Impact of the War in Ukraine and International Sanctions on Northern Sea Route Traffic and Russia's Activity in the Arctic

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This article investigates dynamics triggered by the war in Ukraine on Russia's activity in the Arctic, which over time could have serious consequences for its economy. Research is conducted through an analysis of Northern Sea Route traffic and an interpretation of its changes through connection with events that followed the start of the conflict, such as sanctions on Russia and disruptions to its Arctic projects. In order to understand the relevance of this paper, the NSR helped Russia to develop its polar territories to a level of strategic significance for its economy. Using data about the movement of the ships in the region from the Rosatom NSR General Administration website, through quantitative analysis, the article reveals dynamics of marine traffic in Russia's Arctic waters. Also, the research goes further to interpret the changes at the level of the sea route through correlation with events after the outbreak of the conflict in Ukraine, using official data, media reports, academic papers. Interpreting dynamics like NSR traffic and events before and after the war in Ukraine is a step forward to reveal the reality Russia and its economic projects are facing in the Arctic. The results of this analysis reveal a connection between changes suffered by NSR traffic and key events that occurred after the outbreak of the conflict in Ukraine. Using the process of linking quantitative and qualitative data analysis, this paper reveals how international sanctions work and how Russia tries to adapt to these challenges. Through this research I hope to contribute to discussions about Russia and the Arctic in the 21st century, providing insights about its polar transport and economy, putting everything in the context of new international conditions created by the war in Ukraine.

Introduction

Currently, Russia is a revisionist state that seeks to challenge and contest the current global order based on the respect of international norms. This aggressive behavior can be recognized through its policy of power, which it tries to project to the area that considers is its sphere of influence (Allison, 2017). One of the consequences of this political agenda is the war in Ukraine, launched by Russia on 24 February 2022. That event weakened international stability, including in the Arctic, leading the last two Arctic states, Sweden and Finland, to join NATO. The Arctic is now divided

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between two sides between Russia and NATO, with the latter now having seven members that are Arctic nations (Komin & Hosa, 2025).

The current situation is the result of Russia's post-91 evolution, in which throughout the 90s faced economic and security crises that fueled its revisionism (Pisciotta, 2019). After this period of decay, Russia experienced economic growth in the 2000s generated by an orientation towards the exploitation of natural resources such as gas and oil, which stabilized its economy and consolidated the power necessary to return on the international stage (Gaddy & Ickes, 2013).

In this context, natural resources were the key element that stabilized the Russian economy, given that in some years they generated over 50% of the country's federal budget (Yermakov, 2024). However, large-scale exploitation during the 2000s led to the rapid exhaustion of existing exploited deposits, orienting the Russian energy companies towards huge fields of natural resources in the Arctic, which are becoming accessible due to global warming (Petrov, 2010). The official orientation was marked in 2008, through the adoption of the "Principles of the State Policy of the Russian Federation in the Arctic to 2020 and beyond." This paper sets the transformation of the Arctic territories into a resource base of strategic importance through regional stability, environmental protection and the use of the NSR as national communication line (The Russian Government, 2008).

Over time, Russia pursued the implementation and achievement of these strategic priorities through a series of actions. In order to maintain regional stability, it consolidated its military presence to create a security environment favorable to the development of its polar territories. Furthermore, it protected the environment by implementing a special navigation regime at the level of the NSR, through which it exercises control over traffic in these waters. Additionally, Russia used the corridor to develop the exploitation of its polar territories at an industrial scale and to ship the natural resources from this region to the markets in Asia and Europe (The NSR General Administration, 2020).

Following the implementation of the policies for the Arctic, the NSR had an important role in the development of the Russian Arctic territories, becoming a core element of the transport network in the region. In 2013, the corridor was positioned as the central component of a unified transport system in the region for the movement of natural resources to world markets and international transit shipments. This network is envisioned as operating year-round and integrating with all modes of transport: rail, road, river, air, and sea. The transformation is described as materializing under Russian control, with the participation of enterprises and investors involved in the exploitation of natural resources, contributing to the development of a future international maritime corridor (The Russian Government, 2013). The most well-known of these companies and projects in the Arctic are Gazprom (Bovanenkovo and Prirazlomnoye), Novatek (Yamal LNG), Rosneft (Vostok Oil), and Lukoil (Varandey) (Vakulenko, 2025). To understand the significance of Russia's polar extraction industry, it generates 11% of the country's entire gross domestic product and a large part of the federal budget (Laruelle, 2020). Therefore, the Arctic territories are part of the means that are the basis of Russian economy and contribute to the consolidation of the power with which it exercises its interests at the international level. All of these developments became possible due to the polar maritime transport network that facilitated the development of natural resource exploitation on an industrial scale, having the NSR as its center.

Northern Sea Route

The Northern Sea Route (NSR), is a part of the Northeast Passage that facilitates the connection between the Atlantic and Pacific through the waters found along the coastline of Northern Norway and the Russian Federation. This passage is identified as a shorter, but seasonal alternative to the maritime corridor between Europe and Asia through the Suez Canal. The NSR lies within Russia's northern coastline, between the straits of Novaya Zemlya Archipelago and Bering Strait, encompassing Kara, Laptev, East Siberian, and Chukotka seas (Rosmorrechflot, 2012). Due to its geographical positioning, the passage presents a series of extremely harsh conditions. This is the reason why it has a special navigation regime and requires ships with capabilities for operating in frozen waters. Based on UNCLOS 1982, Russia has managed to impose a strict navigation regime at the level of this passage, based on which it exercises control over it (Solski, 2010).

