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EUROPEAN GAS MARKET RESTRUCTURING: INTERESTS OF IMPORTING COUNTRIES AND GAS EXPORTING COMPANIES

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Abstract. The article focuses on the process of restructuring the natural gas market in Europe. It is shown that the transformation of the European gas market is taking place under the decisive influence of the political decision of the European Commission and the governments of the EU largest gas consuming countries, first, to reduce gas consumption as much as possible in the shortest time; second, to replace Russian gas with imports from alternative sources. As both tasks have the highest priority, the EU countries act within the framework of political, not market logic, regardless of significant economic costs. To hedge against very high gas prices EU introduced since 15 February 2023 the market correction mechanism, capping the price of gas from the above. It is also expected the mandatory filling of gas storage facilities to at least 90% of their capacity before the winter season since 2023 would pressure gas prices downwards. Natural gas exporting companies operate within a system of market coordinates and are ready to participate in the process of transforming the European natural gas market only to the extent that does not contradict their economic interests. The politicization of gas cooperation between the EU and the US at the interstate level cannot change the market behavior of companies. Given the uncertainty regarding the perspective demand for gas in Europe, gas exporting companies are interested in concluding long-term contracts for the export-import of gas on a "take or pay" basis. Europe's unwillingness to massively engage into the long-term import-export contracts for LNG and readiness to bear additional costs in the form of elevated gas prices will allow companies in the short-term period to make high profits on the spot market.

Keywords: demand for natural gas, crisis, European Union, Russia, liquefied natural gas (LNG), price of gas, gas exporting companies, long-term contracts for LNG export.

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ПЕРЕСТРОЙКА ГАЗОВОГО РЫНКА ЕВРОПЫ: ИНТЕРЕСЫ СТРАН-ИМПОРТЕРОВ И КОМПАНИЙ-ЭКСПОРТЕРОВ

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Аннотация. Еврокомиссия и крупнейшие потребители природного газа в Евросоюзе поставили цели: во-первых, в кратчайшие сроки максимально сократить потребление природного газа; во-вторых, заместить российские поставки импортом из альтернативных источников. Страны ЕС руководствуются политическими соображениями, а не экономической логикой, и готовы нести значительные издержки. Компании – экспортеры природного газа намерены включиться в процесс трансформации рынка природного газа Европы только в той степени, которая не противоречит их интересам.

Ключевые слова: Евросоюз, Россия, природный газ, экспорт СПГ, цены, компании-газоэкспортеры, долгосрочные контракты.

INTRODUCTION

Since the second half of 2021, the balance of demand for natural gas and its supply has been sharply disrupted in the European market, which has led to a significant increase in prices. In 2022, an exogenous shock in the form of a geopolitical crisis in and around Ukraine, the EU sanctions against Russia and Russian companies, and counter-sanctions completely destroyed the European energy market and led to an acute crisis.

Over the past two years, the gas market in the region has been undergoing a deep and painful transformation. This transformation is driven by the political goals of the European Commission and the governments of European countries, which are the largest consumers of this fuel and raw material. They explicitly formulated two main goals: firstly, to achieve a rapid and substantial reduction in natural gas consumption, aligning with the ideology of a green energy transition; secondly, to replace Russian gas with imports from alternative sources.

Both goals are being pursued with due consideration of the limitations imposed by the actual balance of interests and opportunities within the global gas industry, as well as the dynamics of the overall economic development of European countries. However, it is crucial to note that energy security has been declared the paramount priority. Consequently, EU countries, operating within a framework that sometimes defies economic logic, are prepared and, in some cases, compelled to bear significant costs. According to preliminary estimates, in order to address the energy crisis and revitalize energy markets, EU countries and the UK, from September 2021 to January 2023 allocated budgetary and financial resources totaling EUR750 billion, or about 4% of their combined GDP. The declared emergency support measures will cost Germany 7.4% of its GDP, Italy – 5.2%, UK – 3.8%, France – 3.7% and Spain – 3.4% [source 1] (Fig. 1).

