



Offset Transactions as Part of the Import Substitution Strategy for Industrial Gas Infrastructure

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Abstract

This article examines the legal and technical potential of offset agreements as a strategic tool for addressing the gasification of domestic industrial facilities under the restrictions imposed by nineteen rounds of sanctions. The relevance of this study stems from the need to ensure energy independence and sustainable development of Russian enterprises in a drastically altered foreign economic environment. The authors analyze the legal nature of offset agreements and their advantages in aligning the interests of the state (as a guarantor of demand) and private businesses (as investors and contractors), particularly against the backdrop of global gas market dynamics among producing and consuming countries. Particular attention is given to mechanisms enabling localization of gas equipment production and infrastructure construction in exchange for long-term government contracts. It is shown that this model of interaction can support the gas industry, serve as a catalyst for import substitution, stimulate interregional cooperation, and meet projected energy demand. The paper also identifies key risks and administrative barriers hindering the widespread use of offsets and offers practical recommendations for adapting this mechanism to accelerate gasification of the real sector of the economy. This study may be of interest to government officials, industrial managers, entrepreneurs, and experts in energy and public-private partnerships. The article concludes with several findings illustrated by examples.

Keywords: gasification and pre-gasification, offset transaction, sanctions-related pressure, gas production cluster, underground gas storage, Asian focus of interests

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抵消交易作为工业天然气基础设施的进口替代战略一个要素

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摘要

本文探讨了在十九项制裁措施的限制下，抵消交易作为解决国内工业设施气化问题的战略工具的法律和技术潜力。该研究的相关性取决于在外部经济环境剧烈变化的情况下确保俄罗斯企业能源独立和可持续发展的必要性。在全球天然气市场生产国和消费国之间发生的各种进程的背景下，作者分析了抵消协议的法律性质、它们在协调国家的（作为偿付能力需求的担保人）利益方面具有优势以及各种所有制形式的企业（作为投资者和执行者）。特别关注的是通过长期政府合同，实现天然气设备生产和基础设施建设本地化的机制。事实证明，这种经济实体间的互动模式能够支撑天然气行业的发展、成为进口替代的催化剂、促进区域间合作与创新应用技术的发展、确保预计的能源需求。该文还指出了阻碍抵消交易广泛应用的关键风险和管理障碍，而且为调整此类协议以加速实体经济部门的气化转型提供切实可行的建议。该出版物可能对政府官员、工业管理者以及能源和公私合作领域的专家有所帮助。文章附有结论，并辅以实例说明。

关键词: 气化和补充气化、抵消交易、制裁压力、天然气产业集群、地下储气库、亚洲兴趣矢量。

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Introduction

Following the adoption of the nineteenth sanctions package by the European Union, the number of restrictions imposed against Russia has exceeded 30,000 – a record that now ranks among the most severe in the world. Preparations for a twentieth package are already underway. The negative impact of such restrictions on any national economy is self-evident, though not always catastrophic. However, any passive or inadequate response to sanctions pressure, particularly where it affects the domestic oil and gas sector, is unacceptable. Swift and deliberate countermeasures – both symmetrical and asymmetrical, or, in diplomatic terms, even disproportionate – are urgently required.

In several recent publications, the authors have drawn attention to the strategic importance of utilizing surplus volumes of natural gas to expand gasification and gas network extension initiatives for domestic industrial enterprises across various sectors. This approach fully complements, rather than hinders, the ongoing nationwide program for social gasification [Bykov, Tsatsulin, 2025].

Currently, *Gazprom Group* and *Gazprom Mezhrefiongaz LLC* are implementing a large-scale social gasification program. As part of this initiative, approximately 1.5 million applications have been submitted to enable technical connections to gas distribution networks (GDN) for households, apartment buildings, boiler houses, and social and industrial facilities¹. Yet, the share of applications from industrial enterprises – both new and expanding – in the real sector of the economy remains extremely small, amounting officially to only a few dozen cases.

To address this low level of business engagement in submitting applications and implementing their

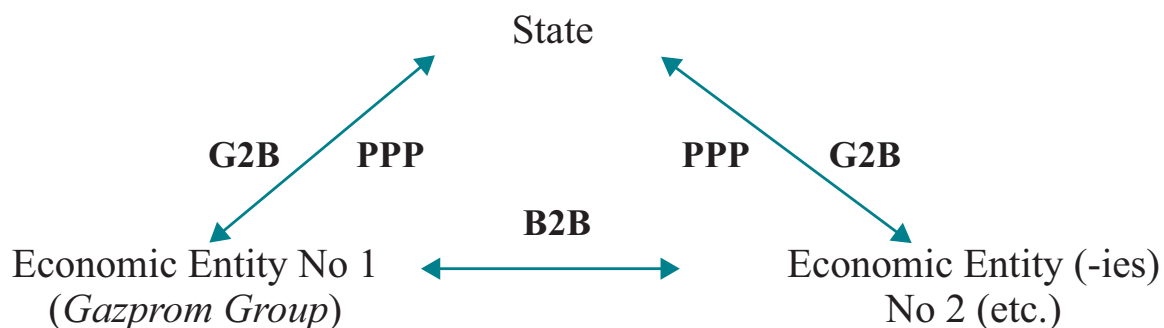
own investment projects, and to overcome widespread concerns about the financial risks of participation, the *Gazprom Group* could launch a new Industrial Gasification Program. The concept behind this initiative represents a new strategic approach that introduces an innovative organizational mechanism for cooperation – one that has so far seen limited use in domestic economic practice.