Against the backdrop of climate change and the economic evolution of Russia in the latest decades, the passage has been engaged in the maritime transport network vital for the development of the Russian Arctic after the region was identified in 2008 as the country's strategically important resource base. By developing the transport network between Murmansk in the West and Vladivostok in the East, with the NSR at its center, the Russian state aims to transform it into a global maritime corridor and reach the true potential of its polar territories by harnessing their resources (The Russian Government, 2020).

However, in the context of the conflict in Ukraine, maritime traffic at the level of the NSR underwent a series of new dynamics as a result of the sanctions and measures taken by the states that condemned Russia's actions (Vakhrusheva et al., 2025). The sanctions led to the withdrawal of several types of vessels vital to economic activities in the region. In order to understand how traffic was affected, it will be analyzed, given that ships are the key element that facilitates the functioning of the economy in the region.

Analysis

Analysis of NSR traffic is possible due to the unique characteristics of the passage, which has a strict regime of exercising control over navigation in the region by the Russian state (for safety reasons and the protection of the environment) (Wani, 2023). The control consists of imposing a set of navigation rules including the task for any ship operating under Russian or foreign flag to notify its presence in the waters of the corridor. The presence of vessels is recorded in the registry of the state institution, the Northern Sea Route General Administration of Rosatom, which has the authority for the organization and management of navigation on the maritime passage (The NSR General Administration, 2026).

The registry was public and contained data related to ships that moved through this corridor, including details related to the name of vessels, IMO number, position (latitude and longitude), speed and the date of recording of this information. The analysis was conducted based on data extracted from this registry using the extract data function of the Microsoft Excel program. Through this process, it was possible to determine a series of characteristics related to how the maritime transport infrastructure in the Arctic territories of Russia works and is structured, quantifying the total number of records of ships per year, types of vessels, and the flag under which they operated. The research was carried out over four predetermined years, from 01.01.2020 to 31.12.2023, respectively two years before the outbreak of the War in Ukraine and two years after,

through a comparison between the two periods to identify changes that occurred at the level of NSR traffic and the development of the Russian arctic territories which are closely linked to it (The NSR General Administration, 2024).

Unfortunately, a longer timeline analysis for 2024 and 2025 is not possible because Rosatom discontinued providing information about ship movement along NSR, and the actual research is possible because the data was saved and stored before it was removed from Rosatom website. Based on data collected from this registry, the following general characteristics were determined.

The total number of movement records per year were as follows: 2020 – 8268; 2021 – 10081; 2022 – 10196; 2023 – 14409. Interpreting these details, it can be determined that from one year to another the total number of ship recordings has increased, and comparing the first two years with the last two years, there was an increase in 34.09% of the total number of recordings, respectively after the outbreak of the War in Ukraine. These recordings include all ships that operated in NSR waters, Russian and foreign, comprising international and cabotage voyages, but does not include information related to points of departure and destination of recorded vessels. For this reason, this research could not determine the number of international and cabotage voyages (The NSR General Administration, 2024).

The total number of unique ships recorded per year were as follows: 2020 – 388; 2021 – 445; 2022 – 344; 2023 – 387. Interpreting these details, it can be determined that in the years before the war, a higher number of unique vessels was recorded, the most being in 2021, and the fewest in the year in which the conflict broke out (2022). Comparing the first two years before the war with the two after, it can be determined that the number of unique ships decreased by 22.69%, or 101 vessels (The NSR General Administration, 2024).

Flag States

Based on data from above, a series of characteristics of the NSR could be determined by identifying the flags under which the vessels operated in the region. In the period between 2020 and 2023, ships on the NSR operated under 31 different flags, including Russia. Under the Russian flag, the following number of vessels operated: 271 vessels in 2020, 316 in 2021, 301 in 2022 and 320 in 2023. Based on these figures, in the 2020-2021 period, there was an increase in the number of ships, in 2022 a decrease, then an increase over the pre-conflict recorded values. Excluding the Russian flag, by year, in 2020 ships operated under 24 flags, 22 flags in 2021, 12 flags in 2022 and 13 flags in 2023. Reviewing these details, the number of foreign flags under which ships operated in the region almost halved after the outbreak of the War in Ukraine, recording a 45% decrease from 2021 to 2022, remaining as low in the following year at only 13 flags (The NSR General Administration, 2024).