SCENARIO FORECASTS FOR GAS DEMAND IN THE EU

The prospects for gas demand in the EU countries critically depend on the pace of the energy transition. Over the past five years, the European Commission has developed and adopted a number of policy documents targeting member states, with a primary focus on accelerating the reduction in gas consumption. These documents include the EU Climate Law (June 2021), Readiness 55 (July 2021), and the Renewable Energy Sources (RES) Directive (July 2021). Due to the impact of an exogenous political shock, the European Union made the decision to expedite the phase-out of gas as quickly as possible, a commitment reflected in the REPowerEU Plan (May 2022).

Table 1 summarizes the targets from these documents for gas consumption in 2030. It also presents scenario forecasts of gas demand in the EU made up in 2022 by the International Energy Agency (IEA) and the European Network of Gas

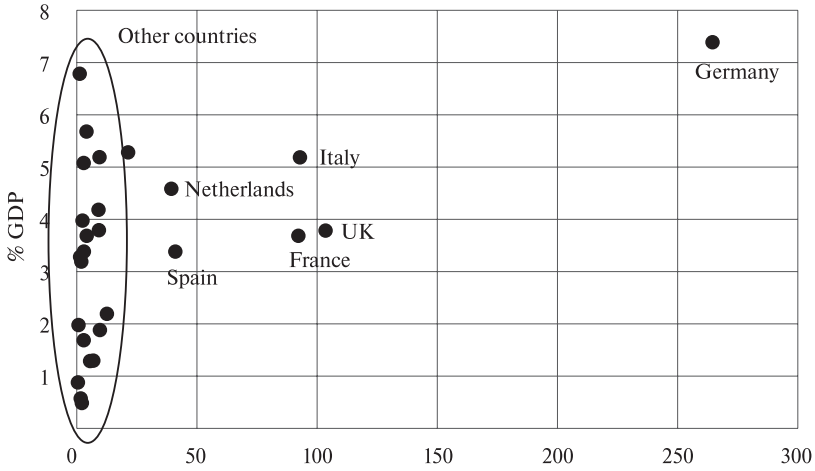

Fig. 1. Expenditures of European governments on combating the energy crisis and restructuring energy markets in 2021, billion euros

Source: [1].

Table 1. Dynamics of gas demand in the EU and gas imports from Russia, billion m^3

Scenario	2021 fact		2022 fact		2030 forecast	
	Demand	Imports from Russia*	Demand	Imports from Russia*	Demand	Growth/ decline to 2022
TYNDP 2022, National Trends	412	167	357	81–85	362	5
IEA, Stated Policies Scenario (STEPS)					340	–17
TYNDP 2022, Distributed Energy					313	–44
TYNDP 2022, Global Ambitions					307	–50
Readiness 55					290	–68
REPowerEU Plan taking into account the RES Directive					273	–84
The EU Climate Law					265	–92
IEA, Announced Pledges Scenario (APS)					242	–115
IEA, Net Zero (NZE)					204	–153
REPowerEU taking into account all decisions made on the green economy					196	–162

* Different sources give different data.

Source: [2, 3, 4; sources 1, 2, 3].

Transport System Operators (10-year network development plans – TYNDP) before the gas crisis of 2022. In 2022, gas demand in the EU decreased to 357 billion m^3, which is 13% below the level of 2021. Imports from Russia decreased from 167 billion to 81–85 billion m^3. The ratio of Russian gas imports to total EU gas consumption, which stood at 40.5% in 2021, dropped to 23–24% in 2022 [2, 3, 4; sources 1, 2, 3].

