
THE NORTHERN SEA ROUTE AS A KEY RUSSIAN TRANSPORT CORRIDOR: STRATEGIC IMPORTANCE AND DEVELOPMENT PROSPECTS



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INTRODUCTION

In the context of the globalization of transport flows, there is a need to develop efficient transport routes capable of ensuring the fast and cost-effective movement of goods between regions. Of particular importance in this process are transport corridors, which can significantly reduce the time and cost it takes to move goods. At the same time, Russia's national interests determine the development of transport corridors which would be less dependent on external players and the international political environment.

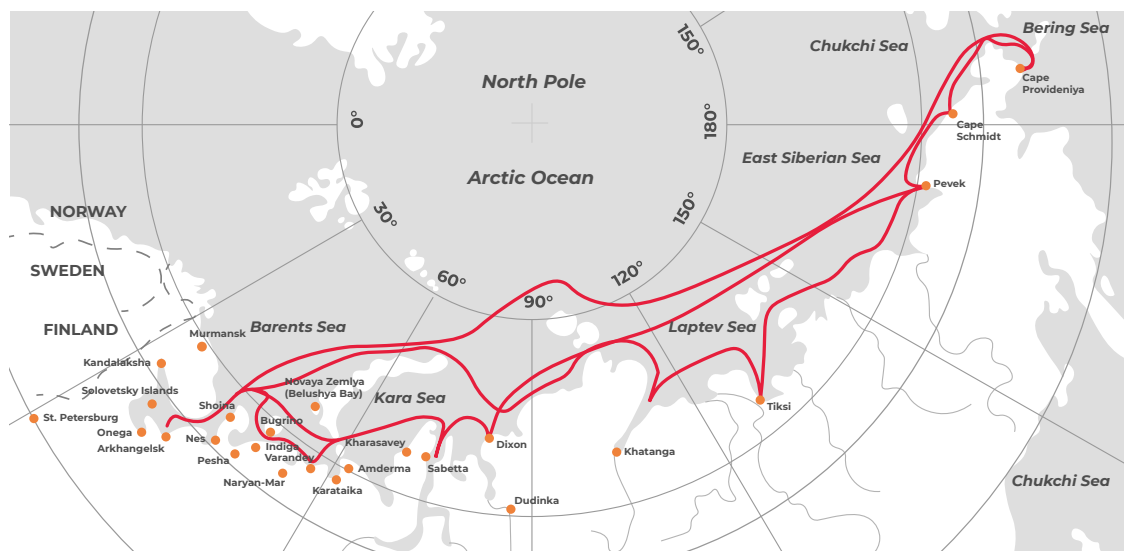
The Northern Sea Route (NSR), as one such corridor, is acquiring strategic importance for Russia, as it offers the shortest and most promising route between Europe and Asia. The importance of this route is also increasing in the context of climate change, which is opening up new opportunities for its operation and increased competitiveness.

The development of the NSR is intended to provide another link between Asia and Europe. For Russia, this promises new prospects for creating an alternative transport corridor which would strengthen the country's role in global trade and economic ties. Among other things, the development of the NSR provides an investment incentive, especially for the northern regions of the country, and ensures a synergistic effect in related industries.

HISTORY OF THE DEVELOPMENT AND ROLE OF THE NSR IN THE TRANSPORT SYSTEM OF RUSSIA

The Northern Sea Route (NSR) is the shortest sea route between Europe and East Asia, as well as between the European and Far Eastern parts of Russia. The Northern Sea Route is part of the Northern Transport Corridor, which runs from the port of Murmansk to Cape Dezhnev. The NSR passes through the seas of the Arctic Ocean (Barents, Kara, Laptev, East Siberian, Chukchi and Bering).

NORTHERN SEA ROUTE



Source: [Russian University of Transport](#)

The main ports of this transport corridor are Murmansk and Arkhangelsk, while along the NSR there are also such significant ports as Igarka, Dudinka, Dickson, Tiksi and Pevek. The length of the route is **more than 14 thousand kilometers**, and the primary advantage it provides to shippers is in the delivery time of goods - 18 days via the NSR instead of 37 via the Suez Canal (from the port of Murmansk to the ports of Japan). Also, there are no queues, reloading, tolls or piracy along this route, which increases its attractiveness in terms of reliability and safety. However, the NSR does not have a fixed navigation route. The journey ships take may vary depending on weather conditions and ice conditions. As a result, delivery times may also change. The infrastructure of the coastal regions is poorly developed; there are no railways in the far north-east; particularly to the ports of Pevek, Igarka¹ and Tiksi. The Arctic ports themselves require modernization.

