



ЭКОНОМИКА ОТРАСЛЕВЫХ РЫНКОВ

ECONOMICS OF INDUSTRIAL MARKETS

DOI: 10.22363/2313-2329-2023-31-1-30-48

EDN: RRHVLW

UDC 339

Research article / Научная статья

Defining trends in the evolution of the Russian gas market

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Abstract. The new “driving force” of the liberalization of the conditions for the functioning of the gas sector associated with demonopolization and the formation of an effective structure of the domestic gas market with a high level of competition and fair principles of the organization of natural gas trade for Russian consumers are the ongoing changes in the economic situation in the global energy market. Against the background of the expected decline in pipeline gas exports to Europe (the volume of decline may amount to 100 billion cubic meters in the medium term) it is important to focus efforts on the development of the domestic gas market, since the task in these conditions is more urgent than ever. First of all, to accelerate the transition to market pricing mechanisms (except for the population) using indicative prices on the stock exchange and within the framework of inter-fuel competition. Currently, gas prices in the domestic market are subsidized by exports, which, as mentioned above, is going to decrease, which in turn will lead to a decrease in such subsidies, and accordingly, there will be a need for higher rates of price growth in the domestic market. The importance of further development of gas exchange trading in Russia is emphasized on various government platforms. The main guidelines for improving the exchange mechanisms for the sale of natural gas are contained in the “National Plan (Roadmap) for the development of competition in the Russian Federation for 2021–2025”. It should be noted that the development of gas exchange trading should take place by increasing the economic attractiveness for participants, creating favorable economically conditioned prerequisites for an equal supply of gas to the exchange for all sellers, as well as developing an appropriate regulatory framework.

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Keywords: energy, gas sector, gas market, regulation, exchange, gas exchange trading, natural gas, the SPIMEX Gas Exchange, export

Article history: received October 15, 2022; revised November 15, 2022; accepted December 7, 2022.

For citation: Allayarova, N.I., & Ketsba, B.I. (2023). Defining trends in the evolution of the Russian gas market. *RUDN Journal of Economics*, 31(1), 30–48. <https://doi.org/10.22363/2313-2329-2023-31-1-30-48>

Определяющие тенденции в эволюции рынка газа России

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Аннотация. Новой «движущей силой» либерализации условий функционирования газового сектора, связанных с монополизацией и формированием эффективной структуры внутреннего газового рынка с высоким уровнем конкуренции и справедливыми принципами организации торговли природным газом для российских потребителей являются происходящие изменения экономической ситуации на мировом энергетическом рынке. На фоне предполагаемого снижения экспорта трубопроводного газа в Европу (объемы снижения могут составить до 100 млрд куб. м в среднесрочной перспективе) важно сосредоточить усилия на развитии внутреннего рынка газа, поскольку задача в этих условиях как никогда актуальная. В первую очередь ускорить переход к рыночным механизмам ценообразования (кроме населения) с использованием индикативных цен на бирже и в рамках межтопливной конкуренции. В настоящее время цены на газ на внутреннем рынке субсидируются за счет экспорта, который как говорилось выше, идет к снижению, что в свою очередь приведет к снижению такого субсидирования, и соответственно, появится необходимость более высоких темпов роста цен на внутреннем рынке. Важность дальнейшего развития биржевой торговли газом в России подчеркивается на разных правительственных площадках. Основные ориентиры совершенствования биржевых механизмов реализации природного газа содержатся в «Национальном плане („дорожной карте“) по развитию конкуренции в Российской Федерации на 2021–2025 годы». Следует отметить, что развитие биржевых торгов газом должно происходить путем повышения экономической привлекательности для участников, создания благоприятных экономически обусловленных предпосылок для равного предложения газа на биржу для всех продавцов, а также разработки соответствующей нормативно-правовой базы.

Ключевые слова: энергетика, газовая отрасль, рынок газа, регулирование, биржа, биржевая торговля газом, природный газ, газовая биржа СПБМТСБ, экспорт

История статьи: поступила в редакцию 15 октября 2022 г.; проверена 15 ноября 2022 г.; принята к публикации 7 декабря 2022 г.

Для цитирования: *Allayarova N.I., Ketsba B.I.* Defining trends in the evolution of the Russian gas market // Вестник Российского университета дружбы народов. Серия: Экономика. 2023. Т. 31. № 1. С. 30–48. <https://doi.org/10.22363/2313-2329-2023-31-1-30-48>

Introduction

The issues of strengthening the unity of the economic space of Russia, increasing the efficiency and competitiveness of the Russian economy occupy an important place among the numerous tasks of the socio-economic development of the Russian Federation. One of the tools for developing competition in the sectors of the economy of the Russian Federation, creating an efficient and competitive Russian economy is the creation of an organized commodity market for hydrocarbons. This problem is most relevant in relation to the oil and gas industry. The Russian oil and gas industry provides more than 2/3 of the total consumption of primary raw materials and 4/5 of their production, traditionally makes a significant contribution to the country's economy — in 2019, oil and gas revenues accounted for almost 40 % of the federal budget and almost 40 % of the state's foreign exchange earnings. The oil and gas industry accounts for 12 % of Russia's industrial production and 3 % of those employed in it in the total number of people employed in the economy¹.

The key problem of the functioning and development of the Russian gas industry throughout the entire historical period is the lack of full-fledged inter-fuel competition, as well as the transition from state regulation of gas prices in the domestic gas market to market pricing and the development of competitive relations in the industry.

The above and a number of other problems related to the development of an efficient domestic gas market cannot be solved without changing approaches to improving the system of domestic gas trading. The development of the natural gas exchange trading system and its integration into the common gas market of the Russian Federation should be attributed to the features of the development of the domestic gas market. This is due to the implementation of state policy measures to ensure, protect and develop competition in the country, which make it possible to withstand external economic challenges, overcome internal restrictions that hinder economic growth, as well as the development of exchange mechanisms in commodity markets, the formation of a common gas market of the Eurasian Economic Union (EEU).

