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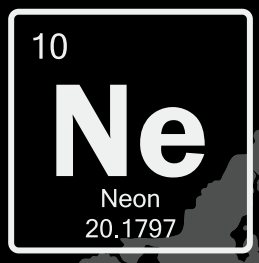
Shrouded in Neon

The Illusive Russian Inert Gas Trade



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Introduction

This report investigates how the Ukrainian company Cryoin Engineering and its Russian partner, Business Management, have evaded sanctions to continue their trade in rare gases. In 2022, both companies and their owners were prosecuted in Ukraine, revealing a network of Cypriot and Turkish entities used to bypass trade restrictions. Despite these legal actions, the companies have relocated their operations to Romania, resuming inert gas production.

The report begins by detailing the importance of rare gases and the roles Ukraine and Russia historically played in the global market. It then covers the sanctioned trade practices under investigation and concludes with an analysis of a newer, previously unexamined scheme.

How the war disrupted the rare gases market

Rare gases, or noble gases, include helium, neon, argon, krypton, xenon, and radon. These inert gases are chemically stable and resistant to reactions, making them ideal for preserving goods and manufacturing sensitive materials like semiconductors and lasers. Neon, krypton, and xenon are especially crucial in global trade and the primary focus of this investigation. Neon is vital for semiconductors and microchips, which have applications in various sectors, including the military. Krypton and xenon also play significant roles in aerospace industries.

Before the full-scale invasion, Ukraine and Russia were major players in the rare gases market. Ukraine produced a substantial portion of the world's neon and krypton, while Russia was a significant producer as well. The two countries' interdependent supply chain was rooted in Soviet-era practices, relying on large-scale cryogenic separation and fractional distillation processes to extract gases from air. Russian steel manufacturers provided raw gases, which were then refined in Ukraine.

Ukraine's historical industrial base, particularly older steel mills, supported the production of noble gases. This infrastructure, a legacy of Soviet manufacturing, was initially geared toward military applications, including the development of high-powered lasers and missiles. Ukrainian companies such as Cryoin

Engineering and Ingas were vital not only to Russian industries but also to international markets.

Ukraine accounted for around 70% of global neon production and approximately 40% of krypton. It also produced 90% of the semiconductor-grade neon used in U.S. industries, crucial for chip manufacturing and laser technologies. Major companies such as Cryoin Engineering and Ingas produced thousands of cubic meters of these gases monthly. In contrast, while Russia had its own production capabilities, its output was not as heavily emphasized in the global market as Ukraine's.

The war has severely disrupted this supply chain. Neon, a byproduct of heavy steel production in the Donbas region, has become a critical concern.The ongoing conflict has transformed this area into a war zone, marked by continuous shelling and Russian occupation.

In the wake of the conflict, trade bans were implemented. Taiwanese companies halted neon exports to Russia and Belarus, while Russia restricted neon exports to "unfriendly" countries. This sparked initial panic in the neon market, given its vital role in microchip production. Although prices have since stabilized, Chinese and Korean companies have gained a larger share of the market. Xenon and krypton have also attracted greater attention, particularly xenon, which is crucial for spacecraft fuel—an area of significant interest for Russia.

Military use of rare gases in Russia

Rare gases play a strategic role in military applications. Neon powers high-intensity lasers used in targeting systems and range finders, while its high-voltage indicators assist in monitoring military equipment. Krypton is used in specialized vehicle and aircraft lighting to aid visibility during operations and is employed in precision targeting systems. Krypton isotopes are also used to detect clandestine nuclear activities, providing critical intelligence.

Xenon is essential for ion thrusters in spacecraft, making it crucial for military satellites and UAVs. Its properties are also ideal for searchlights and other illumination systems used in military operations. Both xenon and krypton are integral to laser technologies, enabling various military functions and contributing to the production of small satellites with potential military applications.

