної комісії, що здійснює державне регулювання у сферах енергетики та комунальних послуг, у 2018 році* <http://www.nerc.gov.ua/?id=39678> (2020, February, 11).

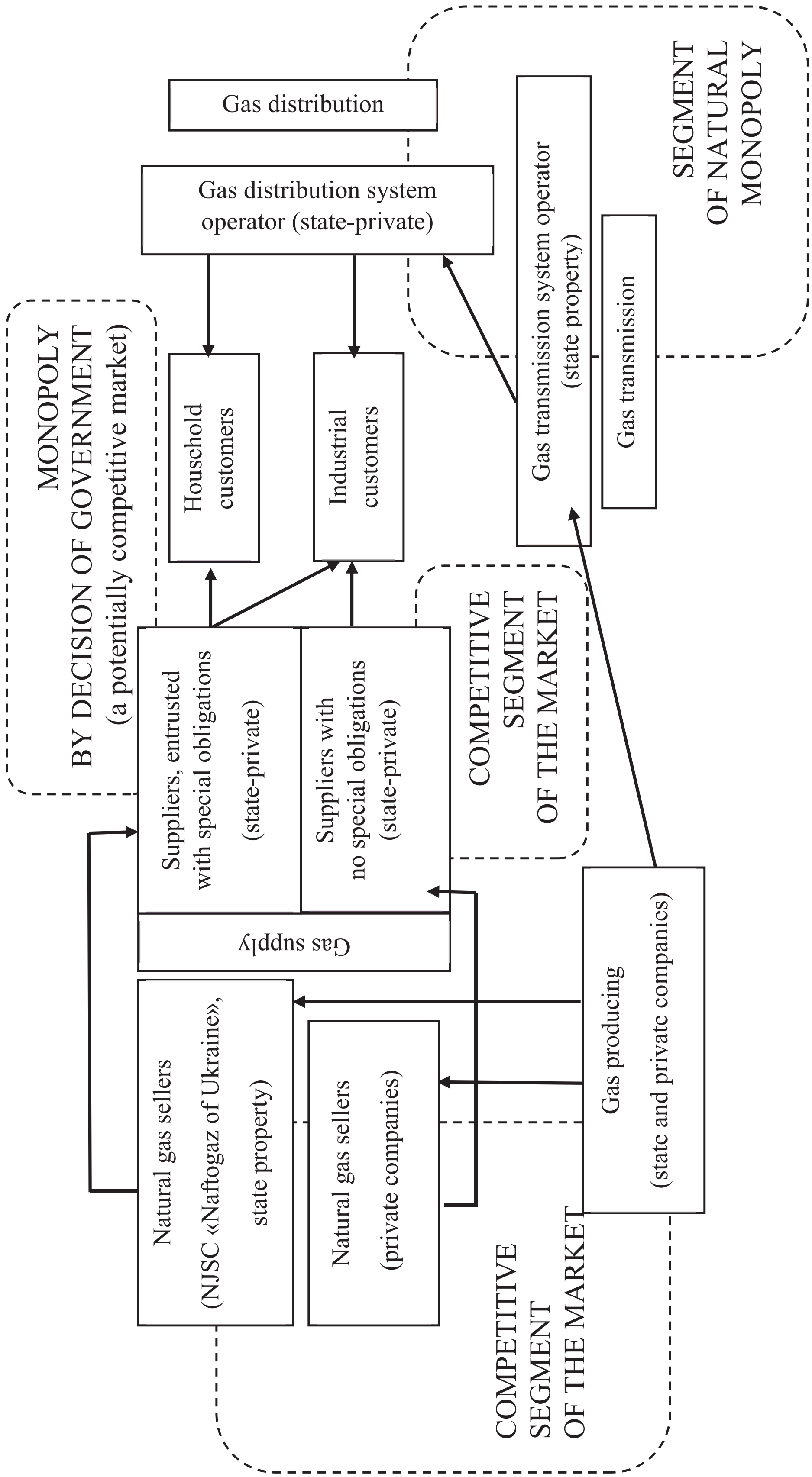

Fig. 1. Natural gas market model of Ukraine

Resource: built by the author

There are three segments in the natural gas market: competitive, segment of natural monopoly, monopoly by decision of government. Each of entities of these segments has its own features, which should to be taken into account during the indicators setting for improving the market functioning.

In order to ensure the stable, efficient, secure functioning of the members of natural gas market and the market itself, the problems regarding the state regulation of this sphere are to be solved. State regulation of natural gas market bases on the regulatory acts of Ukraine, which are developed in accordance with the requirements of the Third Energy Package. The regulation has as its goals protection of customers, high competition, security of energy supply and energy development (Figure 2).

Achieving each of the goals consists of a detailed list of conditions, which should be implemented. Among the tasks, which are directed toward an achievement of goals: creating conditions for free choice of supplier by the customers, separation of activity, optimise the use of gas etc. An assessment of the level of implementation, and a general goal as a result, should be carried out by certain criteria. Thus, for example, as indicators of achieving the goal related to the customer protection there are following: no violations of consumer rights, 100% gas metering. There is Herfindahl-Hirschman index as an indicator to determine the level of competition in the market. The value of index should be < 0,1.