This mechanism draws on the logic of B2B partnership models but in a more complex, structured form (Figure 1), under continuous state supervision [Tretyakova, Adamenko, 2025]. It integrates key elements of public – private partnership (PPP) arrangements^{2, 3} and reflects the contractual framework of concession agreements⁴. The resulting model aligns closely with the principles of a long-term commercial agreement implemented through an offset transaction [Diveeva, 2014].

1. Problem Statement, Research Objectives, and Tasks

In the authors' interpretation, an offset transaction (also referred to as an offset agreement, contract, or arrangement) represents, in essence, the state's consent to the viability of a set of reciprocal investment obligations. Under such an arrangement, one party – the supplier – undertakes to establish or modernize its own production facilities using invested funds [Boychuk, 2025]. The counterparty commits to creating the necessary conditions for the establishment or modernization of these facilities and to providing the corresponding services while ensuring efficient and transparent use of the investor's resources. The state, acting as the architect of this framework – its initiator, moderator, and stakeholder – guarantees the uninterrupted implementation of all commitments⁵,

Fig. 1. Possible scheme of interactions between economic entities and government agencies within the framework of an offset transaction



Source: compiled by the authors.

¹ Decree of the President of the Russian Federation No. 216 of May 13, 2019 "On Approval of the Energy Security Doctrine of the Russian Federation." https://www.garant.ru/products/ipo/prime/doc/721408_84.

² The incorporation of key structural elements of classical PPP models, as well as selected features of so-called qua-si-PPP arrangements, into the offset transaction framework primarily concerns the distribution of assessed risks between the contracting parties and is shaped by prevailing legislative practices of recent years.

³ https://www.consultant.ru/document/cons_doc_LAW_182660/.

⁴ https://www.consultant.ru/document/cons_doc_LAW_54572/.

⁵ https://www.consultant.ru/document/cons_doc_LAW_144624/.

and the flexible commercialization of products, works, and services originating from modernized production sites⁶ All such outputs possess a verified and maximized localization level⁷, guaranteed over a long-term horizon of three to ten years or more.

Despite the complexity of this definition, it captures virtually all essential legal, economic, and organizational aspects, giving the proposed offset transaction the status of a nearly universal partnership mechanism – particularly relevant under the current conditions of heightened sanction pressure.

The primary objectives of launching such offset programs in the domestic gas industry include: supporting Russian businesses, promoting an active import substitution policy [Murashko, 2023], developing large-scale investment scenarios involving single or combined funding sources, creating innovative applied technologies and promising industrial facilities, generating new jobs, and forming regional production clusters. Additional aims include revitalizing and improving the industrial infrastructure and productive capacities of Siberia and the Far East, as well as ensuring workforce retention and settlement stability in the Arctic and northern territories.

Addressing these specific tasks requires close coordination with the ongoing development of the digital economy, accurate assessment of the nation's increasing energy demand, and exploration of new power generation opportunities. It must also take into account the prudent and well-regulated application of artificial intelligence (AI) technologies – whose rapid growth already entails substantial electricity consumption to remain competitive in the global AI race – while simultaneously reinforcing technological independence and advancing a consistent import substitution policy.

Within the current framework of industrial gasification and gas network extension, when an official application for the creation of a technical connection to GDN for a new or modernized industrial facility is submitted, the *Gazprom Group* proposes that such an investor-initiator enter into an offset transaction. Under the terms of this transaction, the investor undertakes, at its own expense and using borrowed funds, to construct or modernize a gas pipeline – and, if necessary, a gas distribution station – to connect its investment facility (hereinafter referred to as the investor's gas pipeline). The *Gazprom Group*, in turn, commits to purchasing the investor's gas pipeline by covering the principal of the investor's loan after the pipeline is commissioned and gas deliveries commence.

An investor who submits a proposal to *Gazprom Group* and signs the corresponding offset transaction then presents this transaction to an authorized bank for review and approval of a dedicated loan to finance the

construction and/or modernization of the investor's gas pipeline. As a result, the bank issues two loans: one for the pipeline project and another for the construction or modernization of the investor's industrial facility. With the support of the Government of the Russian Federation (subject to detailed elaboration of the specific mechanism), the loan for the investor's gas pipeline could be granted at a preferential interest rate, analogous to subsidized mortgage schemes – approximately 5–6% per annum [Kruzhkova, 2022].

This mechanism effectively eliminates the commercial risk of investment non-repayment for the *Gazprom Group* [Skripnik, 2024], since the *Gazprom Group* is not required to directly finance the construction or modernization of potentially underutilized gas pipelines. Such a risk often arises in large-scale infrastructure projects that remain unimplemented. In this case, the *Gazprom Group's* financial commitment – the buyout of the investor's pipeline – occurs only after the project's successful completion and commencement of gas transportation.

In accordance with the terms of the offset transaction, *Gazprom Group*, through *Gazprom Mezhhregiongaz*, assumes the loan principal for the completed and operational investor's pipeline only after gas deliveries have begun and payments for the supplied gas have started to flow. This approach is equally advantageous for potential investors. The existence of a signed offset transaction between the *Gazprom Group* and the investor serves as an additional guarantee and increases the likelihood of a favorable decision from the authorized bank when reviewing the investment business plan. Consequently, the investor gains access to a fully transparent credit line for project implementation.