¹ From 1947 to 1953, the railway section "Chum - Salekhard - Korotchaev - Igarka" was built. In 1964, the rails from the section "Yeniseiskaya - Igarka" were removed to meet the needs of Norilsk.

In the early 20th century, expeditions were organized to explore the Northern Sea Route, which laid the foundation for its further development. The commissioning of the nuclear icebreakers Lenin (1959) and Arktika (1975) made it possible to navigate the segment of the NSR located in the western sector of the Arctic year-round, which contributed to the development of industry on the Arctic coast.

During the Soviet period, the NSR served as an important transport route for supplying the industrial zones of the Soviet Union, including areas where minerals and rare earth metals were mined, such as the Norilsk Industrial Hub and the West Siberian Oil and Gas Complex, as well as other industrial facilities in northeastern Russia.

In the 1990s, the operation of the NSR underwent significant changes due to the economic and political instability which gripped the country. During this period, the volume of NSR transportation decreased sharply, primarily due to a reduction in government support. If in Soviet times the NSR was used to supply the northern territories of the country, including for the transportation of goods to the Arctic zone and for export, then in the 1990s its activities were limited mainly to local transportation, and international transits were irregular.

The Northern Sea Route was opened to international shipping in 1991, together with the publication of the "Rules for Navigation along the NSR Routes". They took into account the provisions of the UN Convention on the Law of the Sea of 1982, which regulates the use of sea areas covered by ice, and established a notification procedure for the access of foreign vessels to NSR routes.

At the peak of its operation in 1987, the volume of transportation via the NSR amounted to about 7 million metric tons. However, in the 1990s this figure significantly decreased, and in 2000 the volume of transportation did not exceed 1.6 million tons, both as the result of the crisis in the economy and a lack of funding for infrastructure. Compared with the Suez Canal, which was more advantageous in a number of respects, such as year-round accessibility, established logistics, and lower risks associated with harsh climatic conditions, the NSR could not compete in the international transportation market.

The situation saw no significant changes in the early 2000s. Although concepts and strategies for the development of the Northern Sea Route were developed at the state level, no specific projects to improve the infrastructure and attract investment were implemented. During this period, foreign companies showed an interest in the NSR as a potential route for transporting hydrocarbons, but no real steps were taken to develop the route.

A significant step in the development of the NSR was made in 2008, when the "Basic State Policy of the Russian Federation in the Arctic for the Period up to 2020 and Beyond" was adopted. The document [determined that](#) ensuring the use of the Northern Sea Route as a single transport corridor is a high-priority national interest, and its attractiveness for international shipping is a strategic priority of state policy.

The development of the Arctic and the unleashing of the NSR's potential is a national development priority due to a number of factors. First of all, the NSR provides direct access to international markets, which is especially important in the context of sanctions pressure and, as a result, the restructuring of classic logistics routes.

In addition, the NSR is not considered exclusively as a transit route. Its importance also lies in meeting domestic transport needs, including support for large projects to develop Arctic resources. The route plays a critical role in the logistics integration of the Arctic, connecting remote territories with the country's industrial and economic centers.

The development of the NSR, including the transition to year-round navigation, has stimulated the development of northern deliveries, ensuring that the hard-to-reach territories of the Far North get stable supplies. Every year, food, medicine, fuel and other socially significant goods are delivered via this route, which is critical for the life of many far-flung communities. Due to these prerequisites, in the 2010s, attention to the Northern Sea Route increased significantly, especially with regard to its potential for transit shipments. An important event was the passage of the bulk carrier "Nordic Barents" under a foreign flag in 2010, which transported iron ore concentrate from Norway to China without calling at Russian ports and without obtaining permission to cross the border. This event became the first precedent for the passage of a foreign vessel through the waters of the Russian Arctic in full transit. Despite the growing volumes of cargo transportation, the technical infrastructure of the NSR requires modernization.

Despite the growing volumes of cargo transportation, the technical infrastructure of the NSR required modernization. In 2013, the Decree of the President of the Russian Federation "[Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period up to 2020](#)," was adopted, which set tasks for the socio-economic development of the Arctic, the improvement of transport infrastructure and expansion of international cooperation. In 2014, the government approved the "Socio-economic Development of the Arctic Zone of the Russian Federation" programme, aimed at modernizing the NSR and developing coastal infrastructure.