By 2030, the demand for gas in the EU, according to various forecasts, will decrease relative to the 2022 level by 17–162 billion m^3, reaching 196–340 billion m^3. In light of the growing trends, the TYNDP 2022 National Trends forecast has little chance of being realized. Cutting off the IEA's radical Net Zero (NZE) and REPowerEU scenarios, taking into account all the decisions made on the green economy, the demand for gas in the EU countries in 2030 will be in the range of 242–340 billion m^3, then there will be a reduction relative to 2022 by 17–115 billion m^3. The distribution of this reduction over the years depends on the speed at which gas-replacing capacities in wind and solar energy are commissioned, as well as the dynamics of natural gas imports.

TURN TO LNG IMPORT

In 2022, EU countries aggressively began replacing pipeline gas supplies from Russia with LNG imports. It is estimated that in 2022, compared to the previous year, they increased LNG purchases by 50 billion m^3, to 130 billion m^3 [source 4]. As a result, the share of LNG in the total EU gas imports increased from 23 to 39% [5]. Most of the purchases are made under spot contracts. The USA has been the largest supplier of LNG to the European region (EU + UK) since 2021, its share in its total European imports increased to 42% in 2022 compared to 28% a year earlier [source 5].

According to rough estimates, in the first incomplete four months of 2023, the total EU gas imports decreased by 26 billion m3 relative to the same period in 2022, almost exclusively due to a reduction in imports of pipeline gas from the Russian Federation (Table 2). Simultaneously, LNG imports increased by only 1 billion m^3. The overall reduction in purchases of Russian pipeline gas in 2023 may amount to 41–50 billion m^3. According to the forecast of the Institute of Energy Economics and Financial Analysis (IEEFA), the EU will need to increase LNG imports by 33 billion m3 in 2023 [source 5]. Accordingly, taking into account slight increases in pipeline gas exports from Azerbaijan, Norway, and North Africa in the second half of 2023, as well as an increase in biomethane production, it is expected to compensate for the expected decrease in gas production within the EU. To maintain gas consumption at the 2022 level, two conditions must be met: 1) sufficient regas-

Table 2. Growth/decrease in natural gas imports by EU countries in 2023 relative to 2022, billion m^3

Types of imported gas	Actual	Estimate for 2023	
	16 first weeks of the year	min	max
Pipeline			
Pipeline	–27	–41	–50
Russia	0	0	0
Norway	–1	0	0
Algeria	1	1	1
LNG	1		
Total	–26		

Source: [2] and the author's estimates.

ification capacity must be available; 2) there must be an increase in LNG imports.

Up until the spring of 2022, LNG regasification capacity in Europe amounted to 211 billion m^3. According to the consulting company *Timera Energy*, Europe will build 123 billion m^3 of new capacity by 2030, with decisions for 100 billion m^3 having been made after February 2022 [source 6]. As of the completion of this paper, EU countries have initiated or commenced construction of LNG regasification facilities with a total volume of 80.5 billion m^3, of which 30 billion m^3 could be operational by the end of 2023 [source 7].

Germany is spearheading substantial projects, having adopted a special Law in October 2022 to accelerate the transition to LNG usage [source 8]. Germany is engaged in equipping six floating storage and regasification units (FSRU) and three land-based regasification terminals, which will enable the receipt of over 40 billion m^3 of LNG by 2027 [source 9]. Additionally, Italy and Greece are each equipping two FSRUs, while the Netherlands and France are working on one each [source 10].

Not all declared capacities will come to fruition. Currently, market players have only reserved a portion of the commissioned and under-construction capacities. Nonetheless, Europe has unmistakably made a significant shift in favor of LNG imports. This shift will facilitate the development and expansion of the natural gas market through contracts for sale, resale, import, supply, storage, and re-export of gas. In 2023, the world is expected to see only 5.8 million tons of new natural gas liquefaction capacity being put into operation: Indonesia (3.8 million tons), the Republic of Congo (0.6 million), and Mexico (1.4 million, with gas supplied from the USA via pipeline) [source 11]. Plans for 2024 include 9.1 million tons: Mauritania/Senegal (2.5 million) and Russia (6.6 million) [source 11].