The participation of the state in the management of such a strategically important sector of the economy as the gas industry is due to the need to resolve issues related to the strategic direction of the development of the domestic gas market to ensure the energy security of the Russian Federation, as well as the economic problems of the industry that concern both Group Gazprom and independent gas producers. Thus, in accordance with the Energy Strategy of the Russian Federation for the period up to 2035, improving the domestic gas market and effectively meeting domestic demand for gas is a priority task for the gas industry to meet the needs of the socio-economic development of the Russian Federation. As part of the key measures to ensure the solution of this problem, such as:

¹ Information illustrated edition “Execution of the federal budget and budgets of the budget system of the Russian Federation for 2019”. Retrieved September 15, 2022, from https://minfin.gov.ru/common/upload/library/2020/09/main/Ispolnenie_federalnogo_budzheta_2019_god.pdf

1. development of competition and market relations in the industry:
 - creation, promotion and improvement of exchange mechanisms for the sale of gas industry products, as well as trading in derivatives for these products;
 - phased transition from the regulation of wholesale gas prices to market pricing mechanisms;
2. increasing transparency and reasonableness of tariff setting:
 - improving the mechanism of non-discriminatory access to gas transportation services through pipelines and the use of underground gas storage facilities;
 - gradual elimination of cross-subsidization of gas supplies to various constituent entities of the Russian Federation and various consumer groups.

Achieving these goals necessitates the further development of exchange mechanisms and financial instruments of the Russian gas market in accordance with current trends and prospects for creating a common EEU gas market, as well as the globalization of world markets. These circumstances have determined the relevance of the topic of this article and the need for a comprehensive understanding of the trajectory of the development of the Russian gas market.

The purpose of the study is to determine the place and role of exchange trading in gas on the basis of identifying the features and trends in the functioning of the gas market.

Literature Review

Both Russian and foreign scientists and scientific institutes are engaged in the study of this research topic. Problems and prospects for the development of exchange trading in natural gas in Russia are regularly reviewed by the Analytical Center under the Government of the Russian Federation, the Institute of Energy and Finance (IEF), the Institute for Energy Research of the Russian Academy of Sciences, the Energy Institute of the National Research University Higher School of Economics, the Oxford Institute for Energy Studies, the Energy Center of the Moscow School of Management SKOLKOVO, Analytical Group ERTA (energy, regulation, transport, analytics). The scientific works of A. Rudiger and W.J. Tompson (2004), M. Fulwood (2022), J. Henderson (2011), C. Locatelli (2014), A. Yakunina (2017) and others are devoted to various aspects of the problems of further development of the domestic gas market of Russia in general and exchange mechanisms.

Research methods

When conducting research and presenting the material, general scientific approaches (systemic, structural-functional, etc.) and methods of analysis and synthesis, as well as methods of comparative and economic-statistical analysis, the method of graphic images were applied. The information basis of the study was the

national legislative and regulatory acts in the field of regulation of the gas market of the Russian Federation. The empirical base of the study was analytical materials from scientific articles, statistical collections, official websites of the Federal State Statistics Service, the Ministry of Energy of the Russian Federation, the Ministry of Economic Development of the Russian Federation, the Ministry of Finance of the Russian Federation, the Federal Antimonopoly Service (the FAS Russia) and a gas exchange in St Petersburg by SPIMEX, the St Petersburg International Mercantile Exchange.

Results

Factors and problems of natural gas market development in Russia

Russia is one of the largest producers of natural gas in the world — producing 17.2 % of the world’s natural gas, it ranks second in the world in terms of gas production. There is a fundamental restructuring of the global environment in which the gas industry operates. Gas relations between the European Union and Russia have become more predictable in light of the “resolution” of long-term commercial disputes (Noskov & Nesterov, 2021).

The Russian gas industry, which is based on the fuel and energy complex, plays an important role in generating revenues for the budget system of the Russian Federation, and also makes a significant contribution to national security and the country’s socio-economic development. Considering the dynamics of oil and gas revenues of the federal budget of the country, it is necessary to emphasize the significant role of the gas industry in terms of the volume of revenues from gas sales — in 2021, natural gas provided 7.9 % of the total revenue of the federal budget, yielding first place to the oil industry, which accounts for 28.1 % of the total income (see Figure 1). At the same time, other income in 2021 decreased by 7.8 percentage points compared to 2020 (72.0 %), while the gas industry showed growth, adding 2.0 percentage points compared to the previous year (5.9 % in 2020).

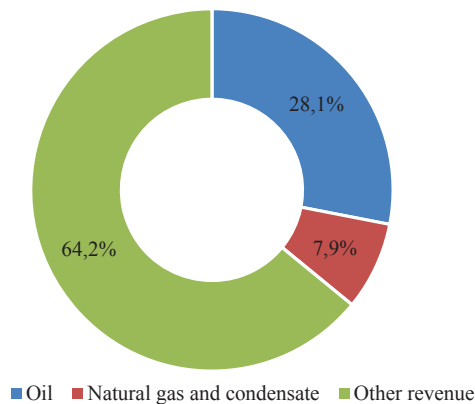


Figure 1. Main components of revenues to the federal budget of the Russian Federation in 2021 (share in total federal budget revenues, %)

Source: developed by the authors based on data from the Ministry of Finance of the Russian Federation. Retrieved from https://minfin.gov.ru/ru/document?id_4=300261-informatsionnoe_illyustrirovannoe_izdanie_ispolnenie_federalnogo_byudzheta_i_byudzhetov_byudzhetnoi_sistemy_rossiiskoi_federatsii_za_2021_god

The gas industry includes all links in the value chain: geological exploration, field development, gas production, storage, processing, export supply, distribution within the country and its further transportation. Here it is obvious that such specificity of the industry indicates certain limits and strict requirements for the development of all the above subsystems of the industry.

It should be noted that the state regulation of the gas industry is carried out in accordance with the energy policy of Russia, which contains a set of government measures, priorities and development directions in the field of energy supply, energy consumption, energy efficiency and energy saving of the Russian economy.