The conclusion of such offset transactions could become a regular practice at major economic forums, conferences, regional visits by *Gazprom Group* executives, and other representational events. The key performance indicators of these transactions – including technical and economic metrics specific to the gas industry – would align with the *Gazprom Group's* strategic priorities and the broader interests of the national economy, as industrial enterprises typically require hundreds of millions of cubic meters of natural gas annually.

With active support from the Presidential Administration and the Government of the Russian Federation, the number of applications for GDN connections from prospective industrial facilities could reach one hundred per year. As a result, the domestic demand for natural gas among industrial consumers could increase by tens of billions of cubic meters annually – volumes comparable to those currently unclaimed in EU markets. One of the significant objec-

⁶ https://www.consultant.ru/document/cons_doc_LAW_116964/.

⁷ https://www.consultant.ru/document/cons_doc_LAW_183175/.

tives of this research is to quantify the gas volumes required for multipurpose industrial gasification and gas network extension of real-sector enterprises and to assess their monetization potential directly at production sites.

The calculation of expenses associated with enterprise gasification services is performed individually during the preparation of each specific project, in full compliance with current legislation⁸. Typically, the total cost depends on the selected organizational and technological system, the length and complexity of the distribution networks, the number and capacity of connected facilities, and other parameters analyzed during the design phase. In standard practice, the design stage for such industrial and energy infrastructure projects takes up to eighteen months.

2. Results

In discussing current priorities for industrial gasification and gas network extension, it is important to recognize that commercial logistics in general rely on diversifying supply routes for virtually all categories of goods, including energy resources and processed products. Such diversification is economically rational and enhances both operational and organisational resilience. Historically, Russian pipeline gas exports to Europe have been delivered via three rather winding routes. Since 2020, this system has been supplemented by an additional route with a notably complex configuration – the TurkStream pipeline.

Problems arise, however, when alternative routes are chosen not for reasons of economic efficiency but under political pressure or in pursuit of short-term gains [Mitrakhovich et al., 2022]. This was the case when Astana (Republic of Kazakhstan) decided to redirect part of its oil exports through the Baku – Tbilisi – Ceyhan (BTC) pipeline in Turkey, bypassing the traditional route via the Russian trunk pipeline network and effectively breaching existing long-term contracts.

TurkStream currently serves as a key route for the delivery of Russian gas to Europe via a hub in Turkey, which has become the largest purchaser of Russian and other gas volumes transported along this corridor. From this hub, and under the present constrained conditions, flows continue through the Balkan Stream pipeline to Greece, Italy, Slovakia, Hungary, Bulgaria, and Romania, and further on to another major gas hub in Austria.

Paradoxically, a portion of these gas volumes still reaches Ukraine via Slovakia and Hungary. According to the industry outlet *ExPro Consulting*, more than 70% of all natural gas purchased by Ukraine in 2025 is of Russian origin, with deliveries peaking in July 2025 at 568.8 million m³. Under the same geopolitical conditions, Russian gas also continues to flow to Moldova, which

Russia currently classifies as an “unfriendly” state – a vivid illustration of how complex and internally contradictory contemporary gas logistics can be.

On 31 December 2024, a pilot gas purchase for *Moldovagaz JSC* was successfully executed on the *Balkan Gas Hub* trading platform in Bulgaria. The purchased volume – 240 MWh – was transported along the Trans-Balkan corridor through Bulgaria, Romania, and Ukraine to the interconnection point Căușeni on the Moldovan border. By mid-2025, however, *Moldovagaz* had accumulated an outstanding debt of USD 709 million to the *Gazprom Group* for gas supplies to the right-bank area of the Dniester. This receivable is reflected in the financial statements of both the Russian and *Moldovan gas* companies and has not been written off.

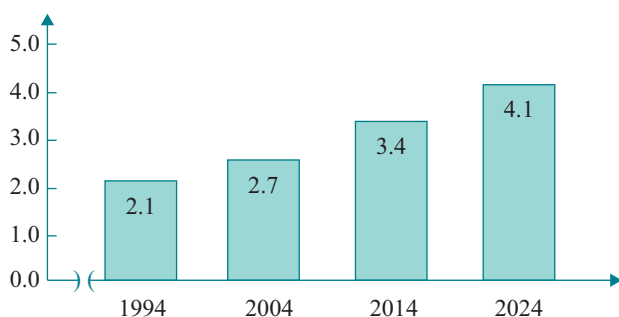
The TurkStream pipeline remains a critical route for supplying natural gas to Hungary and Central Europe, transporting up to 11.6 billion m³ of Russian gas annually. For many years, it has functioned as a dependable corridor in which operators and transit countries have largely honoured their contractual obligations and behaved in a relatively predictable manner by the standards of the international gas market. The expert community expects that all parties responsible for this logistical corridor will ensure its physical security and uninterrupted operation without deviation.

Ultimately, the broader issue of energy security is inseparable from that of national sovereignty. Any action that undermines Russian energy exports – regardless of destination – should therefore be treated as an encroachment on the country’s sovereignty and met with prompt and proportionate countermeasures. In practice, however, the responses have often been inconsistent and disproportionate, as evidenced by numerous cases that reveal either a striking lack of resolve or an almost breathtaking degree of complacency.