Table 1. Flags identified on the NSR between 2020-2023

	Flag	2020	2021	2022	2023
1.	Russia	271	316	301	320
2.	Panama	4	3	1	7
3.	Bahamas	9	9	7	8
4.	Barbados	3	3	1	4
5.	St Kitts & Nevis	1	0	0	0
6.	Antigua & Barbuda	1	2	0	0
7.	Curacao	0	1	0	0

8.	Wallis Futuna	1	0	0	0
9.	Marshall Islands	11	14	5	6
10.	Palau	1	2	0	0
11.	Tuvalu	1	0	0	0
12.	Australia	1	0	0	0
13.	Netherlands	20	23	1	0
14.	Portugal	9	11	0	1
15.	Norway	9	5	0	0
16.	Denmark	2	1	0	0
17.	Belgium	3	4	0	0
18.	Luxembourg	1	2	0	0
19.	Cyprus	13	12	8	7
20.	Malta	1	2	1	2
21.	China	7	10	0	6
22.	Hong-Kong	7	8	7	8
23.	Singapore	2	4	1	2
24.	Malaysia	1	1	0	0
25.	Kazakhstan	0	0	1	0
26.	Cameroon	0	0	0	1
27.	Tanzania	0	1	2	0
28.	Comoros	2	1	0	0
29.	Togo	1	0	0	0
30.	Liberia	6	10	8	7
31.	Gabon	1	0	0	8
	Total	388	445	344	387

Note. Data from *NSR General Administration* (The NSR General Administration, 2024)

Comparing the period of time before the outbreak of the conflict and after, excluding the Russian flag, in 2020-2021, vessels operated under 28 different flags and in 2022-2023 operated only under 16 flags. Based on these details, the conflict in Ukraine had a strong impact on the number of foreign vessels that operated in the region, resulting in a difference of 12 flags between these two periods of time, a decrease of 42% (The NSR General Administration, 2024).

Excluding the Russian flag, the top five flags recorded by year are: in 2020, the Netherlands (20 ships), Cyprus (13 ships), the Marshall Islands (11 ships), Portugal, Norway and Bahamas (9 ships); in 2021, the Netherlands (23 ships), the Marshall Islands (14 ships), Cyprus (12 ships), Portugal (11 ships), China and Liberia (10 ships); in 2022, Cyprus, Liberia (8 ships), Hong-Kong, the Bahamas (7 ships), the Marshall Islands (5 ships); in 2023, Hong-Kong, the Bahamas, Gabon (8 ships), Panama, Cyprus, Liberia (7 ships) (The NSR General Administration, 2024). These records present strong evidence that the vessels operated under EU flags left the Russian waters, as a result of sanctions and actions of EU countries against Russia's aggression in Ukraine.

Types of ships

Using the same records, 21 different types of vessels that operated in the NSR waters were identified: LNG tanker, oil tanker, general cargo, icebreaker, tug, passenger vessel, fishing vessel, drilling vessel, research vessel, bulk ship, rescue vessel, container ship, offshore supply vessel, supply vessel, dredging ship, sailing vessel, heavy load carrier, buoy-laying vessel, diving support vessel, cable layer vessel, and crane vessel. From the identified vessels, in the period 2020-2023 the most numerous types of ships aggregating a four-year average, were: 111 general cargo vessels, 55 oil tankers, 46 tugs, 26 LNG tankers, 23 research vessels. Based on these details, three out of the

five most numerous types of vessels recorded on the NSR were cargo ships like general cargo, oil and LNG tankers, characteristics that reveal the role of the transport network for the economy in the region (The NSR General Administration, 2024).

Table 2. Types of vessels identified on the NSR between 2020-2023

	Type	2020	2021	2022	2023
1.	LNG Tanker	26	27	26	27
2.	OIL Tanker	55	54	51	60
3.	General Cargo	110	144	103	88
4.	Icebreaker	23	21	22	24
5.	Tug	35	61	43	48
6.	Passenger	2	3	0	1
7.	Fishing	14	17	27	27
8.	Drilling	7	5	3	4
9.	Research	28	22	21	24
10.	Bulk	18	21	9	18
11.	Rescue	9	6	4	6
12.	Container	9	12	12	18
13.	Offshore Supply	21	20	13	25
14.	Supply	11	4	4	3
15.	Dredging	16	17	4	7
16.	Sailing	1	1	0	0
17.	Heavy Load Carrier	2	9	1	5
18.	Buoy-Laying	1	0	0	1
19.	Diving Support	0	1	0	0
20.	Cable Layer	0	0	1	1
21.	Crane	0	0	0	1
	Total	388	445	344	387

Note. Data from *NSR General Administration* (The NSR General Administration, 2024)

Categorization of identified types of vessels

In order to understand the dynamics of the NSR traffic, and because of numerous types of identified ships, they will be divided in four large categories: cargo vessels which include LNG tankers, oil tankers, general cargo ships, bulk carriers and container ships (5 types); support vessels which include icebreakers, tugs, rescue ships, offshore supply vessels and supply ships (5 types); specialized vessels: drilling ships, research ships, dredging ships, heavy load carriers, buoy-laying ships, diving support vessels, cable layer vessels, crane ships (8 types); vessels that are not relevant for this research: passenger ships, fishing vessels, sailing ships (3 types) (The NSR General Administration, 2024).

After categorization of the vessels, their numbers will be analyzed through a comparison of the first two years before the outbreak of the War in Ukraine and the two years after, in order to understand the changes that occurred at the NSR level.