A holistic (systematic) representation of the gas industry as a component of the state energy policy of Russia is shown in Figure 2. From the position of a holistic evolutionary view, the competitive civilized Russian gas market as a complex subsystem of the gas industry occupies a strategically important place not only in ensuring the energy security of Russia, but also in the development of this industry and increasing the efficiency of gas use in related sectors of the economy. Objectively, the gas sector, historically associated with many sectors of the economy both as a supplier and as a consumer, in accordance with the postulates of the generally recognized in modern economic views and applicable for several decades to solve applied problems, the economic-mathematical model of the input-output balance (model “costs — output”), developed by V. Leontiev (Leontiev, 1925), is an investor in related industries (Tebekin, 2019). At the same time, as A. Tebekin (Tebekin, 2019), “it is logical that from the point of view of effective corporate development, in order to maintain a balance between the structural and infrastructure components, companies in the energy sector, in accordance with the value chain model of Porter, M. (Porter, 1985), are called upon to observe the proportions investing in the main and supporting value chain” (Tebekin, 2019).

According to the Energy Strategy of Russia for the period up to 2035, it is also laid down that Russia, as a country with a powerful gas transmission system, will continue to move along the path of developing and improving the efficiency of this transport system, in particular, the creation of a gas transmission infrastructure in Eastern Siberia and the Far East with the possibility of its integration into the Unified Gas Supply System, as well as the development of logistics for the supply of liquefied natural gas.

The main attention in the “Energy Strategy of Russia for the period up to 2035” is given to competition and market relations in the domestic gas market as a condition for its improvement, development of the industry, and increasing its competitiveness.

In Figure 2, the domestic gas market of Russia is considered as a “nested” system that implements priority measures to demonopolize the economy and develop competition and market relations in the gas sector, measures to implement an effective state energy policy of the country, respectively.

In turn, organized (exchange) trade in natural gas is considered as an element of the system — the competitive Russian gas market. Such an element-system is presented here as a developing institution of open gas trading on exchange principles with equal access for all suppliers and consumers, contributing to the improvement of the domestic gas market and the creation of a competitive environment in the gas industry (see Figure 2).

Thus, in the Energy Strategy of Russia for the period up to 2035, one of the tasks of the gas industry to meet the needs of the country’s socio-economic development is to improve the domestic gas market and effectively meet domestic demand for gas. The solution to this problem includes a set of key measures (see Figure 3), which, among other things, are aimed at expanding the activities of small and medium-sized businesses and increasing the competitiveness of the industry:

- 1) phased transition from state regulation of gas prices on the domestic gas market to market-based pricing mechanisms;
- 2) ensuring financial transparency;
- 3) improving the methodology for calculating tariffs for gas transportation services through main gas pipelines for all gas suppliers;
- 4) ensuring non-discriminatory access of independent organizations to gas transportation services through main gas pipelines and increasing the availability of gas transmission infrastructure of main gas pipelines;
- 5) gradual elimination of cross-subsidization of gas supplies;
- 6) formation of a common gas market of the EEU;
- 7) preservation of a single pipeline gas export channel;
- 8) complex application of these measures.

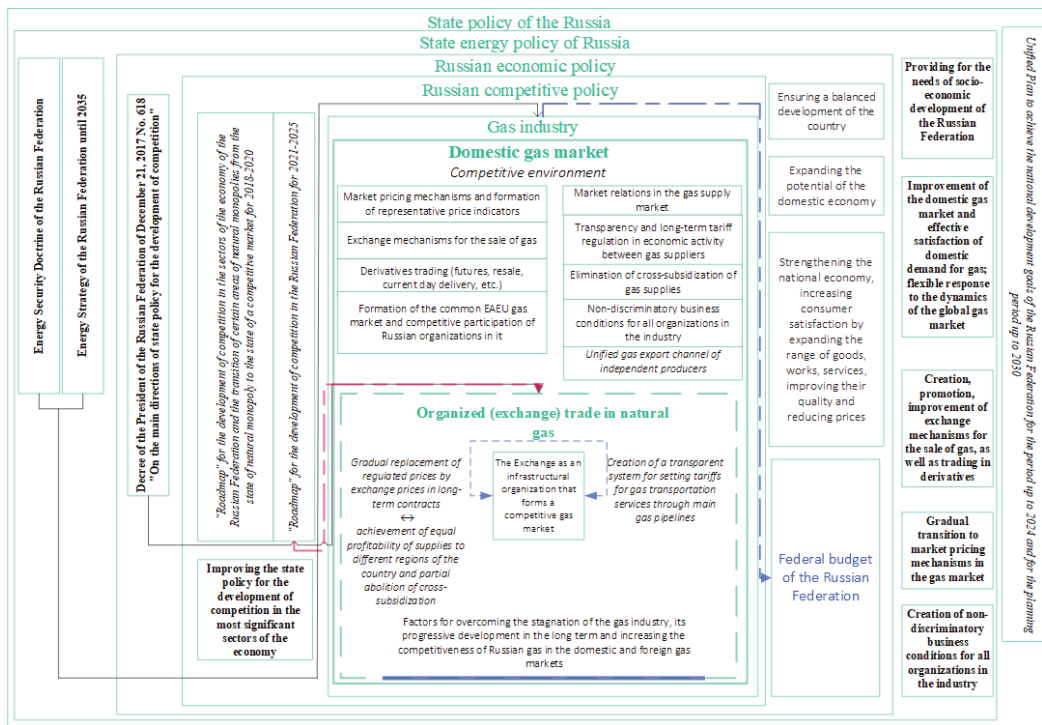


Figure 2. A holistic (systematic) representation of the gas industry in the political and economic activities of the state
 Source: Author’s build.

Of these measures, the leading role belongs to the gradual transition from state regulation of gas prices in the domestic gas market to market pricing, since the problem of developing competition and market relations in the gas sector,

as well as the difficulty of transitioning to market pricing mechanisms in this market, are due to such well-known deterrent factors, as a natural monopoly sector of the national economy, a high level of state regulation of the conditions for the functioning of the industry (not only in terms of pricing), weak competition between producers, high barriers to entry for independent gas companies, underdeveloped commercial infrastructure of the gas market, the use of cross-subsidizing gas supplies to the regions and various consumer groups, the high dependence of the gas sector and, as a result, state revenues, on the state and conjuncture of the world energy market, etc.