In 2014, the volume of transit cargo transportation via the NSR decreased by 77%, amounting to 274 thousand tons compared to 1.18 million tons in 2013. The sharp drop in transit transportation via the NSR was caused by a number of factors, including: economic sanctions and growing competition with alternative routes (principally the completion of the construction of the second channel of the Suez Canal in 2015). [The reduction of tariffs](#) on the Suez Canal for large vessels, coupled with the elimination of piracy threats off the Horn of Africa, made this route even more preferable for transit shipments.

Changes in the economic environment also had a significant impact. The drop in oil prices below \$100 per barrel, taking into account the increased fuel consumption in ice conditions, significantly reduced the economic attractiveness of transportation via the NSR. In addition, [the narrowing gap](#) in hydrocarbon prices between the European and Asian markets reduced the profitability of transit via the NSR. Despite this, domestic transportation has continued to grow, mainly due to the activities of Russian oil and gas companies such as Gazprom, Rosneft and NOVATEK, which were actively developing infrastructure and building an icebreaker fleet.

During the 2010s, the NSR received the formal status of a strategically important transport link for Russia. With the development of Arctic infrastructure, the NSR has come to play a key role not only in providing for the Arctic regions, but also within the national economy, especially in the context of the reorientation of Russia's foreign trade to the countries of the Asia-Pacific region.

COMPARATIVE ANALYSIS OF SHIPPING ROUTES OF THE NSR AND THE SUEZ CANAL ASIA – EUROPE

Parameter	Northern Sea Route	Suez Canal
Length	<ul style="list-style-type: none"> Far East – Northern Europe – about 12,000 km 	<ul style="list-style-type: none"> 21,455 km
Fuel consumption per voyage excluding icebreaker support (July/September)	<ul style="list-style-type: none"> <u>237 600 \$/ 250 500 \$</u> 	<ul style="list-style-type: none"> <u>354 100 \$/ 340 800 \$</u>
Duration of passage	<ul style="list-style-type: none"> 18 days 	<ul style="list-style-type: none"> 332 days
Cost of using it once (July/September)	<ul style="list-style-type: none"> <u>602 100 \$/ 488 900 \$</u> 	<ul style="list-style-type: none"> <u>745 200 \$/732 900 \$</u>
Climate conditions	<ul style="list-style-type: none"> Need for icebreaker support in winter The navigation season, when ships do not require icebreaker support, lasts about 4 months (from July until October) 	<ul style="list-style-type: none"> Year-round access
Navigational features	<ul style="list-style-type: none"> The route varies depending on ice conditions No fixed route 	<ul style="list-style-type: none"> Fixed route
Capacity restrictions	<ul style="list-style-type: none"> Low workload Limited port capability: <u>total capacity</u> of seaports along the NSR in 2024: 47.5 mln metric tons The use of large container ships is limited by the depth of existing routes along the NSR. The guaranteed depth is <u>12 meters</u> (the average draft of a container ship is 15 meters), but in drifting ice there is the risk of a ship deviating from this indicator Irregularity and seasonality of ship traffic along the NSR 	<ul style="list-style-type: none"> High congestion; risk of ship delays Capacity is limited by ship sizes (Suezmax). The depth of the Suez Canal allows ships with a draft of no more than 20.1 meters to pass through

Infrastructure	<ul style="list-style-type: none"> • Infrastructure of coastal regions is poorly developed, there are no railways in the north-eastern direction, in particular, to the ports of Pevek, Igarka, Tiksi • Arctic ports require modernization • Lack of an effective meteorological observation system • Lack of search and rescue resources 	Developed infrastructure
Safety	<ul style="list-style-type: none"> • No piracy • Risk of emergency situations due to unpredictable ice conditions 	<ul style="list-style-type: none"> • Piracy risk in the Gulf of Aden and off the coast of Somalia
Administrative barriers	<ul style="list-style-type: none"> • To pass through the NSR, it is necessary to submit an application from 4 months to 15 days before the start of the passage of vessels 	<ul style="list-style-type: none"> • To pass through the Suez Canal, an application must be submitted <u>48 hours</u> prior to the start of the passage of vessels

Source: authors' calculations based on open sources.