Table 3. Cargo vessels identified on the NSR between 2020-2023

General Cargo							
2020		2021		2022		2023	
Russia	85	Russia	104	Russia	99	Russia	83
Netherlands	6	Netherlands	11	Liberia	2	Cameroon	1

Portugal	6	Portugal	10	Tanzania	1	Liberia	3
China	5	China	10	Netherlands	1	China	1
Hong-Kong	1	Hong Kong	1				
Togo	1	Marshall Isls.	1				
Comoros	1	Bahamas	1				
St Kitts Nevis	1	Antigua Barbuda	2				
Liberia	2	Liberia	2				
Singapore	2	Singapore	2				
Total	110		144		103		88
Oil Tanker							
Russia	48	Russia	48	Russia	47	Russia	46
Cyprus	3	Cyprus	2	Cyprus	2	Cyprus	2
Gabon	1	Palau	1	Tanzania	1	Gabon	7
Palau	1	Norway	1	Liberia	1	Liberia	1
Liberia	1	Comoros	1			Barbados	3
Comoros	1	Tanzania	1			Panama	1
Total	55		54		51		60
LNG Tanker							
Panama	1	Panama	1	Panama	1	Panama	1
Hong-Kong	6	Hong-Kong	7	Hong-Kong	7	Hong-Kong	7
Bahamas	7	Bahamas	7	Bahamas	7	Bahamas	7
Cyprus	6	Cyprus	5	Cyprus	5	Cyprus	5
Marshall Isls.	6	Marshall Isls.	5	Marshall Isls.	5	Marshall Isls.	4
		Russia	1	Malta	1	Gabon	1
		Malta	1			Malta	2
Total	26		27		26		27
Bulk Carrier							
Russia	5	Russia	4	Russia	3	Russia	9
Panama	1	Marshall Islands	5	Liberia	5	Panama	4
Marshall Isls.	4	Liberia	8	Barbados	1	Marshall Isls.	2
Liberia	2	Portugal	1			Liberia	2
Portugal	3	Barbados	3			Barbados	1
Barbados	3						
Total	18		21		9		18
Container							
Russia	9	Russia	11	Russia	12	Russia	14
		Denmark	1			Portugal	1
						Hong-Kong	1
						China	1
Total	9		12		12		17

Note. Data from *NSR General Administration* (The NSR General Administration, 2024)

Cargo Ships

General cargo ships decreased in the 2022-2023 period, remaining only vessels that operated under the Russian flag and foreign flags such as Liberia, Tanzania, and Cameroon that still have Russian

names; oil tanker numbers decreased in 2022 and in 2023 exceeded the numbers of the first two years, including many vessels under foreign flags with Russian names; LNG tankers remained constant over each period of time; bulk carriers number decreased in 2022, then in 2023 doubled with vessels under the Russian flag and flags outside of Europe; container ships remained the same in 2022, then in 2023 increased (The NSR General Administration, 2024).

Table 4. Support vessels identified on the NSR between 2020-2023

Icebreaker							
2020		2021		2022		2023	
Russia	23	Russia	21	Russia	22	Russia	24
Tug							
Russia	27	Russia	52	Russia	41	Russia	48
Netherlands	6	Netherlands	5	Cyprus	1		
Cyprus	2	Cyprus	2	Kazakhstan	1		
		Norway	1				
		Belgium	1				
Total	35		61		43		48
Rescue							
Russia	7	Russia	5	Russia	4	Russia	5
Panama	1	Panama	1			Liberia	1
Liberia	1						
Total	9		6		4		6
Offshore Supply							
Russia	9	Russia	15	Russia	13	Russia	25
Norway	7	Norway	3				
Marshall Islands	1	Netherlands	1				
Cyprus	1	Panama	1				
Bahamas	2						
Australia	1						
Total	21		20		13		25
Supply							
Russia	7	Russia	4	Russia	4	Russia	3
Denmark	2						
Norway	2						
Total	9		4		4		3

Note. Data from *NSR General Administration* (The NSR General Administration, 2024)

Support Vessels

Icebreakers number remained constant for all years, operating only under the Russian flag; tugs recorded a large decrease in 2022 and remained low for 2023, operating only under the Russian flag; rescue ships had small variations from one year to another, the difference being that in the last two years only vessels under Russian flag operated; offshore supply vessels recorded a strong decrease in 2022 due to the withdrawal of ships under foreign flags such as Norway, being replaced in 2023 by vessels under the Russian flag; supply ships number decreased in 2022 due to the

withdrawal of foreign flags such as Denmark and Norway, gap that was not covered by Russian ships the next year (The NSR General Administration, 2024).

Specialized Vessels

Drilling ships recorded a decrease in 2022, with only vessels operating under the Russian flag; research ships decreased in 2022, recording an increase of their numbers in 2023 with vessels only under the Russian flag; dredging ships decreased in 2022 as a result of the withdrawal of vessels under foreign flag such as Belgium, the Netherland, and Luxembourg, recording only vessels under the Russian flag, then in 2023 along with Russian vessels, included Chinese flags; heavy load carriers recorded a strong decrease from previous year of 9 ships to only one as a result of withdrawal of foreign vessels, then in 2023 an increase to five vessels under flags such as Singapore, Panama and China, also this type of vessel was not recorded under the Russian flag in any of studied years; buoy-laying vessels were recorded once in 2020 and once in 2021; a diving support vessel was recorded only in 2021; a cable layer vessel was identified under the Russian flag in 2022 and 2023; a crane vessel was identified under Russian flag in 2023 (The NSR General Administration, 2024).