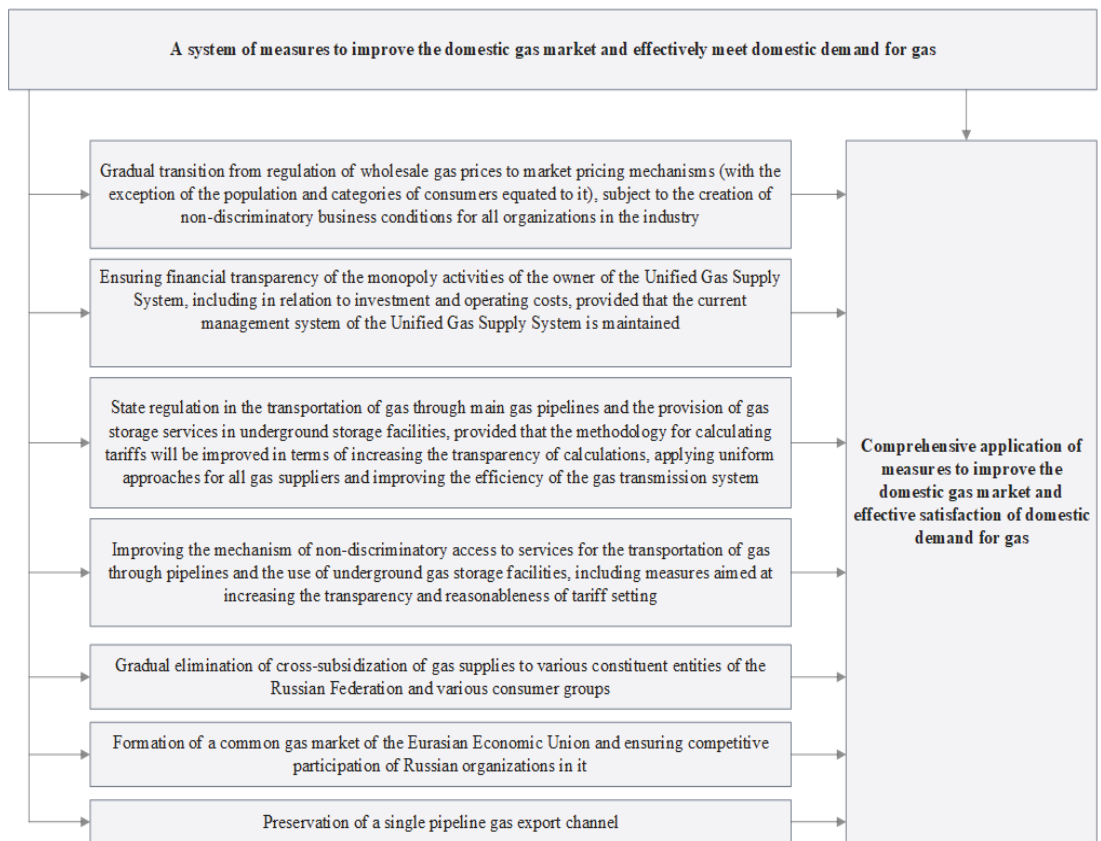


Figure 3. Structure of the system of measures to improve the internal gas market

Source: build by the authors based on provisions of the Energy Strategy to 2035. Retrieved September 15, 2022, from <https://minenergo.gov.ru/node/1026>

And in this regard, it is advisable to consider the organization of exchange trading in natural gas in Russia as one of the ways to solve the above problems and a tool to overcome the constraining factors. The creation of a free exchange gas market, the transition to market pricing mechanisms in the gas sector would indicate the development of competition and market relations in the domestic gas market.

This issue is of relevance, since the manifestations of the global economic crisis (Polunin, 2020), complicated by the COVID-19 pandemic (Ronco, Navalesi &

Vincent, 2020) and its consequences affecting the world community in general and the Russian Federation in particular, present new requirements to the efficiency of state and corporate management of the gas industry.

The main guidelines, the list of necessary measures for the creation, promotion and improvement of exchange mechanisms for the sale of natural gas, as well as trading in derivative financial instruments for the supply of gas, are contained in the following policy documents:

- Decree of the President of the Russian Federation of December 21, 2017 N 618 “On the main directions of state policy for the development of competition”;
- National plan (“road map”) for the development of competition in the Russian Federation for 2021–2025.

In accordance with the above program documents, the expected result of the development of competition and market relations in the gas industry will be:

- transition to market pricing through the formation of prices for natural gas, provided, among other things, by an increase in the volume of sales of natural gas at organized auctions;
- formation of exchange and OTC indices;
- increase in the share of gas sold at exchange auctions to the total volume of natural gas sales on the domestic market — at least 10 %;
- the number of gas sellers participating in organized auctions — at least 5;
- creation of liquid exchange and over-the-counter indicators of prices for natural gas, liquefied carbon gas;
- the use of exchange and over-the-counter price indices in the areas of tax and budgetary regulation;
- reduction of volumes of cross subsidizing within the framework of long-term tariff regulation.

Thus, the main characteristic of the economic transformation of the natural monopoly sector of the national economy is the movement towards competition. Reality shows that the energy exchange market is a competitive segment of the energy market, in which the liquidity parameters of exchange operations are achieved, the number of participants involved in exchange trading increases, and it also leads to the transformation of exchange energy contracts into financial instruments of the market.

Trends and forecast for the development of exchange trading in natural gas in Russia

In recent years, gas production in Russia has been steadily growing, with a new record high in 2021 of 762.8 bcm, the exception is 2020, when a decline is noted for a number of indicators, in particular, the production of natural and associated petroleum gas decreased by 6.1 % after a maximum of 737.7 bcm in 2019. The deterioration in the performance of the mining complex in the specified period occurred against the backdrop of measures taken to prevent the spread of coronavirus infection, and a sharp deterioration in foreign trade conditions due to a sharp decline in oil and gas prices,

as well as an increase in geopolitical and sanctions risks, had an additional negative impact on natural gas production and consumption.