The war has highlighted the strategic importance of noble gases in modern warfare, as countries secure supply chains against disruptions. Russia's dependence on rare gases continues to evolve in response to interruptions in supplies from Ukraine. The current demand for neon, krypton, and xenon reflects both military and industrial needs, set against the backdrop of increasing international sanctions and shifting global supply pressures.

To mitigate shortages and safeguard national security, Russia has pivoted toward greater self-sufficiency in rare gases. As global demand increases, Russia's position as a supplier may evolve, especially as it strengthens relationships with non-Western countries while navigating complex geopolitical challenges. However, obtaining reliable procurement data has become more difficult due to Russian government restrictions on public access to information regarding critical goods, including xenon and krypton.

Case study: Cryoin Engineering

Prosecution history

According to the official prosecution that formally started on 16 September 2022 (court document), **Cryoin Engineering** had been evading sanctions imposed since the beginning of war. In 2022, Cryoin Engineering imported rare gases to their long-standing partner in Russia, **Business Management LLC**, for the sum of approximately 1 million US dollars (court document). As noted by the prosecution, Business Management supplied rare gases to the manufacturers that belong to the Russian military sector[1].

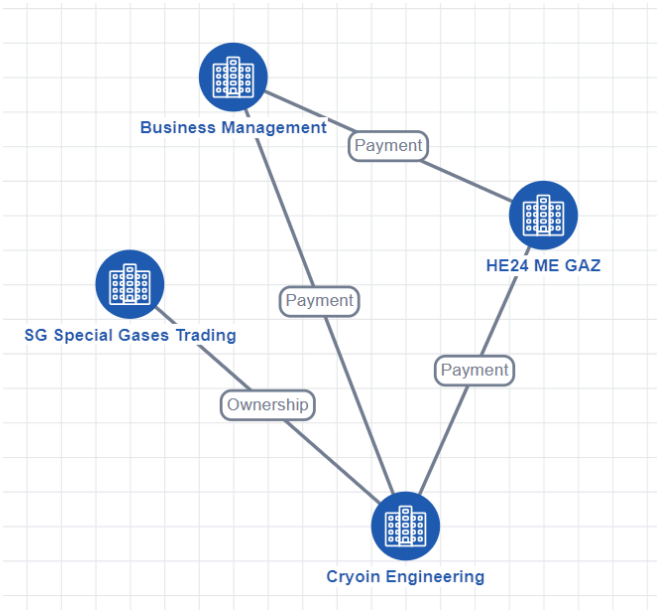
- There were not only business connections between Cryoin Engineering and Business Management. One of the owners of the former is **Larisa Bondarenko**[2], and the owner of the latter is **Vitaly Bondarenko,** who is her father. Originally from Odesa, he, just as his daughter, holds a Russian passport and has been working as the head of the cryogenic engineering faculty of the Bauman Moscow State Technical University. He has been a well-known figure both in Moscow, which we elaborate on in Section 3, and

[1] According to the information available, it happened before the war; however, the official data may not be very accurate, and in April 2024, the Russian government forbade disclosure of procurement information on strategic resources, including rare gases.
[2] According to the registry data and court documents, Larisa Bondarenko was an ultimate beneficiary of Cryoin Engineering from 23 June 2016 to 06 June 2022.

Odesa, and he is an influential academic in his field. As Section 2 will show, all key companies in the sanctions evasion scheme are connected to Vitaly Bondarenko, albeit in different manners.

To evade sanctions, Cryoin Engineering used a Turkish company, **HE 24 ME GAZ (Turkey)**. As the official prosecution states, on 30 March 2022, the participants of the above-mentioned criminal scheme (Cryoin Engineering, Business Management) established the company as an intermediary, which helped evade sanctions (court document; trading data).

Another actor in the scheme is **SG Special Gas Trading** (Cyprus), an offshore company which is also an ultimate beneficiary of Cryoin Engineering. They participated in shipments and handled financial transactions. Below you can find an illustration of this sanctions evasion scheme.