Based on this analysis of the 2020-2023 NSR traffic, a series of details can be determined about how it was affected by the War in Ukraine and sanctions against Russia that followed.

In the total number of records, an upward trend was identified form one year to another, including the period after the outbreak of the conflict. In contrast, in terms of the unique number of ships identified at the level of NSR, after the start of the war, in 2022 a decrease of 101 vessels, or 22.69% from one year to another, was recorded, followed by an increase in the next year, but not to pre-conflict values (The NSR General Administration, 2024).

An important feature of the NSR traffic is that a large part of it is composed of vessels under Russian flag, as evidenced by the ratio of the average number of Russian vessels over the four years, 302 ships, to the total average over the same period of time, 391. Ships under the Russian flag are 77.23% of the total. Comparing the average of the same indicators between first two years and last two years, the figures for first period are a total of 416.5 ships of which 293.5 are Russian ships or 70.46% of the total and for the second period the total are 365.5 ships of which 310.5 are Russian ships or 84.95% of the total. The total average of ships that operated on NSR decreased by 12.24%, but the average of Russian vessels increased by 5.79%. Interpreting these details, the war in Ukraine and sanctions that followed against Russian aggression affected NSR traffic, reducing the total number of vessels that operated in the region, a gap that was attempted to be replaced with vessels under the Russian flag (The NSR General Administration, 2024).

An explanation for these dynamics may be that despite the reduction in the total number of ships that operated on NSR after the outbreak of Russian aggression, the number of movement recordings along the passage increased in the following years. The proof is the comparison of the records from 2021, 10 081 (which recorded the largest number of vessels, 445), with 2023, 14 409 (only 387 vessels), a detail that represents an increase of 42.93% increase in number of records. These figures reveal the intensification of maritime activity in the region, which was covered by vessels under the Russian flag, recording a higher number of voyages over the same time frame (The NSR General Administration, 2024).

This process is due to the shrinking to almost half of the number of foreign flags under which ships operated in the region, from 24 foreign flags in 2020, to 22 in 2021, to 12 in 2022, and to 13

in 2023. A big part of the missing vessels from 2022 and 2023 were vessels that operated under European flags such as the Netherlands, Portugal, Norway, Belgium, and Denmark, countries that condemned Russian aggression and took measures such as sanctions that included the retreat of vessels from Russian arctic waters and projects (The NSR General Administration, 2024).

During the four-year range of the research, 21 different types of ships operated on the NSR, which were divided into four major categories, of which the most numerous were oil tankers, LNG tankers, general cargo vessels, tugs and research vessels (The NSR General Administration, 2024). This detail reveals that the passage has an important role for the region and the Russian economy because three of the top five most numerous types of vessels have a commercial role. Of the three types of vessels, after the outbreak of the conflict the number of general cargo vessels decreased, LNG tankers remained the same and oil tankers increased. Also, in the category of commercial ships were identified bulk carriers, whose number decreased after the start of the war, and container ships whose number increased.

In order to understand the dynamics of NSR traffic after the outbreak of the War in Ukraine, based on the above analysis, for each type of vessels identified it will be specified how its numbers were affected.

Total number of cargo ships decreased after the outbreak of the war, and for specific type of vessels in the following way: general cargo vessels decreased (including ships under the Russian flag), oil tankers increased (using ships with Russian names under foreign flags such as Gabon, Liberia, and Panama), LNG tankers remained constant (using foreign-flagged vessels such as Hong-Kong, Bahamas, Cyprus), bulk carriers decreased (gap covered by Russian flag ships), container ships increased (using Russian and foreign-flagged vessels like China and Hong-Kong). Interpreting these details, the number of cargo vessels decreased after 2022 and was largely covered by Russian-flagged ships or ships with Russian name under foreign flags (The NSR General Administration, 2024).

Support ships changed in number after the start of the conflict in the following way: icebreakers remained constant (only under Russian flag), tugs decreased (using in 2023 only under Russian flag), rescue vessels increased (only under Russian flag), offshore supply vessels increased (only under Russian flag). Based on these details, the support services where additionally covered with foreign vessels before 2022, then were completely covered with ships under the Russian flag (The NSR General Administration, 2024).

Specialized vessels changed in number after 2022 in the following way: drilling vessels decreased (only under Russian flag), research vessels increased (only under Russian flag), dredging ships decreased (only under Russian flag), heavy-load carriers decreased (replaced European flags with China, Singapore, Panama flags), buoy-laying ship, cable layer ship, and crane ship were used only under the Russian flag. The numbers of specialized vessels were strongly affected by conflict, being covered only in some parts by Russian flagged vessels, exception being heavy-load carriers from Europe which were replaced with vessels from Asia such as China and Singapore (The NSR General Administration, 2024).

Using information identified above, the NSR represents a vital passage for development of Russia's arctic territories and economy, traffic being impacted by sanctions and measures directed against Russian state, but this did not interrupt its flow. These details reveal that Russia managed to adapt

to the new conditions created by its actions against Ukraine in 2022, replacing gaps from its arctic transport infrastructure with its own alternatives or partner countries such as China.