Also, according to Gazprom specialists (Annual report for 2020), one of the main factors behind the fall in gas demand and prices to the lowest levels in the first half of 2020 was a gas surplus in the European market due to high levels of gas reserves in underground gas storages (UGS), an increase in the supply of liquefied natural gas (LNG), warmer weather conditions in European countries, the risk of interruption of transit through Ukraine, and, in turn, unadjusted volumes of supplies by gas producers had a negative impact on the dynamics of gas demand and prices.

The volume of Russian gas exports last year amounted to 245.8 bcm (1.5 % more than in 2020 and lower than the maximum value of 2019 by 1 %). The growth in gas exports is largely due to the increase in gas supplies to China via the “eastern” route — the Power of Siberia gas pipeline. Thus, in 2021, pipeline gas supplies from Russia to China almost tripled. In addition, the second long-term export contract signed in February 2022 via the Far East route provides for the annual supply of up to 48 bcm of gas. In order to diversify gas supply routes for export, in 2024 it is planned to build the Soyuz Vostok gas pipeline in Mongolia, which will become a continuation of the Power of Siberia gas pipeline and increase supplies by another 50 bcm per year.

An important characteristic of 2021 was the active recovery of the global economy, which contributed to the growth in energy prices, which reached historical highs by the end of 2021. The volatility of gas prices in 2021 is explained by: a) on the TTF platform, such trends as low temperatures in Europe at the beginning of the year and a significant reduction in gas reserves in European UGS facilities, a decrease in the volume of own gas production in the region, as well as the redirection of uncontracted LNG volumes to the premium Asian market, became a factor; b) a significant factor in the volatile price environment recorded in Q3 2021 was the decrease in gas reserves in European storage facilities to their minimum values for five years by the end of the period, as well as increasing competition for flexible LNG supplies from the Asia-Pacific region and Latin America; c) in Q4 2021, the growth of gas prices at European hubs continued due to the actions of speculators on the European stock exchange and uncertainties regarding the balancing of global markets associated with the COVID-19 pandemic, disruptions in the transport and logistics supply chains of Russian raw materials.

Figure 4 shows the trend of gas consumption in Russia and the structure of gas supplies to the domestic market by consumer group over 2015-2020. It should be noted that the period 2015-2018 have a pronounced upward trend in total gas consumption in Russia. In 2020, the supply of gas for domestic consumption decreased by 3.3 % compared to 2019 and amounted to 464.4 bcm, which is primarily due to the weather factor (in particular, warm weather conditions in the autumn-winter period of 2019/2020), as well as due to a reduction in production as a result of the introduction of restrictive measures to prevent the spread of a new coronavirus infection and a general decline in economic activity. At the same time, the share of natural gas in the country’s fuel and energy balance in 2020 amounted to almost 54 %, having not changed significantly in recent years.

The structure of natural gas consumption in 2020 is as follows:

- domestic industrial consumers and domestic utilities (63.1 %) — increased by 3 percentage points compared to 2019;
- for the needs of the energy sector (UES of Russia) (29.8 %) — a decrease of 2.1 percentage points compared to 2019;
- including technological needs of the UGSS and UGS facilities (7.1 %) — a decrease of 0.9 percentage points compared to 2019 (see Figure 4).

The consumption of natural gas by the “ancillary” sectors, in fact, does not have a real impact on the market, but is reflected in gross indicators, in particular its supply for technological needs of the UGSS and UGS increased from 29.1 to 40.7 bcm in 2015–2018, which accordingly affected the aggregate demand.

Between 2013 and 2020, the growth rate of the Russian economy was characterized by a pronounced deceleration trend. Thus, the decrease in GDP at the end of 2013 amounted to 1.3 %, sharply slowing down from 3.4 % a year earlier, and in 2016. GDP grew by only 0.2 %, with slight improvements in 2018 (2.5 %), 2020 (3.0 %) (see Figure 5). The exception is 2021, when the GDP growth rate amounted to 4.7 %, renewing the maximum value of 2010 (4.5 %), this is due to the recovery processes after the largest fall of the global economy in post-war history due to the spread of coronavirus infection and the introduction of restrictive measures.

According to experts of the Ministry of Economic Development of Russia, the main economic reasons that led to the slowdown of GDP growth in the period under review were the impact of the economic sanctions imposed against and on the part of Russia, the decline in energy prices, the weakening of the ruble, the low degree of diversification of the national economy, the reduction of investment in fixed capital, as well as the influence of the external environment (the global economy).

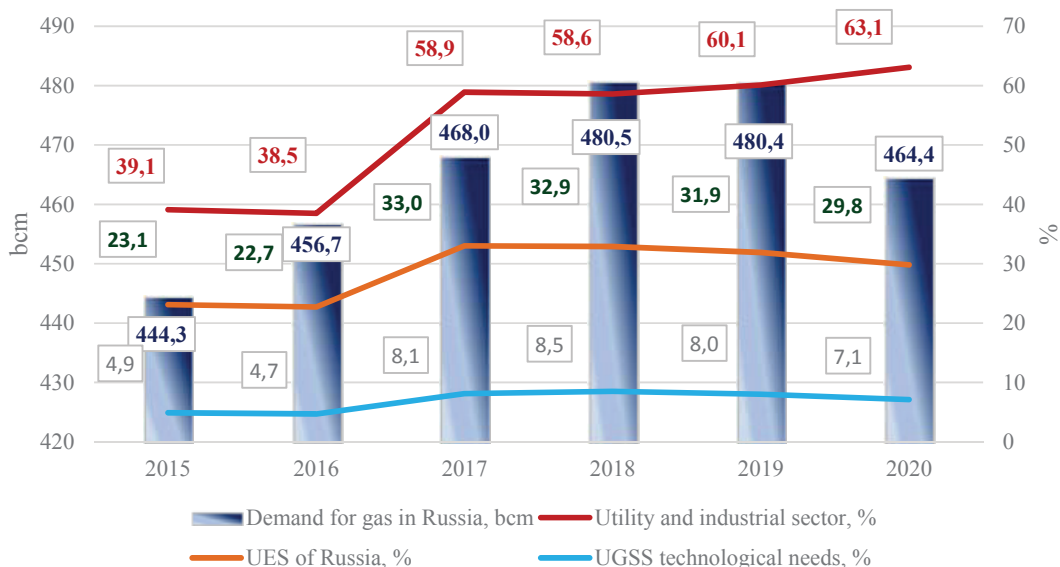


Figure 4. Dynamics of gas demand in the Russian Federation in 2015–2020

Source: built by the authors based on: Fuel and Energy Complex of Russia. Retrieved September 15, 2022, from https://www.cdu.ru/tek_russia/issue/