The European Union is actively exploring opportunities to increase LNG imports, including from the Mediterranean and Africa, as well as re-exports through Turkey. In January 2023, Bulgaria's state-owned company *Bulgargaz* signed a 13-year agreement with Turkey's *BOTAŞ*, under which it gained access to five Turkish liquefied gas terminals and a network of gas pipelines. The agreement will allow Bulgaria to annually purchase 1.5 billion m^3 of gas through Turkish infrastructure [6]. If there is demand, supplies through Turkey can be increased [7]. In April 2023, the first LNG deliveries from American company *Cheniere Energy Inc.* to Turkey began, serving the interests of Bulgarian buyers [8]. In 2022, the total capacity of four Turkish regasification terminals (approximately 22 million tons per year) was utilized at less than 50%. In principle, Turkish gas re-exports to Bulgaria and other EU countries can be increased without additional capital investment by increasing capacity utilization. Both Bulgaria and Turkey are implementing plans to significantly expand the capacity of gas storage facilities, which increases the importance of connecting the two countries for gas entry into the European market [9].

Egypt has two gas liquefaction terminals with a total capacity of 12 million tons per year, which receive raw materials from the Zohr field and from Israel. In 2022, Egypt exported about 8 million tons of LNG, more than half of which to the EU and the UK. If an agreement is reached with Israel to receive additional gas from 2025, Egypt can begin to export about 11 million tons. Egypt's gas exports are roughly evenly divided between long-term contracts and spot deals [10]. At the close of 2022, Europe received its first gas supply from the *Eni Coral Sul LNG* floating plant in Mozambique with a capacity of 3.4 million tons per year. The entire volume is purchased by *BP* under a long-term contract [source 12].

It is obvious that the planned additional volumes of LNG are not sufficient to maintain the balance between gas demand and supply in the EU

in 2023 at the 2022 level. Therefore, this year one should expect a large-scale redistribution of global gas flows in favor of Europe from other regional markets, as already observed in 2022. The United States, for example, increased its total LNG exports by only 8 billion m^3, while its American supplies to Europe increased by 28 billion m^3. In 2023, LNG exports from the United States are projected to increase by 18 billion m^3 (Fig. 2). At present, the vast majority of this volume has been contracted by Asia-Pacific countries, primarily China.

RISKS OF HIGH PRICES AND STRONG GLOBAL COMPETITION

A significant increase in LNG imports by the European Union has shifted the global balance between the supply of liquefied gas and demand in favor of the latter. At the same time, the influence of European gas prices on their dynamics in the Asia-Pacific region has increased [11]. The ongoing real-time energy crisis in Europe and the high level of uncertainty regarding the further dynamics of gas demand and supply are contributing to heightened price volatility. There is a high probability that this will result in a new surge in LNG prices in the autumn-winter period of 2023–2024. EU think tanks do not expect price normalization in the natural gas market before 2026–2027. Although futures price curves for gas, like other raw materials, are unreliable for forecasting purposes, even in 2026 the gas price at the *TTF* virtual hub (Netherlands) could reach 410 euros per 1,000 m^3, nearly double the average during the period of 2016–2019 (Fig. 3).

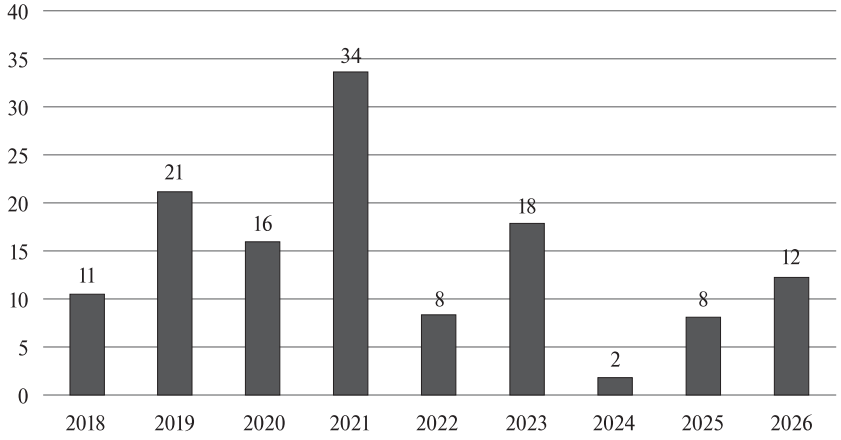

Fig. 2. USA: annual growth in LNG exports, 2018–2026 (2023–2026 forecast), billion m^3