When assessing current gas-market conditions, it is useful to draw on hydrocarbon statistics from the Statistical Office of the European Union (Eurostat, Brussels). Over the past quarter century (1994–2024), global natural gas production has increased by 95.24%, almost doubling. This trend is illustrated in Figure 2, which presents a bar chart with ten-year intervals.

Among the leading countries in both natural gas production and consumption are Russia’s nominal – and, in some respects, strategic – counterparts, the United States, Iran, and China, as shown by the final data for 2024 in Figure 3. Taken together, these producers account for 53% of global natural gas output, while their combined consumption is close to 50% of worldwide demand. Within this group, however, only the United States and Russia produce more gas than they consume domestically – by 131 billion m³ and 153 billion m³, respectively.

⁸ https://www.consultant.ru/document/cons_doc_LAW_22576.

Fig. 2. Dynamics of global natural gas production volumes, 1994–2024 (tn m³)

Source: <https://ec.europa.eu/eurostat>.

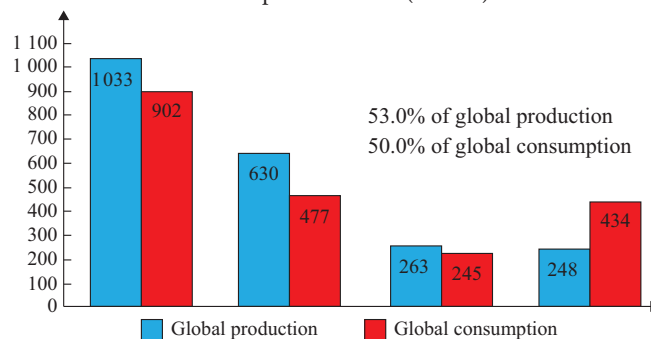
The United States is also the only one of the leading producers to register a decline in gas output in 2024: a 0.3% decrease year-on-year, and the first drop since 2000 (Figure 4). This reduction is largely linked to lower production from the Haynesville shale formation in Arkansas, driven by rising costs of shale gas extraction via hydraulic fracturing⁹ and a marked decline in spot gas prices¹⁰.

Of the estimated 153 billion m³ excess of Russian gas production over domestic consumption, part of the volumes that are not demanded on external markets due to extensive EU restrictions could be redirected to industrial gasification of domestic enterprises in Siberia, the Far East, and other Russian territories with acute socio-economic development needs, including via offset gasification transactions.

In the years preceding the special military operation, Russian gas exports averaged slightly above 20% of total production. In 2024, gas output reached 685 billion m³, of which 514 billion m³ was consumed domestically. The remainder was allocated to storage (replenishing reserves) and exports, including LNG supplies, amounting to 13.27% of total production – significantly below the share observed in earlier “boom years.”

Against the backdrop of rapidly growing domestic energy demand – driven by the digitalisation of the economy, the expansion of large data centres (LDCs), the widespread legalisation of cryptocurrency mining (“white mining”), and the implementation of the industrial gasification programme – the search for additional electricity generation sources becomes critical. The Energy Strategy of the Russian Federation envisages achieving an aggregate installed capacity of 88.5 GW from all generation sources by 2042.

In this context, a comprehensive assessment of options for increasing the role of natural gas in power generation is of paramount importance for the Russian economy. Emerging surplus gas volumes need to be monetised

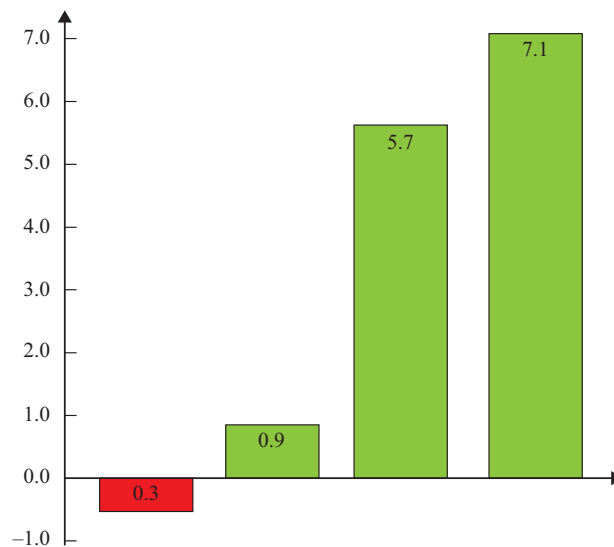
Fig. 3. Countries leading in natural gas production and consumption in 2024 (bln m³)

Source: <https://ec.europa.eu/eurostat>.

domestically – through industrial gasification initiatives and by converting most thermal power plants (TPPs) and combined heat and power plants (CHPPs) to cleaner gas-fired operation, alongside complementary measures. A telling international benchmark is the Islamic Republic of Iran, which, despite decades of comparable sanctions, uses 15% more natural gas than Russia for energy production – as shown in Figure 5.

Russian transport companies have recently begun to show heightened professional interest in the availability of surplus natural gas, particularly as a motor fuel. As representatives of the Federal Agency for State Reserves have figuratively noted, the sector is preparing for a large-scale “shift to gas,” with increasing attention to fuels such as ethane, methane, propane – butane, methanol, hydrogen, and other combustible gaseous options.