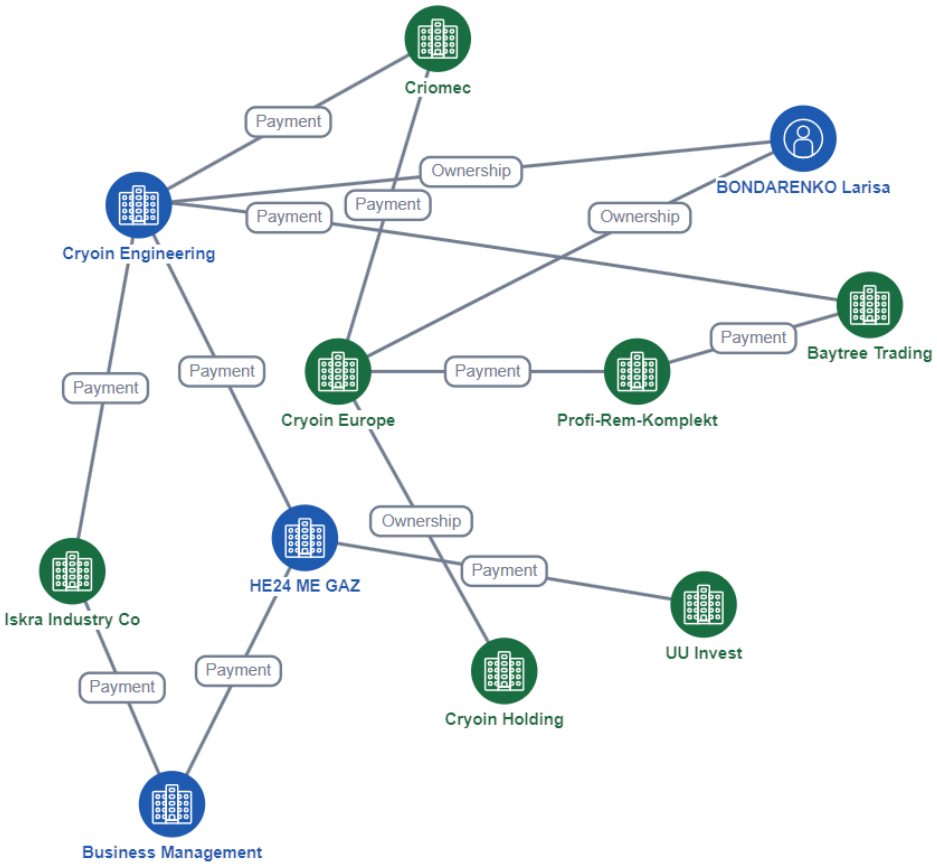


Looking for workarounds

While the prosecution has been underway since at least September 2022 and the property arrest was issued in February 2023, Cryoin Engineering continued to trade with the Netherlands, USA, Germany, Poland, and other countries in 2022 and 2023. The latest record of Cryoin Engineering trading is from 15 September 2023. (See trading data). The latest record of HE24 ME GAZ trading is from 27 December 2023.

However, they also began to explore new routes and establish new companies. On 30 June 2023, the **Cryoin Europe** company was founded in Romania. It has been trading with two companies: a newly-formed **Rem-Profi-Komplekt** from Odesa (see trading data) and another Romanian company, **Criomec**, which was founded 1994.

On a diagram below, new companies introduced in this part, which were not mentioned in the official investigation, are colored in green.



The owner of Cryoin Europe is **Cryoin Holding**, a Cypriot company that has the same director as SG Special Gases. Her name is **Elena Denisenko** (also spelled Ntenisenko). According to the official documents (view source, p. 64), the ultimate owner of Cryoin Europe is Larisa Bondarenko (Cryoin Engineering).

Remarkably, Rem-Profi-Komplekt and Cryoin Europe were incorporated just as the court decisions against Cryoin Engineering and SG Special Gases Trading were rendered. Moreover, the court document from 11 April 2023 reveals that Cryoin Engineering intended to relocate the equipment despite the confiscation order issued by authorities. If we examine the trading data between Rem-Profi-Komplekt and Cryoin Europe, their trade actually started with equipment needed for rare gas production.