Source: [sources 13, 14, 15].

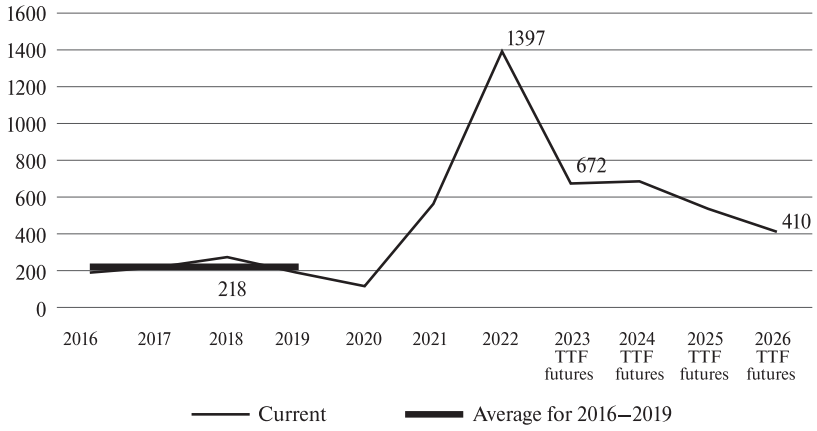

Fig. 3. Dynamics of gas prices in the EU, euros per 1,000 m^3

Source: [3].

It appears that the EU is prepared for a scenario of increased gas prices in the next two to three years. To hedge the risk of sharp price increases, the EU agreed to introduce a gas price ceiling from February 15, 2023 as part of the so-called market correction mechanism for exceptional cases:

– at a price for a month in advance at *TTF* 180 euros per 1 MWh (1,980 euros per 1 thousand m^3) for three consecutive working days;

– if *TTF* exceeds the reference price of LNG, calculated by the European Agency for the Cooperation of Energy Regulators (ACER) according to a special formula, by 35 euros per 1 MWh for three consecutive working days [source 16].

A factor of downward pressure on gas prices is the European Commission's policy of maximizing the filling of underground gas storage facilities. In 2022, it decided that storage capacity should be 80% full by November 1, and for 2023 and subsequent years this figure will be increased to 90% [source 17].

In the author's opinion, the risks of global competition for LNG are exaggerated. The Asia-Pacific countries will lose competition for LNG supplies to Europe in the next two to three years, since the latter is willing to pay a higher price. In 2022, Chinese LNG importers massively redirected gas tankers to Europe [12; sources 18, 19, 20]. India, Pakistan, and Bangladesh also were reselling LNG to Europe [13].

In the coming one or two years, China will have more flexibility in terms of LNG imports. Domestic gas production in 2022 increased by 13 billion m^3 [source 21], and the government continues to stimulate significant investments to reduce dependence on imports. China's LNG imports can be partially replaced by increasing purchases of pipeline gas from Central Asia and Russia via the *Power of Siberia* gas pipeline, which is gradually reaching its design capacity. In 2022, supplies of Central Asian and Russian gas to the Chinese market increased by 9%, or 6 billion m^3 [14].