Dynamics that followed the sanctions in Russia's Arctic economic projects

Along with NSR traffic dynamics identified above, a series of implications occurred in Russia's arctic territories. As part of international actions against Russia's aggression against Ukraine, the United States of America targeted energy projects, shipbuilding and gas trading, which are key elements of Russian arctic economy, given that its target for 2030 is 100 million tons of liquefied natural gas. The main targets of sanctions were: Russian energy projects in the Arctic such as Yamal LNG (completed), Arctic LNG 2, Vostok Oil (under development) and Murmansk LNG, Obsky LNG, Arctic LNG 1, and Arctic LNG 3 (planned); Russian energy companies such as Gazprom, Rosneft, Novatek, and Sovcomflot; foreign vessels involved in transport of natural resources and process of procurement of Arc7 ships from South Korea, or process of building such types of vessels sanctioning shipyards like Belokamenka and Zvezda (Aliyev, 2024). As part of the actions against conflict, European Union reduced its energy dependence on Russian natural resources through price caps and limits on oil and gas imports (Cooper, 2022), and in the end through replacement imports from other sources (The European Commission, 2026).

There are some examples for each of the targets. First, Western companies withdrew from partnerships with Russian ones like: Equinor (Norway) and British Petroleum (UK) from Rosneft; Trafigura (Switzerland) from Rosneft's Vostok Oil project; ExxonMobil (US) from Rosneft's Sakhalin-1 project; Shell (Netherlands) from Gazprom; and Technip (France and US) from Novatek's Arctic LNG 2 project (Lasserre & Baudu, 2023).

Second, technological implications emerged, such as the Arctic LNG 2 project facing challenges due to the fact that it was originally designed with western know-how and tech like American Baker-Huges turbines, Linde heat exchangers, Siemens's compressors. The same project faced delays because of sanctions on Chinese builders of liquefaction trains, and the European operators of heavy-load carriers retired their ships contracted for transport of liquefaction trains from Belokamenka to Gulf of Ob. The Murmansk LNG project which is also affected by the same sanctions that targeted necessary technology for its development and Belokamenka Shipyard. Arctic LNG 1 and 3 face difficulties due to the limited resource base they operate, considering that it should provide 20 million tons of liquefied gas per year and were not sufficiently explored, while also procurement of Arc7 LNG carriers was suspended because of the sanctions. Vostok Oil, which should produce 115 million tons of oil by 2030, is experiencing potential disruptions due to the challenges of procurement of Arc7 oil tankers, given that Zvezda Shipyard has built only one vessel, being the ship known as *Valentin Pikul* out of the 30 required for the operation of the project (Humpert, 2024).

The construction of ice-strengthened ships faces technological difficulties due to the sanctions that restricted access to western components such as generators and engines for oil tankers (Finnish Wartsila and German Man), propulsion systems (Sweden Azipod and Switzerland ABB), the membrane isolation system for tanks on LNG vessels (France GTT) and many other systems (Lasserre & Baudu, 2023).

Third, the procurement of new ships was affected through sanctions on Russian banks Sberbank and VTB Bank, which could not make the payments for the delivery of ice strengthened vessels,

leading to the cancellation of the contract by Daewoo Shipbuilding & Marine Engineering (Kommersant, 2022). Another problem with the shipping sector was the insurance of the merchant fleet under the Russian flag (Lasserre & Baudu, 2023).

Along with the identified sector, sanctions targeted natural resources trading with Russia. The EU reduced its import of Russian gas from 155 bcm in 2021 (45% of overall imports) to 35 bcm in 2025 (12% of overall imports) (The European Commission, 2022), Russian oil from 27% in 2022 to 2% in 2026 and banned import of Russian coal. (The European Commission, 2026) The identified volumes of resources were replaced with imports from other sources, and the EU capped gas imports at 180 euros per MWh (Council of the European Union, 2022) and a barrel of oil at 5% below average market prices for Russian oil (Council of the European Union, 2022), and in the end this was set at a capped price of $60 per barrel of oil (Kijewski & Cooper, 2022).

Russia's response to sanctions

Beyond identified problems generated by the international sanctions, Russia did not abandon its Arctic energy projects and sought solutions to continue their development. It continued the investment with the help of economic partners like China (Rao & Gruenig, 2024), or through direct involvement of its government (Haaja & Mäkinen, 2026). In the shipbuilding sector, actions were taken to replace French, Finnish and German special equipment manufacturers, Japanese and Korean shipbuilders with Russian shipbuilders and Chinese equipment (Humpert, 2024; Lasserre & Baudu, 2023). In order to avoid Western regulatory oversight, the Russian merchant fleet was transferred from Lloyd's Register to Indian Register of Shipping, and after Western sanctions hit, moved from European insurers to UAE and Indian insurers. Trade of oil and gas with Europe was redirected to China and India developing a new logistic network designed to avoid international embargo through the Arctic directly to Asia or through "grey tankers", also known as Shadow Fleet. This fleet is composed of an additional fleet of oil tankers that are old vessels poorly insured, often falsify their identity, hide or change their AIS position and transship the cargo onto other ships to avoid sanctions. To understand how vast this fleet is, it represents 10% of the international oil-tanker fleet (Lasserre & Baudu, 2023).