The main prospect for the NSR is considered to be its ability to become an alternative to the Suez Canal.

The route connecting the Far East with Northern Europe via the NSR is approximately 12 thousand kilometers long, which is significantly shorter than the Suez Canal route, which extends about 21,000 kilometers. This allows ships passing through the NSR to significantly reduce travel time and, accordingly, fuel costs. For example, a voyage along the NSR in September costs about \$250,500, while passage through the Suez Canal requires about \$340,800 for the same period.

Duties on the NSR and the Suez Canal play an important role in the transportation economy. Unlike the Suez Canal, where duties are mandatory for all ships using the route, the fee for passage along the NSR depends on ice conditions and the need for an icebreaker escort.

It is worth noting that the route's advantages are realized only during the summer-autumn navigation period. In the winter, the NSR requires a mandatory icebreaker escort for most vessels, which increases the cost of the route. Even with icebreakers to help escort vessels, ice conditions in winter can create delays and increase risks for vessels and their crews. Another important limitation of the NSR is throughput: the NSR is limited by the capacity of ports, the total capacity of them in 2024 was 47.5 million tons. In addition, the geological features of the route impose restrictions on the use of large container ships. However, with the development of infrastructure and the icebreaker fleet, as well as taking into account the potential for an increase in the summer-autumn navigation period, the NSR has the potential to become a seasonal alternative to the the Suez Canal route.

STATE STRATEGY AND INFRASTRUCTURE

The current development of the NSR is aimed at implementing the long-term [Northern Sea Route Development Plan through 2035](#), approved on August 1, 2022. The document outlines key areas and goals, including increasing export and transit cargo flows, developing port infrastructure, expanding icebreaker and cargo fleets, creating an Arctic satellite constellation, and providing digital services in the NSR waters.

The project includes more than 150 activities, including the construction of Utrenny LNG and gas condensate terminals, the Sever Bay oil terminal, the Yenisei coal terminal, and coastal facilities to supply the Baimskoye field. The plans also include the creation of LNG handling complexes in Kamchatka Territory and Murmansk Region as well as a port hub in Vladivostok.

According to the work of Y. V. Elizarov, an expert at the Analytical Center for the Government of the Russian Federation, the development of the NSR can be divided into four key stages, taking into account changes in cargo flows and the organization of shipping.

The first stage, from 2018 to 2024, included the implementation of the federal Northern Sea Route project. During this period, special attention was paid to the accelerated development of the extraction, processing and transportation of natural resources from the ports of the Kara Sea (Sabetta, Dudinka, Dikson) in the direction of the western border of the NSR with year-round navigation. The key tasks were to strengthen the icebreaker fleet and modernize the port infrastructure - ensuring year-round shipping along the western part of the route. The second stage, from 2025 to 2030, will be aimed at organizing year-round shipping along the entire length of the NSR. This will ensure stable development of the extraction, processing and transportation of raw materials from all ports in the region, as well as the development of cabotage, import and transit transportation. An important element will be the introduction of Just in Time service in the Kara Sea and in the summer-autumn period along the entire length of the NSR.

The third stage, from 2031 to 2035, will focus on the creation of a new national and international latitudinal transport corridor, which will ensure year-round shipping with guaranteed transit times and the availability of the necessary logistics services. During this period, the implementation of the state policy on the development of international transit via the NSR will continue.

The fourth stage, starting in 2036, is expected to bring about a competitive multimodal transport and logistics corridor that will ensure the transportation of goods along the entire length of the NSR.

The development of the NSR is being carried out [under the management of key public and private institutions](#). Pursuant to a law signed by the Russian President at the end of 2018, the state corporation Rosatom has been named as the NSR's infrastructure operator, which allows it to coordinate the development of infrastructure, manage the icebreaker fleet and ensure the safety of maritime traffic on the Northern Sea Route. In turn, the government of the Russian Federation has approved the navigation rules and the development of NSR

infrastructure facilities, while the Ministry of Transport ensures the regulatory framework for the shipping and the safety of maritime traffic.

The "Plan" provides for measures to develop container logistics aimed at expanding transit and cabotage transportation. In this context, the main tasks are to create infrastructure for container transportation, develop shipping capacity and improve transport logistics.

It is envisaged to create a container fleet for transit and cabotage transportation. It is also planned to create a Russian container operator and a fleet of nine container ships by 2027.