The peculiarity of the national economy is that in order to ensure the sustainability of economic growth, the achievement of the equivalence of distribution and exchange, the quality of industrial and non-productive consumption are important elements. The export of energy resources is a key factor in the growth of the national economy. This dependence of the economy creates threats to the sustainability of economic growth.

In accordance with the structure of natural gas consumption in Russia, shown in Figure 4, we can note the correlation between the dynamics of GDP (see Figure 5) and the level of demand for gas on the domestic market. However, it should be noted that none of the consumption sectors directly correlates with GDP. The only exception is dependence of electricity consumption on economic growth. At the same time, electricity consumption itself is only one of the factors of gas demand in the electricity sector (Posypanko, 2018).

The expansion and deepening of gas processing and gas chemistry, the development of high value-added production, the production of end-consumption goods with high added value can become a driver of gas demand growth in the industrial sector, but there are some restraints, for example processing of raw materials for large mining companies is a non-core business due to the lack of necessary competencies, and specialized enterprises are not willing to expand activities, as this is a very capital-intensive process. The other sectors will not have a significant impact on the volume of consumption, which is explained by the inertia of the economic system (Anisimov V.G., Anisimov E.G., Saurenko & Tebekin, 2020).

The modern development of Russia is characterized by a number of problematic aspects due to unfavorable trends in the development of the world economy, as well as the global energy crisis. For Russian gas, 2021 was a turning point, a cardinal change of states from gas abundance and record low prices in 2020 to external market tensions and very high gas prices in 2021 (Yermakov, 2021).

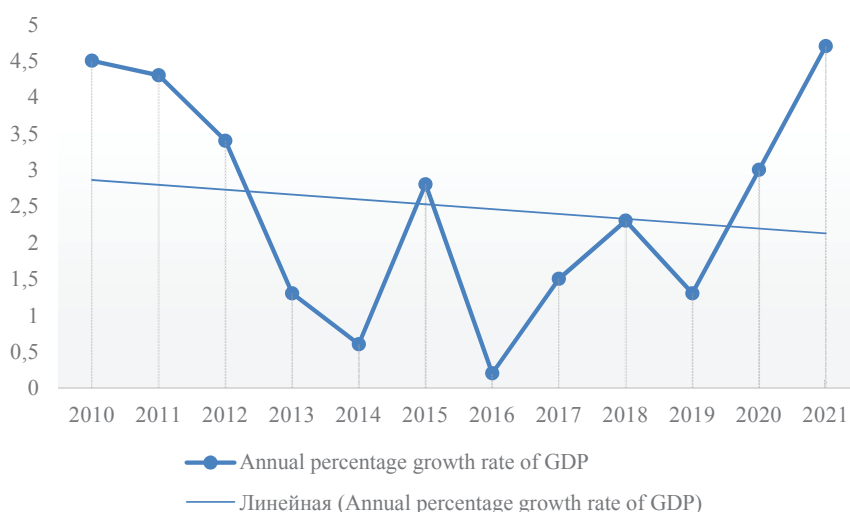


Figure 5. Dynamics of Russia's GDP in annual terms, 2010-2021, %

Source: compiled by the authors. Retrieved September 15, 2022, from https://www.economy.gov.ru/material/directions/makroec/ekonomicheskie_obzory/ and <https://rosstat.gov.ru/folder/124101?print=1>

In the current environment of declining gas exports to foreign markets, the development of the domestic gas market requires a faster and more flexible transition to the second phase, associated with market-based pricing mechanisms, since gas prices on the Russian gas market are subsidized by exports, which reduction will reduce the possibility of such subsidies in the future, and as a result, a higher rate of price growth on the domestic market will be required.

Currently, price regulation in the field of gas supply is carried out in accordance with the Federal Laws “On Gas Supply”, “On Natural Monopolies”. According to the first of these laws, state regulation of gas prices should take into account economically justified costs and profits to form the investments needed to develop the gas industry and ensure its economically efficient operation. At present, however, regulated gas prices lag far behind the economically justified level.

The essence of market pricing lies in the fact that the income received should ensure the reimbursement of costs and the formation of financial resources for investing in the gas supply to Russian consumers. The aforementioned lag observed so far does not allow the formation of financial resources in the volumes required for the development of the gas supply sphere in the interests of the domestic market, which in turn can affect the reliability of gas supply to consumers and the implementation of investment projects to modernize the industry.

The gas supply market remains highly concentrated, dominated by three vertically integrated oil and gas companies (VIOCs) — Gazprom, Novatek and Rosneft — which put pressure on the current model of the Russian gas market by fighting for liberalization of exports and for conditions in the domestic market (Henderson & Arild, 2017), according to the FAS Russia, they own over 70 % of the market. The shares of each of the economic entities in the domestic gas market are above 8 %, the access of new competitors to this market is hampered not only by administrative barriers. This structure of the gas market emerged as a result of a process that gradually sought to align organizational models with the specifics of the Russian institutional and economic environment (Henderson, Mitrova, Heather, Orlova & Sergeeva, 2018).

The Round Table Recommendations of the State Duma Energy Committee draw attention to the development of exchange trade in the Russian Federation in order to stabilize and sustainably develop the gas industry. The development of exchange trade will make it possible to reliably determine gas prices, objectively calculate taxes and charges and compare gas prices in different regions of the country. In addition, the launch of trading in derivative financial instruments (futures, options) for natural gas will help manage the market risks associated with price volatility.