Despite difficulties, Russia continues the development of its Arctic projects, claiming that the demand for energy resources in the future will be even greater, and trying to consolidate its position on the global energy market (Humpert. 2024).

Conclusions

Based on above analysis, conflict in Ukraine changed the dynamics of NSR traffic, but did not close its operation. Russia managed to adapt to new conditions created by sanctions and measures that followed them using its own means and finding new partners. Through this approach, Russia tried to close the gap left by European vessels that operated in region, by using additional Russian vessels and special ships from Asia. Despite the fact that these actions worked, they failed to attain the number of ships seen before the conflict, as evidenced by the numbers identified in this research, revealing that Western sanctions were effective and that Russia's activity in the Arctic was affected.

In the same way, Russia has adapted to the new conditions created by sanctions regarding the development of energy projects, shipbuilding and trade of energy resources. Despite its ability to adapt to the new reality, all three targets have been affected by sanctions through limitations and

delays that caused huge economic losses for Russia. Nevertheless, because of the scale of the projects, globalization and their prioritization by the state, the sanctions were unable to halt Russia's Arctic projects, but they are the reason why these projects do not keep pace with initial plans of development, and all of them face uncertainty.

Based on data and information identified by this research, through Arctic energy projects and the NSR, Russia consolidated its power in the 21st century, which is why, despite being targeted by Western sanctions, it continues to pursue further development of the region.

References

Aliyev, N., (2024). *Moscow's Arctic Projects Amidst the War: Sanctions, LNG projects, Icebreakers and the Northern Sea Route*. Italian Institute for International Political Studies. https://www.ispionline.it/en/publication/moscows-arctic-projects-amidst-the-war-sanctions-lng-projects-icebreakers-and-the-northern-sea-route-178452

Allison, R., (2017). Russia and the post-2014 international legal order: revisionism and realpolitik. *International Affairs, 93*, 519-521, 528-531, 535-536. https://doi.org/10.1093/ia/iix061

Cooper, C. (2022). The West's oil war with Russia gets real. *Politico*. https://www.politico.eu/article/west-oil-war-russia-sanctions-oil-price-cap-g7-vladimir-putin-zelensky-opec-war-ukraine/

Council of the European Union, (2022). *Council Regulation (EU) 2022/2578 of 22 December 2022 establishing a market correction mechanism to protect Union citizens and the economy against excessively high prices*. https://eur-lex.europa.eu/eli/reg/2022/2578/oj/eng

Council of the European Union, (2022). *Council Regulation (EU) 2022/2367 of 3 December 2022 amending Regulation (EU) No 833/2014 concerning restrictive measures in view of Russia's actions destabilizing the situation in Ukraine*. https://eur-lex.europa.eu/eli/reg/2022/2367/oj/eng

Federal State Budgetary Institution – The Information Analytical and Statistical Center of the Rosmorrechflot. (2012) *The Federal Law of July 28, 2012, N 132-FZ "On Amendments to Certain Legislative Acts of the Russian Federation Concerning State Regulation of Merchant Shipping on the Water Area of the Northern Sea Route"* (Article 5.1) http://www.nsra.ru/en/ofitsialnaya_informatsiya/zakon_o_smp.html

Gaddy, C., G., & Ickes, B. W., (2013). Russia's Dependence on Resources. In Alexeev, M., Weber, S. (Eds.) *The Oxford Handbook of Russian Economy* (Cap. 13, pp. 5-10). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199759927.013.0023

Haaja, E., Mäkinen, H. (2026). The Geopolitical Implications of Russia's Arctic Natural Resource Development Since the War in Ukraine. In: Liuhto, K., Sipilä, J. (Eds) *Inevitable Instability in Russia*. (pp. 327-328) Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-032-11892-9_15

Humpert, M., (2024). From Ukraine to the Arctic: The War's Impact on Russia's Northern Energy Ambitions. *High North News*. https://en.highnorthnews.com/home/from-ukraine-to-the-arctic-the-wars-impact-on-russias-northern-energy-ambitions/155890

Kijewski, L, & Cooper, C., (2022). EU agrees $60 price cap on Russian oil. *Politico*. https://www.politico.eu/article/eu-agrees-russian-oil-price-cap-after-poland-backs-plan/

Komin, M., & Hosa, J., (2025). *The Bear Beneath the Ice: Russia's Ambitions in the Arctic*. European Council on Foreign Relations (pp. 2-4, 6). https://ecfr.eu/wp-content/uploads/2025/05/The-bear-beneath-the-ice-Russias-ambitions-in-the-Arctic.pdf

Kommersant, (2022). Танкеры расплылись (The tankers dispersed). https://www.kommersant.ru/doc/5367711

Laruelle, M., (2020). *Russia's Arctic Policy: A Power Strategy and Its Limits*. French Institute of International Relations (Report no. 117, p.6). https://www.ifri.org/sites/default/files/migrated_files/documents/atoms/files/laruelle_russia_arctic_policy_2020.pdf