2023-01-26 Start date	Start of prosecution against Cryoin Engineering
2023-04-05 Start date	Supply of gases to Cherkassy Criminalistics Center
2023-04-07 Start date	Decision on seizure of property of Cryoin Engineering
2023-04-26 Incorporation date	Profi-Rem-Komplekt
2023-05-18 Start date	Supply of gases to the Odessa Criminalistics Center
2023-06-09 File date	Search warrant on Oleksandr Shishov
2023-06-30 Incorporation date	Cryoin Europe
2023-07-01 Start date	Introduction of sanctions against SG Special Gases Trading

Above, you can find a fragment of the timeline that shows legal measures against Cryoin Engineering and the incorporation of several companies in Ukraine and Romania.
According to the trading data[3], the only other trading partner of Rem-Profi-Komplekt was **Baytree Trading (Romanian company)**. This company was founded in November 2023 and also trades with Cryoin Engineering. It is owned by a Ukrainian national **Petro Dalakov**, who is a former student of Vitaly Bondarenko and a former employee of **Iceblik** (predecessor of Cryoin Engineering[4]).

According to Ukrainian court documents, Rem-Profi-Komplekt appealed to the commercial court of the Odesa region with a claim against the Bulgarian company Baytree Trading LLC for the recovery of **509476.89 USD.** Last

[3] It is notable how this data is presented on ImportGenius: BAYTREE TRADING LLC STR CALEA PRUTULUI NR 12800219 GALATI ROMANIA. We were not able to find a company with this name under the given address. However, there is a Bulgarian company named Baytree Trading (more on it in the main text), and the address coincides with the residence of the previously mentioned Criomec. The latter is a Romanian company that trades with Cryoin Europe and works on construction of its production site.
[4] Although the information is unconfirmed, our source in Ukraine stated that Iceblik (Odesa) was a joint venture by Vitaly Bondarenko and influential Russian businessmen close to the Kremlin. After a financial disagreement, Bondarenko opted out and formed a new company, Cryoin Engineering, where he had more control.

deliveries of inert gases dated 5 December 2023, 26 December 2023, and 30 December 2023. Baytree Trading LLC reported the impossibility of making payments under the above-mentioned contract due to an unsatisfactory financial situation**.** It also shows the connection between Ukrainian “new company” Rem-Profi-Komplekt and old players, and it proves that Rem-Profi-Komplekt sells inert gases abroad.

Another Ukrainian company that has been trading with HE24 GAZ since July 2023, is **UU Invest** (see this link)**.** After 7 December 2022, it replaced Cryoin Engineering as a Ukrainian partner of HE24 GAZ who, in turn, traded with Russia until the very end of 2023.

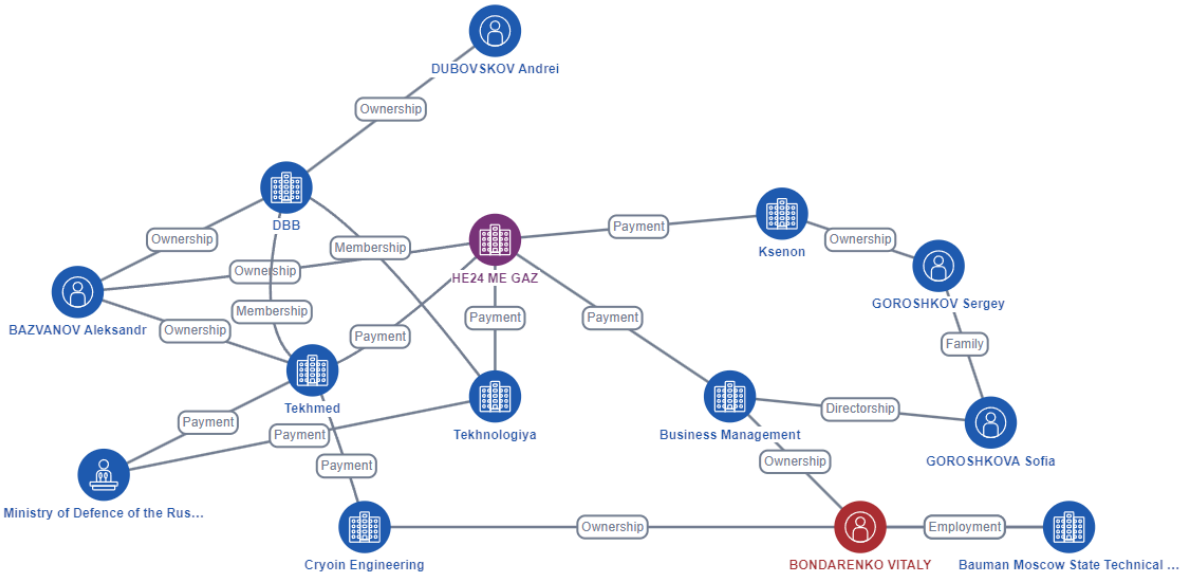
According to the Ukrainian court database, UU Invest was involved in cases concerning the supply of substandard medical oxygen to hospitals during the COVID-19 pandemic. They were also indirectly involved in cases of “financing terrorism”.