In the medium and long term, higher prices are expected to slow down the growth of gas demand in the Asia-Pacific region at least until 2026, particularly in countries with weak balance of payments, including Bangladesh, India, Pakistan, and even China. In such a situation, it would be logical to develop non-gas power generation. China began construction of 50 GW of new coal power capacity in 2022, which is 50% more than in 2021 and a record level since 2015. Permits for the construction of coal power plants have been issued for 106 GW of capacity [source 22]. Japan and South Korea, according to the IEA forecast, will reduce gas consumption in 2023 due to the increased use of solar and nuclear energy, as well as coal, for generating electricity [source 23]. Accordingly, they will also most likely reduce LNG imports.

There is another potential for increasing global LNG supply. Utilization rates at liquefaction terminals in 2022 in Egypt, Algeria, Angola, and the United States were noticeably lower than in 2020 or 2021 [source 11]. Increasing the utilization of existing capacities, which in many cases will require minimal capital investments and operating costs, can enable the supply of significant additional volumes of LNG to the world market.

INTERESTS OF GAS EXPORTING COMPANIES

Attempts to politicize the interaction between gas importers and exporters, as exemplified by joint statements from the EU and the United States on energy cooperation [source 24], will continue, but are unlikely to have a significant practical effect. Exporting companies operate in a market coordinate system and are ready to participate in the process of transformation of the European natural gas market only to the extent and in the format that aligns with their interests. These companies are well aware of the system of restrictions and opportunities that EU energy policy presents to them, and they carefully weigh their risks. The risks of operating in the European gas market are hedged by concluding long-term contracts for gas exports on a "take or pay" basis. In 2020–2022, American gas producers have concluded long-term contracts for the export of LNG to Europe with a total volume of only 19 billion m^3 per year (Fig. 4). Gas exporters from Qatar, Australia, and the UAE are and will continue to work with European importers under similar long-term "take or pay" contracts [15; 16; source 26].

For their part, the largest European companies – producers and sellers of electricity – have hedged their risks by concluding similar contracts for the import of American LNG. Moreover, on

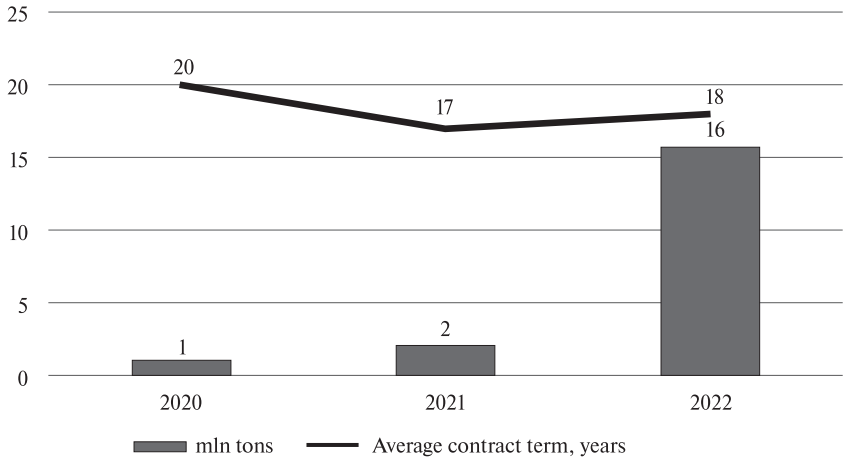

Fig. 4. Long-term contracts for the export of American LNG to Europe, concluded in 2020–2022

Calculated according to: [source 25].

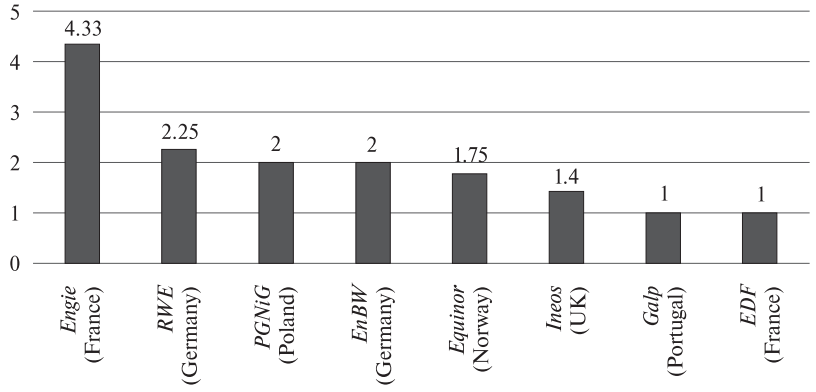

Fig. 5. European companies that have entered into contracts to import American LNG to Europe in 2020–2022, million tons