Lasserre, F., & Baudu, H., (2023). *The consequences of the war in Ukraine in the Arctic*. Network for Strategic Analysis (pp. 2-10). https://ras-nsa.ca/wp-content/uploads/2023/04/Report-on-the-consequences-of-the-war-in-Ukraine-in-the-Arctic.pdf

Petrov, O., V., (2010). Mineral Resource Potential of the Russian Federation: Condition and Innovation use Trends. *Economy of Region*, 2, 135-137. https://doi.org/10.17059/2010-2-12

Pisciotta, B., (2019). Russian revisionism in the Putin era: an overview of post-communist military interventions in Georgia, Ukraine, and Syria. *Italian Political Science Review*, 50 (1), 10-12. 16-18. https://doi.org/10.1017/ipo.2019.18

Rao, I., Gruenig, M., (2024) *Sanction-Proof? Russia's Arctic Ambitions and the China Factor*. The Arctic Institute. https://www.thearcticinstitute.org/sanction-proof-russias-arctic-ambitions-china-factor/

Solski, J., J., (2020). The Northern Sea Route in the 2010s: Development and Implementation of Relevant Law. *Arctic Review on Law and Politics*, 11, 386-390. https://www.jstor.org/stable/48710638

The European Commission, (2022). *In focus: Reducing the EU's dependence on imported fossil fuels*. https://commission.europa.eu/news-and-media/news/focus-reducing-eus-dependence-imported-fossil-fuels-2022-04-20_en?utm_source=copilot.com

The European Commission, (2026). *REPowerEU – phase out of Russian energy imports*. https://energy.ec.europa.eu/strategy/repowereu-phase-out-russian-energy-imports_en?utm_source=copilot.com#key-facts

The NSR General Administration. (2020). *Resolution about the approval of the rules of navigation in the water area of the Northern Sea Route*. https://nsr.rosatom.ru/upload/iblock/c8a/RulesOfNavi.pdf

The NSR General Administration. (2024). *Information about movements of the vessels which are nearby the water area an in the water area of The Northern Sea Route*. https://nsr.rosatom.ru/en/current-information/information-about-movements-of-the-vessels-which-are-nearby-the-water-area-and-in-the-water-area-of-/

The NSR General Administration. (2026). *Subject of activity and functions of NSR General Administration*. https://nsr.rosatom.ru/en/company/object-of-activity-and-functions-of-nsra/

The Russian Government. (2008). *ОСНОВЫ ГОСУДАРСТВЕННОЙ ПОЛИТИКИ РОССИЙСКОЙ ФЕДЕРАЦИИ В АРКТИКЕ НА ПЕРИОД ДО 2020 ГОДА И ДАЛЬНЕЙШУЮ ПЕРСПЕКТИВУ (Principles of the State Policy of the Russian Federation in the Arctic to 2020 and beyond)* (pp. 1-2). http://static.government.ru/media/files/A4qP6brLNJ175I40U0K46x4SsKRHGfUO.pdf

The Russian Government. (2013). *СТРАТЕГИЯ РАЗВИТИЯ АРКТИЧЕСКОЙ ЗОНЫ РОССИЙСКОЙ ФЕДЕРАЦИИ И ОБЕСПЕЧЕНИЯ НАЦИОНАЛЬНОЙ БЕЗОПАСНОСТИ НА ПЕРИОД ДО 2020 ГОДА (Strategy for development of the Arctic zone of the Russian Federation and ensuring national security for the period until 2020)* (pp. 8-10). http://static.government.ru/media/files/2RpSA3sctElhAGn4RN9dHrtzk0A3wZm8.pdf

The Russian Government. (2020). *ОСНОВЫ ГОСУДАРСТВЕННОЙ ПОЛИТИКИ РОССИЙСКОЙ ФЕДЕРАЦИИ В АРКТИКЕ НА ПЕРИОД ДО 2035 ГОДА (Principles of the State Policy of the Russian Federation in the Arctic to 2035)* (p. 2). http://static.kremlin.ru/media/events/files/ru/f8ZpjhpAaQ0WB1zjywN04OgKiI1mAvaM.pdf

Vakhrusheva, K., Blokova, E., Levchenko, V., Sergeev, Y., (2025). *The Northern Sea Route: Russia's industrial and political expansion, its environmental costs, and Arctic shipping risks* (pp. 63-68). Bellona Foundation. https://etc.bellona.org/publication/nsr-risks-eng/

Vakulenko, S., (2025). *Global Energy Competition in the Arctic: A Reassessment* (pp. 9-12). Carnegie Russia Eurasia Center, https://assets.carnegieendowment.org/static/files/Artic%20Energy%20Competition.pdf

Wani, K., (2023). Navigational Rights and the Coastal State's Jurisdiction in the Northern Sea Route. In Kraska, J., Long, R., Nordquist, M., H. (Eds.) *Peaceful Maritime Engagement in East Asia and the Pacific Region* (Cap. 17, pp. 266-267, 269-272). Brill. https://doi.org/10.1163/9789004518629_018

Yermakov, V., (2024). *Follow the Money: Understanding Russia's oil and gas revenues* (pp. 1, 3, 8). Oxford Institute for Energy Studies. https://www.oxfordenergy.org/wpcms/wp-content/uploads/2024/03/Follow-the-Money-Russian-Oil.pdf