The last actor we were able to identify in this sanctions evasion scheme is a Japanese company **Iskra Industry Co. Ltd.** It has traded with both Cryoin Engineering and Business Management since before the war began. Although Iskra Industry Co. is a Japanese company established in 1960, it has been closely linked to Russia for a long time; the company was founded with the goal of trading with the Soviet Union**.** Even today, Russia remains its main trading partner.

Russian connections of Vitaly Bondarenko

As head of the cryogenic department of the Bauman Moscow State Technical University, Vitaly Bondarenko has numerous connections with the Russian establishment. His faculty took part in various large-scale governmental projects. In July 2022, a facility for the production of pure neon was launched on behalf of the Russian government on property of the Bauman Moscow State Technical University. This was personally reported to Putin by Denis Manturov, Minister of Industry and Trade, who was present at the opening.

A more detailed scheme showing links found in the investigation:



However, there is another set of Russian companies that are connected to Bondarenko via the Turkish company HE24 ME GAZ, which, according to the Ukrainian prosecution (see Section 1), was created with participation of Cryoin Engineering and Business Management to evade sanctions.

Remarkably, it is very likely that HE24 ME GAZ is also connected with the Russian oligarchs. The registering person[5] for the company's website is **Alexander Bazvanov**. He is also a director of **Tekhmed** (LLC **TechMed)** and one of the shareholders in **DBB** (more on this company below). HE24 ME GAZ was a top buyer from Tekhmed in 2023 and 2022.

Tekhmed is under sanctions by Poland. The rationale for sanctioning was that the company "[..] has long-standing trade relations with Russian energy companies and Russian military departments[6]. One of TechMed's key clients is the state-owned Rosenergoatom – the operator of nuclear power plants in the Russian Federation, which is part of the state corporation **Rosatom**. The majority shareholder of TechMed – **Andrey Dubovskov** – until 2021 was among the

[5] Bazvanov has several other websites registered to him: raregaz.com and inertgaz.com. Both are registered in Turkey and have an almost identical design. The role and activities of these companies are yet to be established.
[6] You can see the list of Tekhmed's trading buyers here: https://www.rusprofile.ru/id/6168752.

group of top managers associated with the Russian oligarch **Vladimir Yevtushenkov**. TechMed is listed as a cooperating entity with the **Ministry of Defense of the Russian Federation, to which it supplies specialized gases**" (emphasis mine).

Tekhmed is not the only company associated with Andrey Dubovskov that has been trading with HE24 ME GAZ. **Tekhnologiya**, which is part of Dubovskov's **DBB LTD**, traded with the Turkish company and had a contract with the Russian ministry of defense in 2023.