In 2024-2025, the "Plan" envisages the creation of the Western and Eastern transport and logistics hubs for the transshipment of container cargo. The construction of railway approaches to these hubs in the northwestern part of Russia is planned to increase the efficiency of connections between sea and land transport. By 2026, there are plans to complete the construction of a sea terminal for the shipment of lead-zinc concentrate from the Novaya Zemlya archipelago. As part of the implementation of the project to create the Eastern transport and logistics hub of the NSR, there are plans to invest 18 billion rubles of extra-budgetary funds in the period from 2024 to 2026 in the infrastructure of the Vladivostok Sea Port (VMTP, part of the FESCO transport group). The annual throughput capacity of the port is 13.4 million tons of cargo. There were plans to increase the the container turnover volume to 850 thousand TEU by 2024, and in 2025-2026 this figure is expected to exceed 1 million TEU.

In terms of target indicators of cargo turnover volumes, the "Plan" assumes the following stages of implementation: in the period from 2019 to 2024, the main goal was to achieve cargo turnover volumes at a level of 80 million tons along the Northern Sea Route and begin transportation in the eastern direction of the route. As of November 2024, the volume of cargo transportation along the NSR amounted to about 33.1 million tons, with a projected figure by the end of the year of 37.6 million tons; thus, the expected transportation volumes for 2024 deviated from the target.

In September 2024, Rosatom presented [two alternative scenarios](#) for the development of the NSR, taking into account the current foreign policy conditions. The baseline scenario assumes that a cargo flow of 117 million tons is achieved by 2031 and 150 million tons is reached by 2035. According to the best-case scenario, cargo flow will total 150 million tons by 2031 and 192 million tons by 2035. The initial plan assumed a target of 224.96 million tons by 2031.

By 2030, year-round shipping is planned along the entire length of the NSR. The final stage, which should be complete by 2035, involves increasing cargo turnover to 130-170 million tons.

The NSR is also included in the national "Efficient Transport System" project, which has a total budget of 10 trillion rubles, the launch of which was announced in August 2024. The federal government has allocated 175.45 billion rubles for the "Development of the Great Northern Sea Route" in 2025-2027. A significant part of these funds will be used to modernize and develop seaports along the route. In particular, there are plans to allocate more than 19 billion rubles for these purposes in 2026-2027.

Among the key activities are the construction of 14 rescue vessels, four nuclear icebreakers, four organic-fueled icebreakers and a multifunctional nuclear

maintenance vessel. In addition, a digital transport and logistics platform will be introduced to improve coordination between different modes of transport.

According to Vladimir Panov, Rosatom's special representative for Arctic development, an important element of the NSR development project is the approval of its official route. The need for this initiative is due to the fact that the legal status of the NSR (3,000 nautical miles from Novaya Zemlya to the Bering Strait) does not correspond to the actual boundaries of the route.

According to statements made by Igor Levitin, the Russian president's special representative for international cooperation in transport, at the St. Petersburg International Economic Forum in 2024, additional railway connections are necessary for efficient transportation along the NSR. Today, there are rail terminals in Murmansk, Arkhangelsk and Vladivostok, but to increase the capacity and competitiveness of the Arctic route, Russia needs at least one or two more railway hubs in Siberia or the Urals. This was also noted at the [SPIEF-2024 session 'The Northern Sea Route: Expanding Arctic Horizons'](#).

Y. V. Elizaryev of the Analytical Center for the Government of the Russian Federation believes that in order to ensure the competitiveness of the NSR, it is also necessary to establish a number of critical parameters: it is important that the total cost of delivery of 1 TEU from the port of Shanghai to Northern Europe does not exceed \$1,070, and the delivery time is no more than 32-33 days. For Mediterranean ports, the cost of delivery should be no more than \$1,080, and the delivery time no more than 27-28 days. To ensure a tangible competitive advantage, the NSR should be 10% cheaper and 20% faster than alternative routes.

Thus, the economic model for the development of the NSR is based on an integrated approach to the development of infrastructure, fleet modernization and the creation of effective logistics solutions to increase cargo flow and ensure the competitiveness of the route.

In order to implement these tasks, a number of state projects and the use of both budgetary and extra-budgetary funds are being considered. The key players in the development of the NSR are companies involved in oil and gas projects. These companies are actively developing the transportation of hydrocarbons along the NSR, which accounts for a significant proportion of the route's cargo flow.