Fig. 4. Growth rates of annual natural gas production among the leaders of the global gas market, 2024 compared to 2023 (%)

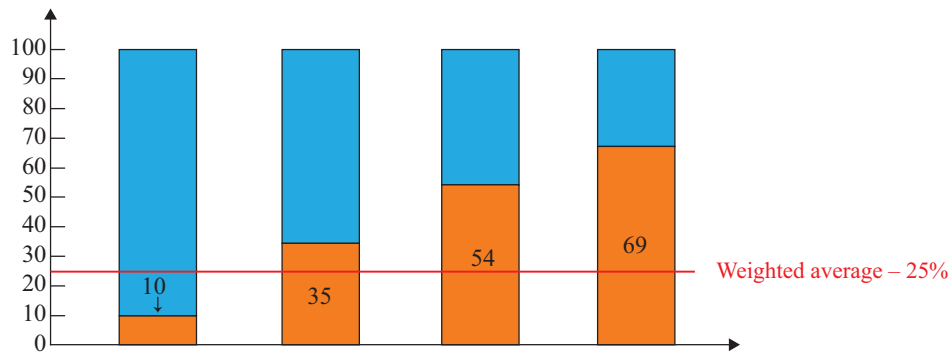


Source: <https://ec.europa.eu/eurostat>.

⁹ Hydraulic fracturing (fracking) is a method used to stimulate gas well performance.

¹⁰ Market prices for Russian gas were historically indexed to European exchange quotations.

Fig. 5. Share of natural gas in the energy consumption structure among global gas market leaders in 2024 (%)



Source: Statistical review of world energy. 74th ed. London, 2025: 38–47. <https://assets.kpmg.com/content/dam/kpmg/sk/pdf/2025/Statistical-Review-of-World-Energy-2025.pdf>.

A notable technological development was reported on 15 November 2025 by A.G. Ishkov, Head of Department at the *Gazprom Group*. According to his statement, hydrogen with a purity of 99.99%, suitable for direct use in hydrogen-powered transport, was produced at a company-owned technological facility¹¹. Unlike water electrolysis or hydrogen sulfide pyrolysis – both significantly more costly methods – this hydrogen was obtained via an energy-efficient methane pyrolysis process developed by Professor A.A. Konoplyanik [Konoplyanik et al., 2024]. The resulting product is virtually carbon-free, while the accompanying by-product, sulfur, has commercial value and is used as feedstock in other industrial processes.

The weighted average share of gas in total energy consumption across the four countries shown in Figure 5 is approximately 25%, pointing to substantial reliance on domestically produced gas rather than imports. In China, most extracted gas is used as feedstock for further industrial processing, whereas Iran primarily channels gas into electricity generation. By contrast, Russia and the United States have traditionally oriented their gas sectors toward large-scale exports. Nevertheless, during the first eight months of 2025, Russia recorded a sharp increase in electricity demand compared with the same period of the previous year. A substantial share of this additional demand was met through expanded gas-fired power generation at domestic TPPs and CHPPs, including both newly commissioned facilities and older plants returned to operation following modernization.

3. Cross-Discussion

The fuel and energy complex (FEC) remains a cornerstone of the Russian economy and one of the most attractive sectors for investment. It accounts for

approximately 20% of GDP, while total investment in the sector reached about 10.5 trillion rubles last year. Supported by rising prices for Russian crude oil and relatively stable gas prices, oil and gas revenues contributed roughly 30% of federal budget revenues in 2024. At the same time, this figure reflects an emerging long-term trend toward a gradual decline in the fiscal share of hydrocarbon revenues, partly driven by reduced gas exports to the European Union – a pattern illustrated in Figure 6 for the period 2021–2025.

As shown in Figure 6, Russian natural gas deliveries to Europe fell almost fivefold between early 2021 and early November 2025. This contraction, however, should not be interpreted in alarmist terms. Speaking at the plenary session of the St. Petersburg International Economic Forum on 20 June 2025, the President of the Russian Federation noted that “the contribution of the raw-material component to the country’s economic dynamics is no longer decisive; more-over, at the current stage it has even become negative”¹².

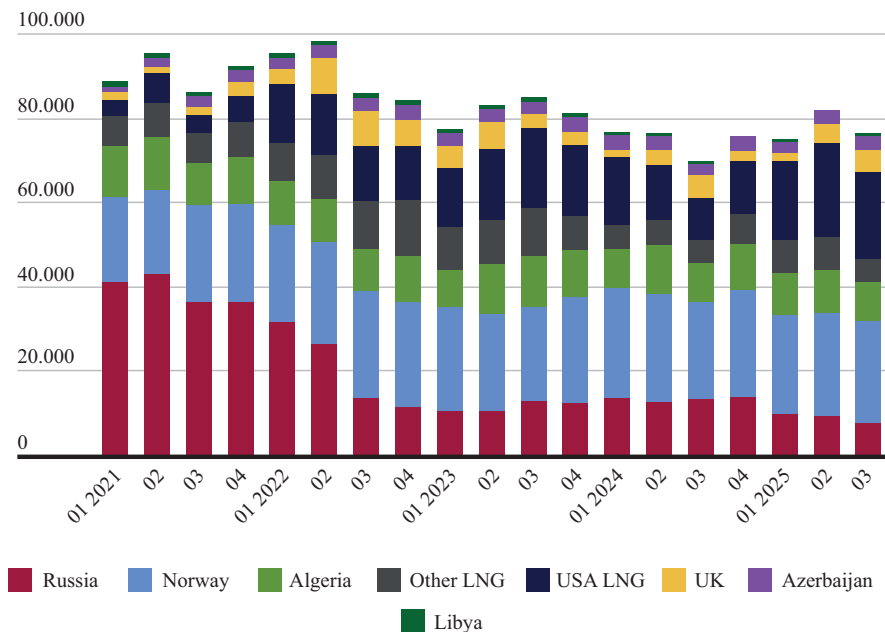
Nevertheless, the nineteenth sanctions package targeting Russian gas – both pipeline supplies and LNG – adopted on 19 October 2025, contains clear challenges and risks. Despite this, the national economy is regarded as prepared to absorb their impact. Commenting on the package, Ursula von der Leyen stated: “We are banning imports of Russian LNG to European markets. It is time to turn off the tap. We are ready for this. We have never before saved so much energy, diversified our supplies, and invested in low-carbon energy sources. Today, these efforts are paying off”¹³.