To illustrate the extent of Bondarenko's connections in Russia, one of Business Management trading partners is Ksenon (Moscow). Its owner, Sergey Goroshkov, shares the surname and a residential address with Sofia Goroshkova, who is a director of Business Management.

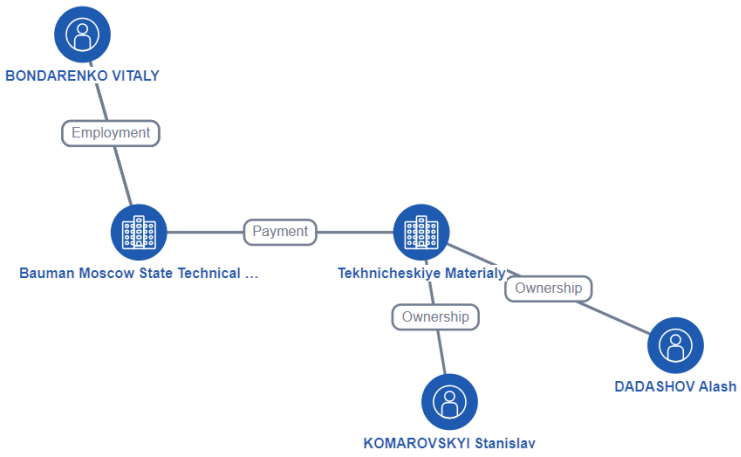
Rare gas production in the so-called DNR

Technicheskiye materialy was registered in July 2022 in Mariupol on the premises of Ingas, which is another rare gas manufacturer who fled the occupation and moved their production to Odesa. Technisheskiye materialy has two owners: **Stanislav Komarovsky**, originally from Mariupol and with 30 years of experience at Azovstal, and **Alash Dadashov**, a Chechenian who formerly served as director of the Akhmat club in Moscow, directly associated with Ramzan Kadyrov.

In January 2024, the company's website published information regarding the resumption of production, along with a job posting. In the video posted by the DNR government in December 2023, Stanislav Komarovsky stated that they sent their production to the Bauman Moscow State Technical University for research

purposes[7]. Since Vitaly Bondarenko's faculty specializes in rare gases, it is highly probable that they were a recipient of the production of Tekhnicheskiye materialy.

Diagram of the investigation showing the probable connection chain:



In July 2024, the Ukrainian ASSET RECOVERY AND MANAGEMENT AGENCY announced a competition for a manager position for the assets and corporate rights of Cryoin Engineering, as well as the seized property of its actual owners. We are still awaiting the final decision.

Conclusion

From our findings, it seems highly plausible that this sanctions evasion scheme and the actors involved in it were recently active in the regions and businesses mentioned in our report. We are also confident of the likelihood of their connections to the Russian government. Therefore, we assert that it is crucial to investigate this scheme further. Specifically, it is imperative to investigate any and all EU-based entities and their connections to this scheme and/or its actors.We encourage both official accountability groups and civil society to use the

[7] According to the company's website, another buyer of Tekhnicheskiye materialy is **Roscosmos** (Russian aerospace agency). Roscosmos particularly needs xenon and krypton, which are used as fuel for rockets. In December 2022, a shortage of xenon was reported, which was a problem for the realization of the Sfera state project. Sfera launches small satellites, which can be used for military purposes, among other things (More on military space programs 1, more on military space programs 2). Just as neon, krypton and xenon are areas of specialization and interest of Bondarenko's faculty at Bauman Moscow State Technical University, which also participates in the Sfera project. In March 2023, it was reported that Russia's first krypton-powered satellite was launched.

information uncovered by OSINT FOR UKRAINE to look deeper into this scheme.

Rare gases are a key resource for a global semiconductor production leading innovation in various spheres, including military technology. Russia's control over the captured areas with natural resources combined with the possibility to utilize its existing production chains enables it to support its war machine, leading to serious implications for global safety. Therefore, it is crucial that this sanctions evasion scheme is brought to the attention of accountability bodies and investigated further.

For more details, users with a registered account in Aleph can view a full timeline in the OFU project through this link.