Oil and gas projects of the Northern Sea

The main factor determining the flow of cargo via the Northern Sea Route is the transportation of hydrocarbons - liquefied natural gas (LNG), oil and gas condensate. This flow is mainly provided by two large projects: NOVATEK's Yamal LNG and Gazprom Neft's Novoportovskoye field development. These key projects provide the majority of shipments on the route, generating about 80% of the cargo flow in 2023.

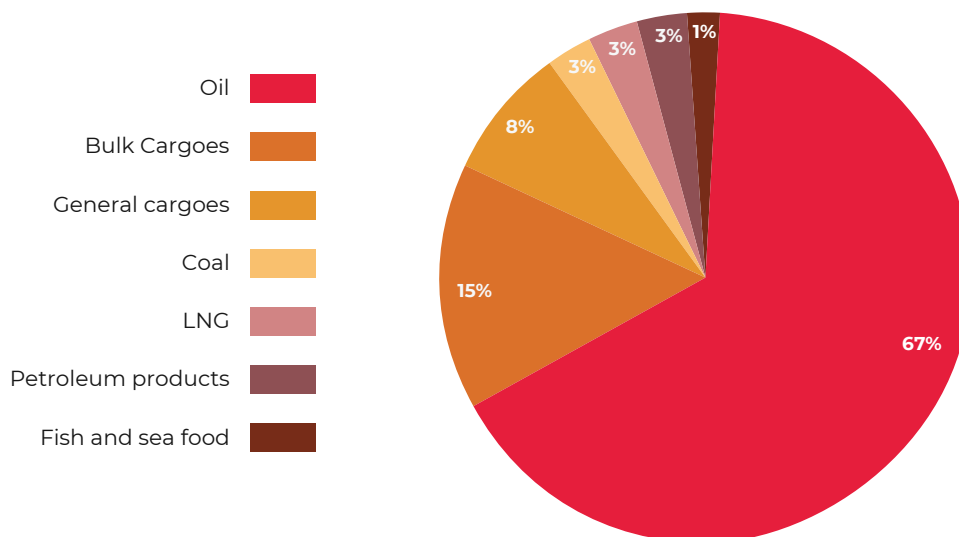
THE ROLES OF KEY COMPANIES IN THE NORTHERN SEA ROUTE

Company	Major Projects
Rosatom	<ul style="list-style-type: none"> Construction of icebreakers to ensure navigation along the NSR. Since 2018 — infrastructure operator of the NSR. Construction of the container terminal "Western Transport and Logistics Hub" (WTLH) in Murmansk Region. Development of a digital platform in the Arctic. Launch of year-round navigation eastward along the NSR jointly with NOVATEK
Severnaya Zvezda (The	<ul style="list-style-type: none"> Implementation of the project for the development of the Syradasay coal deposit on the Taimyr Peninsula. Construction of the Yenisei terminal with a capacity of up to 15 million tons
NOVATEK	<ul style="list-style-type: none"> Implementation of the Yamal LNG and Arctic LNG-2 projects Owner of 28 vessels for transporting LNG. It is planned to build another 30 vessels for work on the NSR
Rosneft	<ul style="list-style-type: none"> Implementation of the Vostok Oil project: development of the Ichemminkoye and Baikalovskoye fields, construction of the Vankor-Payakha-Bukhta Sever oil pipeline and the Port Bukhta Sever oil terminal, as well as the infrastructure of the Yenisei basin.
Norilsk Nickel	<ul style="list-style-type: none"> Norilsk Nickel actively uses the Northern Sea Route to transport products and cargo necessary for the operation of the Norilsk division and the implementation of major projects (Sulfur Program, Clean Norilsk and Southern Cluster).
Gazprom Neft	<ul style="list-style-type: none"> Implementation of the Novy Port project (development of the Novoportovskoye oil and gas condensate field, carried out by the subsidiary Gazpromneft-Yamal). Participation in the development of the Arctic and the use of the NSR for oil transportation. Supply of environmentally friendly fuels for the Arctic fleet and development of bunkering infrastructure.

Source: authors' calculations based on open sources.

Exports of Russian hydrocarbons traveling eastward along the Northern Sea Route during the 2023 navigation season amounted to approximately 3.84 million tons.