The following day, 20 October 2025, the European Union formally announced its intention to abandon Russian gas imports and adopted a long-term resolution

¹¹ <https://globalenergyprize.org/ru/2025/11/15/gazprom-nachal-issledovanija-prirodnogo-vodoroda/>. The Gazprom Group has long-standing experience in hydrogen production using alternative technologies and annually produces 150,000–200,000 tons of hydrogen.

¹² https://forums.spb.com/?lang=ru&utm_referrer=https%3A%2F%2Fwww.google.com%2F/.

¹³ <https://ria.ru/20250919/import-2042987662.html>.

Fig. 6. Gas supplies to the EU from various sources for the period from the beginning of 2021 to October 2025 (bln m³)

Source: Statistical review of world energy. 74th ed. London, 2025: 40–46. <https://assets.kpmg.com/content/dam/kpmg/sk/pdf/2025/Statistical-Review-of-World-Energy-2025.pdf>

outlining the parameters of this policy shift. According to the document, “the Council has agreed on its position for negotiations on a draft regulation on the gradual phase-out of imports of Russian natural gas. This regulation constitutes a key element of the European Commission’s REPowerEU roadmap aimed at ending dependence on Russian energy resources, in light of allegations that Russia uses gas supplies as a political instrument and has repeatedly disrupted deliveries to the EU, thereby affecting the European energy market”¹⁴.

The resolution further specifies that imports of Russian gas are to be prohibited from 1 January 2026, while a transitional regime will apply to existing contracts. Short-term contracts concluded before 17 June 2025 may remain in force until 17 June 2026, whereas long-term contracts may continue until 1 January 2028. Amendments to active contracts are permitted only for narrowly defined operational purposes and must not result in increased contracted volumes, with limited exemptions for landlocked Member States affected by recent changes in supply routes¹⁵.

According to assessments by analysts at the Institute for National Energy, including well-known energy-market experts A.S. Frolov and B.L. Martsinkevich, total LNG imports to Europe during the first eight months of 2025 amounted to 88.8 billion m³ (in regasified equivalent)¹⁶. Russian LNG accounted for 15% of this

volume, or 13.5 billion m³ (Figure 7, weekly data). By the end of 2025, Europe’s total LNG imports are expected to reach 100 billion m³, with approximately 20 billion m³ still supplied from Russia. Accordingly, by 2026, the European market will need to replace an estimated 22–25 billion m³ of Russian gas, although no official documents detailing the replacement mechanisms have yet been published. It is generally assumed that this shortfall will be covered by new production capacities in the United States and Qatar. Reductions in Russian gas imports had already been anticipated by EU institutions as early as May 2025, and by 2026 such supplies are expected to cease entirely. The dynamics presented in Figure 7 clearly point to a persistent gas deficit in the European market over the coming years.

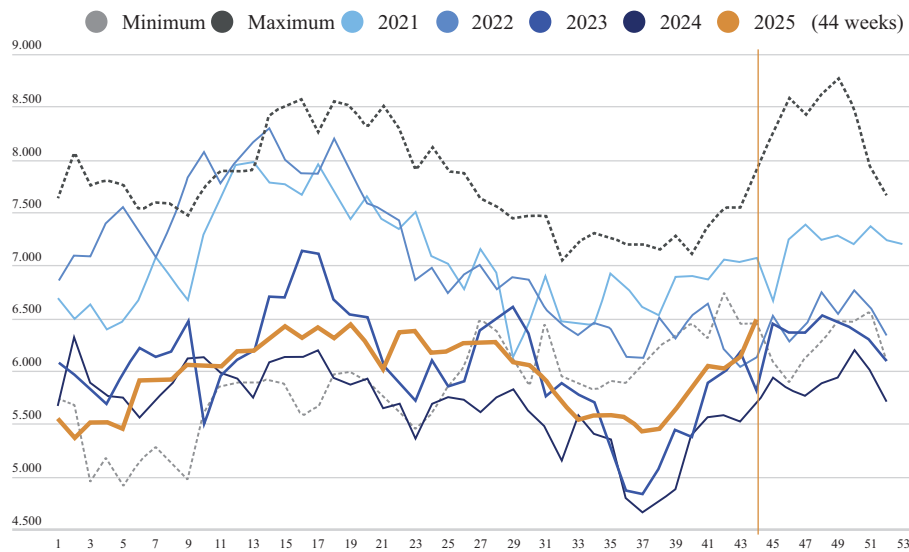
At present, Europe has become the largest consumer of U.S. liquefied natural gas (LNG), with its transportation and trading within EU member states conducted under European exchange-based pricing mechanisms. Trading companies operate as market intermediaries on the Dutch virtual gas hub Title Transfer Facility (TTF), which serves as Europe’s principal natural-gas price benchmark and one of the most liquid gas hubs worldwide.