The implementation of the Decree into legal framework of Ukraine provides that the appropriate rules and relationships between the entities will be established on the natural gas market. Thus, in the direction of market liberalization, the focus is on equality of consumer opportunities in their choice of supplier, access of natural gas undertakings for to national consumers. Approaches, effect of which is to increase competition, promote the development of gas networks, in particular by attracting investment, which will certainly be reflected in the level of security. This is one of the criteria for the effective functioning of the market. Important criteria, inter alia, is non-discriminatory balancing mechanisms.

Ukrainian model of the gas market has already responded to certain rules, which were aforementioned and are presented in the figure 2, in particular in activity separation, transition to balancing mechanism according to European standards. Implemented items are to be improved. In particular, the items, which is regarding to balancing operations. One of key obligation – ability of household customers to choose supplier – it has not yet been implemented.

Requirement for independence of gas distribution system operators on the natural gas market is fulfilled. The separation was completed in 2015, since combination a distribution activity with a supply activity is forbidden. At the same time gas distribution enterprise can be a part of vertically integrated undertakings. In this case, the main requirement for the retail gas market is fulfilled.

Condition of the gas transmission system operator unbundling was fulfilled at the beginning of 2020.

Measures, aimed at fulfilling the requirement for ability of household customers to choose supplier, are subject to further implementation. In order to achieve safety and efficiency of gas market entities it is necessary to develop and implement measures regarding reducing the producing and technology losses, its economical use, etc.

It should be noted, that governmental regulation, including licensing activities, setting gas loss rates, providing the ability of household customers to choose and change supplier, market monitoring and analysis carried out by such entities as the Cabinet of Ministers of Ukraine, NKREKP, the Ministry of Energy and Coal Industry of Ukraine and others.

European countries, operating in one whole space, are implementing European Union legislation. At the same time, the structure of gas markets in Europe is different. The Netherlands energy sector is mostly private, but the state and municipalities retain a structural role and ownership including in the natural gas sector (Table 4).

In general, in the Netherlands, mixed ownership is dominated in the natural gas market. The natural gas sector in the Netherlands is privately owned. Distribution and supply activities are unbundled, meeting the requirements of the Directive. Assets of distribution companies cannot be sold to private companies or investors. Competition in the retail natural-gas market is thus well developed. A relatively large proportion of small consumers have hence switched away from the incumbent suppliers. Three large supply companies – Eneco, RWE-Essent, and Vattenfall-Nuon – dominate the retail market. These companies are owned by municipalities, eg Eneco shareholders are 44 municipalities. At the same time the company, by consent of shareholders, is going to sell the shares in private ownership in 2020. The number of enterprises engaged in retail to end consumers is 32.

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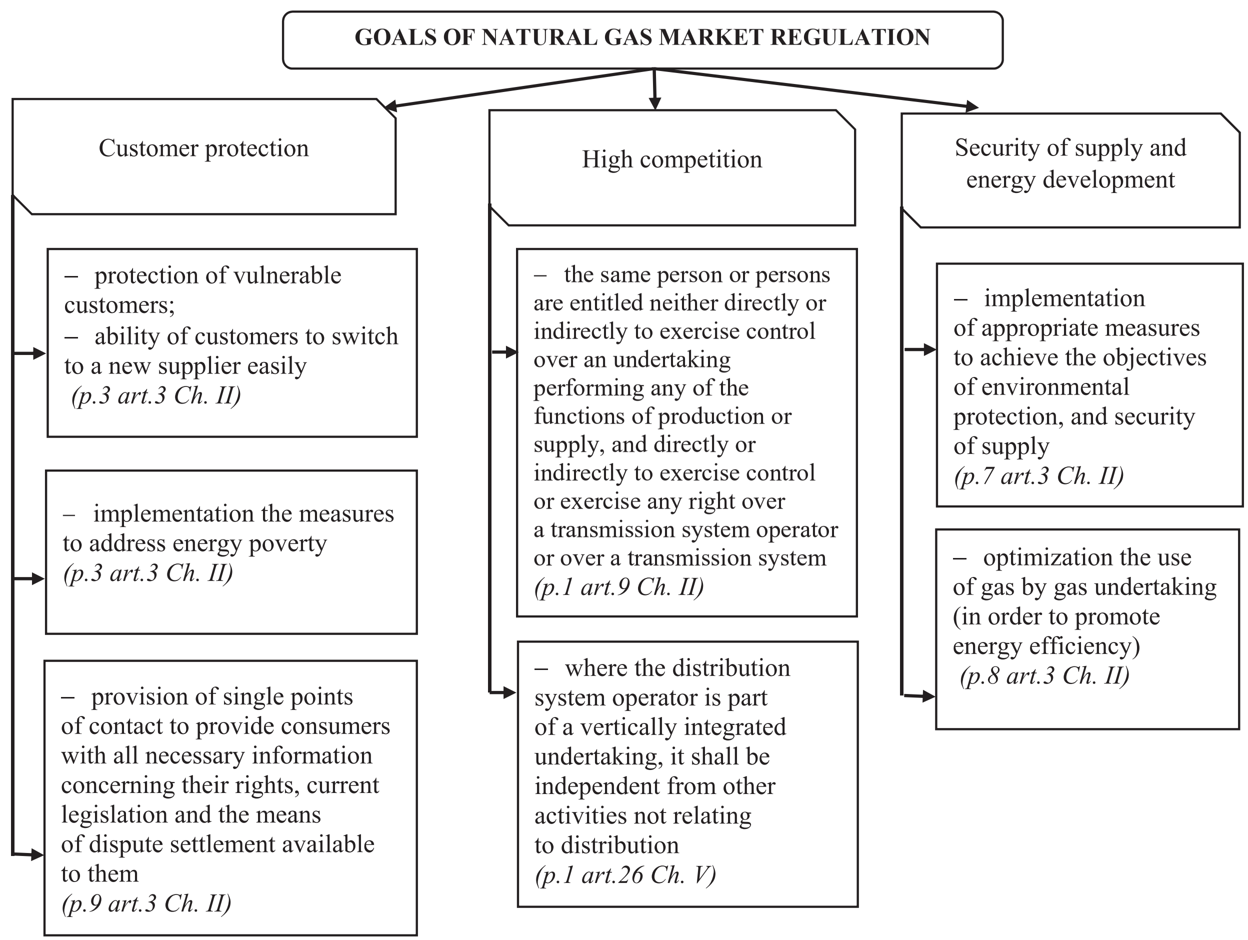