Calculated according to: [source 25].

average, European companies committed to purchase only 2 billion m^3 of gas per year (Fig. 5).

Some analysts believe that the EU countries are not very well prepared for the difficult winter seasons of 2023 and 2024, since they have not concluded long-term contracts to import sufficient volumes of natural gas [17]. As noted above, European politicians are consciously taking risks and are willing to pay higher prices for gas imports. The fundamental goal of the EU and the largest countries in the region is to speed up the energy transition. Abandoning the spot model of organizing the gas market in favor of long-term contracts will slow down the exit from gas-based electricity generation. Exporters and importers could enter into long-term contracts for LNG trade if they received clear market signals or recommendations from the European regulators for this. In the absence of both, gas exporting companies continue to be very cautious about concluding new long-term contracts. They are quite happy with working on the spot market with its elevated prices.

It should also be noted that the so-called portfolio players in the LNG market, that is, companies that form large, geographically diversified portfolios of gas contracts, concluded in 2020–2022 long-term contracts for the supply of American gas to Europe with a total volume of 30 billion m^3 per year (Fig. 6). Although many of them will begin operating in 2026, some gas will reach the European market earlier. This provides additional grounds to believe that the EU is preparing to go through the crisis years of 2023–2025, and from

2026 it expects to receive sufficient volumes of imported gas under spot contracts.

PROSPECTS FOR IMPORTS FROM RUSSIA

European think tanks consulting the European Commission assume that the EU will continue to import limited volumes of gas from Russia. In 2026, imports could amount to 18–29 billion m^3, depending on the scenario (Table 3). This situation is explained by the fact that some European countries continue to fulfill long-term contracts with *Gazprom*. Moreover, in April 2023, Hungary reached an agreement with Russia regarding possible additional gas supplies throughout the year in addition to previously contracted volumes and also secured a deferment of payments under these contracts [18].

The complete dismantling of long-term contracts for the import of Russian pipeline gas raises concerns about the sustainable operation of a number of European gas pipelines. In particular, the *OPAL* and *EUGAL* gas pipelines are designed to transport gas from Russia coming to the German *Greifswald* hub to the Czech Republic and Austria. Since 2017, *Gazprom* has reserved pumping capacity throughout the gas transport system of Germany and more than 80% of the capacity on the border of Germany and the Czech Republic until 2025. Even in the absence of Russian supplies, other potential gas transporters are required