The Energy Strategy of the Russian Federation explicitly prioritizes the use of natural gas for electricity generation at newly constructed facilities within the fuel and energy complex (FEC). According to TASS,

¹⁴ <https://www.rbc.ru/politics/20/10/2025/68f606a69a7947582a37c2e6/>.

¹⁵ <https://www.rbc.ru/politics/20/10/2025/68f606a69a7947582a37c2e6/>.

¹⁶ Regasified volumes are calculated after LNG is converted to gaseous form for grid injection; the volume increases by approximately 250–270 times during regasification.

Fig. 7. Dynamics of total LNG supply volumes to EU countries for 2021–2025, weekly (bln m³)

Source: Агентство BRUEGEL (Brussels European and Global Economic Laboratory). <https://www.bruegel.org/dataset/european-natural-gas-imports>.

the Ministry of Energy expects that forthcoming legislative amendments in the electricity sector will shorten approval timelines and reduce administrative barriers to the construction of new generating capacity. The draft regulatory framework currently under review also introduces an integrated cost-management model for electricity-sector investment projects. Achieving the projected aggregate generating capacity of 88.5 GW by 2042 will require more than 40 trillion rubles in investment in generation infrastructure and an additional 5 trillion rubles for the development of the national transmission-grid system¹⁷.

A dedicated coordination meeting on expanding electricity generation in southern Russia was recently held with the participation of representatives from the Ministry of Energy, the Gazprom Group, major power-generation companies, and regional authorities. During the meeting, participants reported to Deputy Prime Minister A. Novak on the current state of gas infrastructure and the readiness of designated sites for new generating facilities. Particular attention was given to the planned construction of TPPs in the Krasnodar Territory and the Republic of Crimea, with a combined capacity of 2.25 GW.

According to assessments by the Ministry's analytical unit, the annual gas demand required to support new generation capacity in southern Russia is estimated at approximately 4 billion m³. Representatives of the *Gazprom Group* indicated that meeting this demand will require the expansion of two existing gas pipelines, with mandatory alignment to the seven designated land

plots selected for TPP construction. Only after these conditions are met will technical specialists proceed with the development of a detailed implementation schedule.

In the Murmansk Region, gasification efforts will rely on the Volkhov – Murmansk main gas pipeline, currently under construction, with a projected annual throughput of 40 billion m³. Priority branch pipelines extending from this mainline will connect to gas distribution stations (GDSs), as well as inter-settlement and intra-settlement networks. By the end of the current year, the first phase of the project will enable 24 regional heat-supply facilities to switch to network gas, including the Apatity TPP operated by TGC-1 PJSC and facilities managed by Murmansk TPP JSC. Under the comprehensive regional infrastructure-development plan, subsequent stages will be implemented through 2036, ultimately providing full gasification of the Kola Peninsula.

At the same time, the possibility of concluding an Arctic Agreement between the United States and Russia remains hypothetical, contingent on the outcomes of the Alaska Summit. Such an agreement could, in theory, initiate energy cooperation on an unprecedented scale, contributing to the normalization of trade and economic relations and to the partial lifting of U.S. restrictions and sanctions.

From an economic perspective, this hypothetical arrangement would be advantageous for both parties. According to J. Tidmarsh, an analyst for the British journal *The Spectator* (11 August 2025), the Arctic contains approximately 13% of the world's undiscovered oil reserves (around 90 billion barrels) and 30% of

¹⁷ <https://minenergo.gov.ru/ministry/energy-strategy>.

undiscovered natural-gas reserves¹⁸. Russia exercises legal and de facto control over roughly half of these resources, which geologists estimate at 2.3 billion tons of oil and condensate and 35.7 trillion m³ of natural gas. This effectively identified “new Klondike” may be interpreted as broadly consistent with the principles underlying Donald Trump’s “America First” agenda. If U.S. expertise and capital were invested in these currently immobilized Arctic assets, the resulting economic gains could be substantial. However, with the probability of such cooperation now estimated at below 30%, ongoing geopolitical developments have largely eliminated any realistic prospects for implementing this scenario.

The development of the LNG market remains one of the key priorities of the Ministry of Energy of the Russian Federation, encompassing the development, refinement, and deployment of domestic technologies within the FEC. This focus is driven by the fact that Russia is now among the world’s leading LNG exporters, producing approximately 34 million tons annually, which accounts for about 8% of global LNG exports. According to S. E. Tsvilev, Minister of Energy of the Russian Federation, Russia’s share of the global LNG market should be substantially expanded by reaching a target output of 100 million tons of LNG per year by 2030. This ambitious benchmark, however, has prompted well-founded skepticism among gas-market experts, including the authors of the present study.

First, doubts arise with regard to the scale of the export target itself, given intensifying global competition among LNG suppliers – not only in pricing and tariffs, but also in service conditions – alongside the continued presence of sanctions and other restrictions. Second, serious technical uncertainties surround the feasibility of achieving such volumes within the proposed timeframe. The *Murmansk LNG Plant*, taking into account accumulated logistical and technological challenges, is not expected to be completed before 2032, and its current readiness stands at 22%. The completion timeline for the *Far Eastern LNG Plant* has shifted into a zone of strategic uncertainty, while media coverage of the *Baltic LNG Plant*, once regular and detailed, has effectively disappeared from public sources.