It should be reminded that since the 2000s there have been various attempts, with varying degrees of success, to link gas prices in the Russian market with market realities, but the appearance of an exchange-traded natural gas price index in 2014 at the St. Petersburg International Mercantile Exchange (SPIMEX) made it possible because the exchange provided the last and most serious opportunity to establish a market price, and ultimately the value of the gas index (price) at SPIMEX may become a benchmark for domestic wholesale gas prices, as well as lay the foundation for further gas market liberalization (Locatelli & Rossiaud, 2011).

Forming an idea of the development of gas exchange trade in Russia, it is necessary to highlight key facts.

The development of gas exchange trading in Russia started over 15 years ago. It has been a complicated and contradictory path, associated with changes in both the trading platforms themselves and the rules of trade. The practice of gas exchange trading in Russia began in 2006 via the Electronic Trading Platform (ETP) of Mezhhregiongaz: in accordance with the Russian Government Directive No. 534 of 02.09.2006 and the Russian Industry and Energy Ministry Order No. 294 of 31.10.2006 the experimental trading was launched.

A new stage in the development of natural gas exchange trading in Russia was the launch of gas exchange trading in October 2014 on the basis of SPIMEX. This was preceded by the Russian President's decision adopted on June 4, 2014 following a meeting of the Russian Presidential Commission for the Development Strategy of the Fuel and Energy Sector and Environmental Security.

A further step in the development of exchange-based mechanisms on the gas market was the launch of a project for the commercial balancing of gas trading on SPIMEX in 2021, which allows the buyer to sell at the market price the gas purchased earlier at the exchange instruments month-ahead, a day-ahead and on non-working day n , but not selected in full in the course of trading. The balancing mechanism makes it possible to fully ensure daily gas accounting using commodity trade accounts of the Commodity Supply Operator for both daily and monthly exchange-based gas supply contracts, which, in turn, makes it possible to reduce the time and simplify the procedures for preparing primary accounting documents based on the results of gas supply in the reporting month.

At the moment exchange contracts are concluded at three balancing points (BP): Nadym CS (compressor stations), 622.5 km (Lokosovo), Parabel CS using such exchange instruments as:

- “month-ahead”;
- “a day-ahead”;
- “on non-working day n ”.

Considering the dynamics of the main indicators of gas exchange trading, over the eight-year period from 2014 to 2021, we can note a steady increase until 2017 (see Table 1). Table shows that since the beginning (2014) of exchange trading in gas, more than 90 bcm of gas have been sold on SPIMEX. The maximum values for 2014–2021 were recorded in 2017:

- natural gas sales on the SPIMEX Natural Gas Section were 20.2 bcm. Natural gas sales were 20.2 bcm (up 20 % year-on-year). Of these, 17.5 bcm were sold by Gazprom, which reached the established limit by the end of the year;
- 16.5 bcm of gas were sold for the month-ahead (11.5 % more than in the previous year);
- 3.9 bcm of gas were sold for a day-ahead and on non-working day n contract (almost twice as much as in the previous year);
- the share of exchange-traded gas in total gas supplies to the domestic market was 4.3 % (0.6 percentage points more than in the previous year).

This is due to the recovery stage of the Russian economy in 2017 after two years of recession, reduced uncertainty, increased business activity, the recovery of domestic investment demand, which in turn is associated with the lowest inflation rate in the history of observation — 2.5 %. Russia's economic development is characterized by the strong influence of the inflation factor.

Along with the positive results in the period, there were unfavorable events for the gas exchange trading on the SPIMEX, including:

- reduction of the number of gas sellers from 5 to 4;
- the share of independent gas producers decreased 2.3 times compared to the same period of 2016 (from 5 to 2.2 bcm);
- trades under the contract for month-ahead was carried out on the delivery bases of the Vyangapurovskaya CS, Nadym CS, Yuzhno-Balykskaya CS;
- price growth on the Vyangapurovskaya CS, Nadym CS.

Despite a general decline in the main indicators of gas trading on the SPIMEX, observed since 2018, 2020 is characterized by an increase in gas sales on the exchange by 24.6 % to 16.0 bcm against 2019. Turnover in the section in monetary terms amounted to 56.6 billion rubles (26.3 % more than in the previous year). In total gas sales, 12.5 bcm were sold for month-ahead contract (18.9 % more than in 2019) and 3.6 bcm were sold for a day-ahead and on non-working day n contract (1.5 times more than in 2019). The share of exchange-traded gas in total gas supplies to the domestic market during this period also increased — 3.5 % (0.8 percentage points more than in 2019). The volume of gas sales by independent producers on the exchange trades doubled in this period.

Table 1

Main indicators of natural gas sales 2014–2021

Indicators	2014	2015	2016	2017	2018	2019	2020	2021
Gas supply to domestic market, bcm	458.4	444.3	456.7	468.0	481.9	480.4	464.4	470.0
Growth rate, %	0.3	-3.1	2.8	2.5	3.0	-0.3	-3.3	1.2
Natural gas sales on the SPIMEX gas exchange, bcm	0.5	7.6	16.8	20.2	15.2	12.9	16.0	6.7
Growth rate, %	–	15.2	2.2	20.2	-24.5	-15.1	24.6	-58.2
Selling for month-ahead, bcm	0.5	7.5	14.8	16.5	12.5	10.5	12.5	4.5
Selling for a day-ahead and on non-working day n , bcm	–	0.1	2.0	3.9	2.6	2.4	3.6	2.2
Revenue from gas exchange trading, bln RUB		21.4	46.5	60.5	48.4	44.8	56.6	25.9
Growth rate, %	–	–	2.2	30.0	-19.9	-7.5	26.3	-54.2
Share of total gas supplies to domestic market, %	0.1	1.7	3.7	4.3	3.2	2.7	3.5	1.4

Source: compiled by the authors based on Results of trading in the Natural Gas Section of SPIMEX. Retrieved September 15, 2022, from <https://spimex.com/markets/gas/trades/results/>

The dynamics of the above-mentioned indicators was characterized by a sharp decline in 2021, in particular, the turnover in the section in monetary terms more than halved compared to the previous year — 25.9 billion rubles. The decrease in the volume of natural gas sales in exchange trading occurred amid high volatility in energy prices in international markets, supply disruptions associated with accidents at petrochemical facilities, as well as against a background of increased economic uncertainty. The volume of gas sales by independent producers on exchange trades for 2021 decreased by 4.0 percentage points to 21 % of the total annual natural gas trading volume compared to the same period last year.