Fig. 2. Goals of natural gas market regulation and rules for the internal market in natural gas according to EU Directive

Resource: built by the author

Table 4

Ownership Form of the natural gas market in the Netherlands

Market segments	Market entities	Ownership
Production	Nederlandse Aardolie Maatschappij	Private (joint venture Royal Dutch Shell (50 %) and ExxonMobil (50 %))
Transmission	Gasunie	State property (100 %)
Wholesale	GasTerra	Mostly private (EBN.B.V. (40 %), Royal Dutch Shell (25 %), Esso Nederland B.V. (25 %), Dutch state (10 %))
Distribution	Cogas, Eenduris, Enexis, Liander, Rendo, Stedin, Westland	State property (municipalities)
Supply (retail to final consumers)	Eneco, RWE-Essent, Vattenfall-Nuon – 3 main companies	State property (municipalities) – with the prospect of selling shares in private ownership

Resource: built on data[1]

In Ukraine, compared to European countries, implementation of transformation measures in the natural gas market are continuing. Gas distribution and its supply, production and transmission activities are unbundled in the Netherland. Whereby, unbundling distribution from supplying is more effective and which is in Third Energy Package requirements, in particular, in a part of the ability of household customers to choose supplier, unlike in Ukraine, where this approach is possible only for industrial consumers.

It should be noted, that gas transmission in both the Netherlands and Ukraine is under the full control of the country. Such an approach is highly justified from the point of view of national security, both economic and energy, and technology.

Gas companies simultaneously coexist in the context of competitive and natural monopolistic behavior in the market. Being at the stage of reformation of Ukrainian gas sector measures for unbundling competing structures from structures that, in certain (natural) circumstances, are remained in a monopolistic state. Transformational measures are aimed at improving the efficiency of the gas market in Ukraine which is a rational distribution of nature resources and capital, fair pricing for gas, creation of non-discriminatory access to gas networks, increasing the competition, providing consumers by gas to meet their needs within a stable and secure way.

Conclusion. Natural gas reserves the leading position in the structure of energy resources, which are using to meet the needs of both household and industrial customers. All together have an impact on the level of prosperity of the country in its various spheres of activity. The theoretical aspects of functioning of entities are creating a basis for understanding the advantages and disadvantages in the prevalence of a particular form in the market: monopolistic or competitive. Each of them has its own characteristics and directly affects the economic development of the country. That`s why, optimal simultaneous existence in the market of competitive and monopoly entities is important. Natural gas market, which is a priority in reforming processes, combines the features of both of the aforementioned forms. Whereby existence of monopoly, which is usually considered as unwanted form, is naturally justified for certain types of activity.

Measures of unbundling certain types of activity in the gas sector aimed at achieving efficiency throughout the market. Creation the competitive conditions in a gas sector lead to the removal of the incentive for vertically integrated undertakings to discriminate against competitors on the one hand, on the other – encourages businesses to invest into maintaining and improving their position in the industry.

[1] Офіційний сайт Організації економічного співробітництва та розвитку (2020). *Fossil fuels support country note* <https://www.oecd.org/fossil-fuels/data/> (2020, February, 16).

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