At the same time, the national gasification program continues to advance at a steady pace. Speaking at the PMG Forum 2025, A. B. Miller, CEO of the Gazprom Group, assessed the maximum achievable level of territorial gasification in Russia at 83%. The remaining 17% includes the Magadan Region, the Taimyr Peninsula, and other remote areas. As he noted: “Our primary objective is to ensure that as many Russian citizens as possible can benefit from natural gas. By order of the President of the Russian Federation, Vladimir Putin, we

are to achieve 100% technically feasible gasification of the country by 2030. This objective will be fulfilled. Gazprom is currently working on gasification projects in the southern districts of Yakutia”¹⁹.

Overall, the pace of capacity development for gasification can be described as satisfactory, with particularly notable progress recorded east of the Urals. In 2025, a gas pipeline was commissioned in Gorno-Altaysk (Altai Republic), supplying the city’s last non-gasified residential area – Microdistrict No. 35. In Poronaysk (Sakhalin Region), the first facility to be connected to the gas network was Boiler House No 4, which provides heat to 25 apartment buildings, approximately 20 private houses, and several socially significant institutions; gasification of the city’s central boiler house is scheduled as the next stage. Under the gas network extension program, the first residential properties were connected to gas networks in Svobodny (Amur Region) and Lomtuka (Sakha Republic, Yakutia).

The Power of Siberia pipeline serves as the backbone of the regional gas supply system. Under the program, Gazprom is completing the construction of four branch pipelines equipped with GDSs – Aldan, Aldan-2, Murya, and Chulman. From these nodes, inter-settlement and intra-settlement pipelines will extend to the city of Aldan and to settlements in the Aldan and Neryungri districts, including Leninsky, Lebediny, Chulman, Verkhny Kuranakh, Nizhny Kurakh, and Khotystyr. In the Olekminsky District, where a branch pipeline with a GDS and an inter-settlement line from the Power of Siberia pipeline are already in place, the company plans to gasify 16 rural localities. This will require the construction of additional inter-settlement and intra-settlement pipelines. At present, Gazprom continues to implement its ongoing five-year gasification program, with completion of the Iengra GDS branch pipeline scheduled by the end of 2025.

Conclusion

Summarizing the article and outlining prospects for further research, several interim conclusions can be drawn.

1. Industrial gasification projects implemented under offset transactions have proven, as expected, to be complex and labor-intensive legal, technical, and organizational – economic processes. They require not only careful consideration of numerous legal and regulatory nuances but also significant financial expenditures. However, these costs are quickly offset, even in the short term, and deliver substantial strategic benefits owing to the comparatively low price of natural gas used in production and energy-intensive industrial processes.

¹⁸ Tidmarsh J. (2025). Could the Arctic be Key to Ending the Ukraine’s War? <https://www.spectator.co.uk/article/could-the-arctic-be-key-to-ending-the-ukraine-war/>.

¹⁹ <https://www.expoforum.ru/calendar/peterburgskij-mezhdunarodnyj-gazovyj-forum-pmgf-2025/>.

2. Unlike other fuel resources, the use of natural gas does not require expensive filtration systems or other combustion-cleaning equipment [Plautz, 2024]. This contributes to improved environmental safety and preservation of the natural environment, in full compliance with the ESG sustainability standards adopted for regional and sectoral systems and AI-supported technologies. With a socially responsible and transparent contractor, the organization of continuous gas supply can be achieved with minimal time and financial costs.

3. When conducting a techno-economic analysis of offset transactions already implemented in other industrial sectors, attention should be given to groups of characteristics and factors that determine the typological classification of such contracts for analytical purposes. These include, first of all, legal and technical characteristics (features of legislative and regulatory acts, boundaries of the legal framework, parties to the transaction, its subject and object, investment volume in production creation, implementation timeline, transaction status, and the consolidated or partial liability of the parties). Another key analytical group consists of risk-related factors, encompassing identified, measured, and distributed risks, forecasted challenges, as well as potential damages and losses of varying nature and significance.

4. The identification and implementation of effective management mechanisms for these and other influencing factors will enhance the appeal of offset transactions within the framework of industrial gasification and gas network extension initiatives, help achieve the ambitious targets of the Energy Strategy of the Russian Federation, and stimulate investment activity across the national economy. A representative example of a successful offset transaction is Turkmenistan's competitive gas market project, involving the supply of steel gas pipelines, specialized technological equipment, and materials for modernization and further development of the Turkmen gas transportation system. The specific offset transaction was concluded between the Turkmen State Concern *Turkmengaz* and the *Gazprom Group* under an intergovernmental agreement on cooperation in the gas sector, valid until 2028. The constructed gas pipeline is intended to transport Turkmen gas not only to Russia, but also to Iran and Afghanistan. Under this offset transaction, *Gazprom Group* purchased 1.155 billion m³ of Turkmen gas for its own needs, while *Rostec* – through the United Engine Corporation – supplied NK-14ST industrial gas-turbine engines to drive compressor units. In turn, the *Chelyabinsk Pipe-Rolling Plant (ChTPZ)*, which itself operates on gas, produced 214 km of steel pipes worth over USD 219 million.

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