The main gas seller on the SPIMEX is Gazprom, whose sales should not exceed those of independent gas producers. Nevertheless, independent producers are increasingly reducing their sales. The FAS of Russia assumes that an increase in Gazprom’s quota for gas sales will enable the Russian gas market to reach a liquid parameter.

Despite numerous discussions of aspects of the development of gas exchange trading in Russia, Figure 6 shows that its actual sales for the period from 2014 to 2021 on the basis of SPIMEX was 96 bcm. It should be noted that in 2021 the Russian Federation produced 762.8 bcm of gas and exported 245.8 bcm of gas (Russian production) outside the country.

Thus, we see insignificant sales volumes by exchange technologies in comparison to the total market volume, which indicates the need to further develop gas exchange trading in the domestic market, and due to the special institutional and economic context of the country, structural changes cannot take place on the basis of foreign market models (Locatelli, 2014).

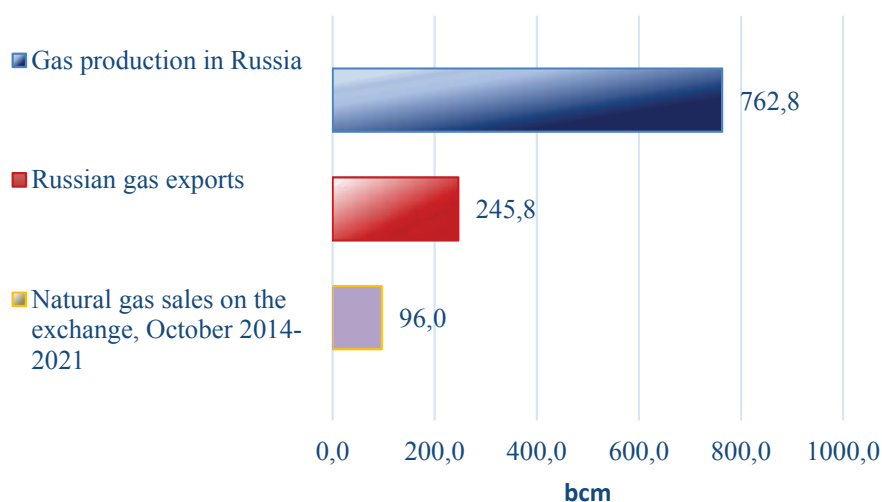


Figure 6. Comparison of natural gas sales on the SPIMEX with production and export volumes in 2021 (bcm)

Source: build by the authors based on: About the industry. Ministry of Energy of Russia.

Retrieved September 15, 2022, from <https://minenergo.gov.ru/node/1156>

Here we also note that since the demand for gas in the Russian market exceeds 400 bcm per year, the issue of gas pricing is of great importance (Henderson, 2011). The current system of domestic gas trade is characterized by an insufficient level

of competition, non-transparent financial flows and pricing principles, and the presence of closed cartel chains hinders the formation of civilized rules and institutions of gas trade. It is also worth emphasizing that the preservation of regulated domestic gas prices below world market prices for many decades is explained by the fact that domestic gas prices are responsible for ensuring social and economic stability (Yakunina, 2017).

Conclusion

Today's world is undergoing fundamental and inevitable structural changes. Today's situation of uncertainty and uncertainty about whether Russian gas will continue to be supplied to the European market is the worst of all because it keeps prices high and, as a result, keeps Russian gas revenues at record levels (Fulwood, 2022). The impact of Western sanctions on the gas sector can be summarized as follows: the effect of sanctions is zero, and moreover, accelerated the import substitution processes and development of domestic technologies, the expected reduction of gas exports to Europe in the medium term gives impetus for a more accelerated development of the domestic gas market and re-orientation to other potential sales markets.

Since energy exports are a key factor in the growth of the national economy, such economic dependence poses threats to the sustainability of economic growth. This makes a decisive revision of the trajectory of the national economy necessary. It is more important than ever to focus on priority directions of structural changes in the gas industry — improving the system of domestic gas trade, including the elimination of bottlenecks in the gas transmission system that hinder its development, and a gradual transition to a competitive domestic gas market.

In terms of the liberalization of Russia's domestic gas market, the current architecture of the sector represents a significant obstacle to the development of market-based pricing mechanisms and increased competitiveness in gas supply (Rudiger & Tompson, 2004).

One of the ways to create a competitive gas market in the country is to create an organized institution of open trade in natural gas on exchange principles with equal access for all suppliers and consumers.

In many world markets exchange trade in gas is actively developing, while in Russia certain shifts have been taking place recently, which indicate the readiness of the industry to transition to truly market-based pricing mechanisms in this sphere.

For consumers, this means greater reflection of the real costs of production and transportation in the price of gas (for some categories of consumers this means higher prices, and for some — lower), increased transparency of pricing and the formation of stable price benchmarks.

For producers — this will bring greater consistency and predictability of economic policy with regard to the need to subsidize the Russian economy with low gas prices, with regard to the development of competition, more generally — the development of gas market institutions.

Model calculations show that the existence of an exchange that serves as a balancing market, while the main supply is carried out through contractual interaction, increases the resilience of the entire domestic market (e.g., to demand-side shocks). At the same time, the transition to the predominant role of trading on the exchange at this stage is premature, given the presence of a large number of imbalances in the industry. Exchange prices can be used as anti-monopoly indicators (a necessary condition is the absence of dominance of any of the bidders on the exchange). Not only gas producers are interested in such changes, but also industrial consumers, for whom stability of supply and predictability of gas pricing in the long term become one of the main conditions for further development of relations in the gas market.

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