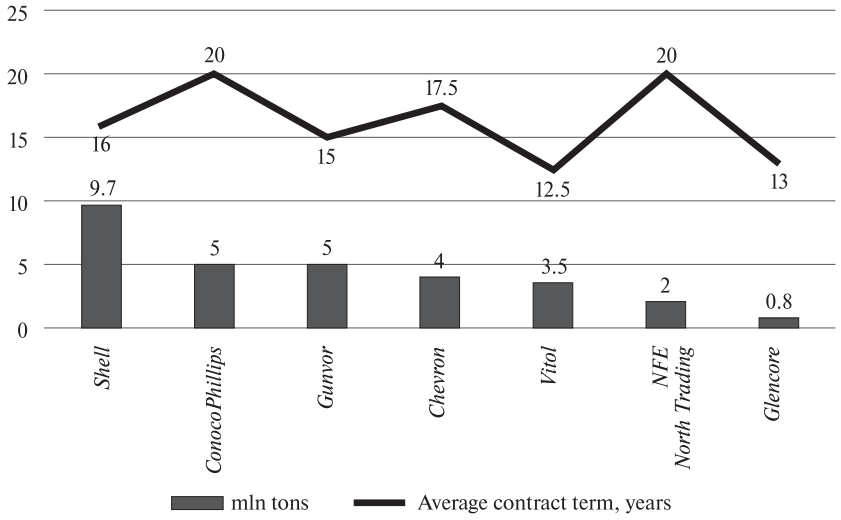

Fig. 6. Portfolio players in the LNG market that have entered into contracts for the import of American LNG to Europe in 2020–2022, million tons

Calculated according to: [source 25].

Table 3. Scenario estimates of natural gas imports by the EU-27 and the UK, billion m^3

Country	IEA scenarios								
	Basic (*STEPS*)			Announced Pledges Scenario (*APS*)			Net Zero (*NZE*)		
	2026	2030	2035	2026	2030	2035	2026	2030	2035
Russia	29	22	38	23	21	23	18	26	15
Norway	120	106	75	113	96	70	106	95	63
USA	115	114	127	94	47	47	78	23	23
Qatar	24	29	17	20	20	23	21	19	12
Northern Africa	38	31	19	40	36	10	38	30	18
Other countries	26	31	36	32	19	22	33	15	34
Total	352	333	312	322	239	195	294	208	165

Source: [3].

to buy capacity from *Gazprom* or terminate existing contracts.

The governments most ardently in favor of curtailing gas ties with the Russian Federation believe that monthly purchases of pumping capacity from *Gazprom* are unreliable and undermine the energy security of Germany and the EU. In particular, Russian gas should be replaced by LNG imports through the *Lubmin* floating regasification terminal, launched in January 2023, with a capacity of 5.2 billion m^3 per year [19]. In December 2023, the commissioning of a second floating terminal is planned, which will increase the regasification capacity to 13.2 billion m^3 per year [20]. In order to switch to LNG, Germany will have to nationalize gas pipelines and then transfer them to private companies. Setting aside the political and legal aspects, it is worth keeping in mind that such radical steps can undermine the sustainability of the gas pipeline business model, since the operating company must be guaranteed to make a profit even in the event of downtime.

Starting in 2025, uncertainty regarding the supply of Russian gas to the EU will further increase due to the termination of the contract for gas transportation through the territory of Ukraine. According to the current contract, in 2020–2024, *Gazprom* shall supply 40 billion m^3 of gas per year through the Ukrainian territory on a "pump or pay" basis [sources 27, 28].

There is a growing degree of uncertainty regarding the prospects for exporting LNG to Europe from Russia, which is not yet subjected to sanctions. Germany aims to advocate for a halt in the import of Russian LNG [source 29]. The Spanish government has advised companies against signing new contracts with Russian LNG suppliers [21]. The government of the Netherlands went further and banned the signing of new contracts for the import of Russian LNG and is looking for ways to terminate previously signed ones [22]. The European Commission is seeking legal grounds for member states to cease importing Russian LNG without announcing new sanctions. It is proposed to use temporary bans on Russian LNG to reserve capacity in the European infrastructure for regasification and transportation of regasified gas [23, 24]. EU Energy Commissioner Simson is actively lobbying the idea of refusing to import Russian LNG and seeking new contracts for its supply [source 30].

RESULTS AND CONCLUSIONS

The analysis demonstrates that even in the absence of new exogenous shocks, the European gas market will return to a relatively balanced state no earlier than 2026–2027. The policy of the European Commission and the largest EU countries is aimed at reducing the demand for Russian gas as significantly as possible and displacing it from European gas consumption. From an economic standpoint, such a policy in a rational frame of reference is counterproductive. However, in the current historical context, the actions of European governments and the EU are determined not by economic, but by purely political considerations. The EU is accelerating the transition to green energy and subordinating the transformation of the regional gas market with the goal of achieving this strategic goal, regardless of the associated costs.

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