STRUCTURE OF TRANSIT CARGO FLOW ALONG THE NSR WATER IN 2023



Source: Gekkon Consulting Centre

Gas production projects

The Yamal LNG project is aimed at developing and exploiting a significant part of the South Tambey gas condensate field, with the aim of producing liquefied natural gas (LNG) and stable gas condensate for their year-round export to world markets. Particular attention is paid to supplies to the Asia-Pacific countries via the Northern Sea Route. The project terminal includes an offloading technological trestle with two berths for LNG and an offloading berth for oil loading, located in the port of Sabetta. Navigation along the Northern Sea Route is provided year-round.

In 2023, Yamal LNG produced about **19.88 million** tons of liquefied natural gas (compared to 21 million tons in 2022), a significant part of which, more than 70%, was supplied to European markets. In 2024, production volumes increased to **25.3 million tons over nine months, which is 7.1%** higher than during the same period last year. In addition to LNG, the project produces up to 1.5 million tons of gas condensate per year, which is exported by smaller tankers (20-50 thousand deadweight tons), which forms a stable cargo base of about 20 million tons annually.

LNG supplies via the NSR reflect a change in the global balance of gas supplies, with Europe returning to the role of the largest importer. Despite the stability in LNG supply volumes to Asia, NOVATEK is also focused on the European market, where gas prices are traditionally higher.

The Arctic LNG-2 project at the Utrenneye field, located on the Gydan Peninsula, represents the next stage in the development of the Arctic and increasing the capacity of the NSR. This is the second major LNG project of NOVATEK, which is designed to build three production lines with a total capacity of 19.8 million tons of LNG per year, each of which will produce up to 6.6 million tons. The first line was launched at the end of 2023, and the second and third are planned for launch in 2024 and 2026, respectively.

Arctic LNG-2 will also provide additional production of up to **1.6 million tons of gas condensate**, which will create an additional cargo base for the NSR and support regular shipments.

For the transportation of LNG and condensate, the project will use a fleet of Arc7 class icebreaking tankers, specially designed for operation in Arctic conditions. To improve the efficiency of tanker turnover and reduce delivery times, NOVATEK is creating two transshipment systems with a capacity of over **20 million tons** per year each: one in Murmansk Region for European destinations and the second in Kamchatka for the Asian market. This will allow for the prompt transshipment of LNG to smaller-class vessels and the optimization of logistics.

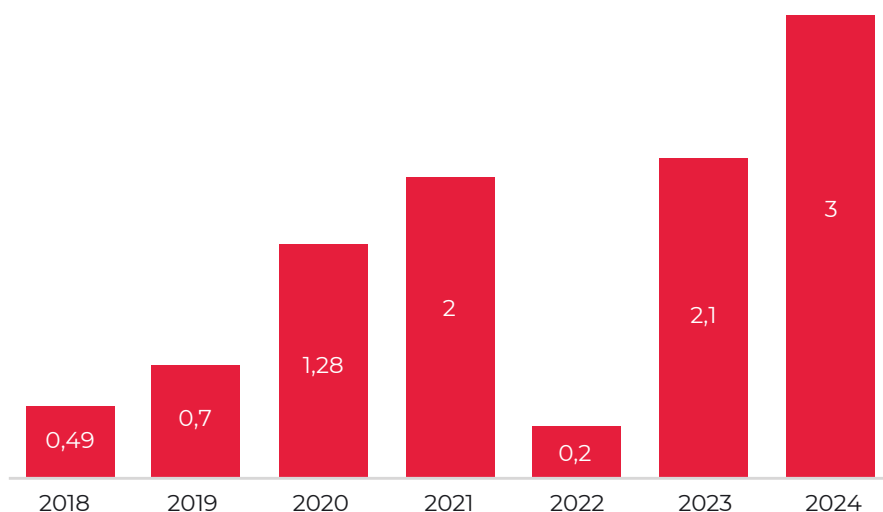
— Year-Round Navigation

One of the most significant stages in the development of the NSR was the opening of year-round navigation, which involved solving many technical and infrastructural problems, since the implementation of year-round navigation along the Northern Sea Route will only be possible after the creation of a fleet of vessels equipped with an Arctic ice class of at least Arc7.

An example of a successful transition to year-round navigation along the NSR was demonstrated by the gas carriers of PAO NOVATEK, which in January and February 2021 successfully completed winter voyages through the Eastern Arctic to China. An important role in this process is played by the charter logistics scheme, in which icebreaker vessels deliver cargo across the Arctic, and then transfer it to more southern ports to vessels for navigation in mild climatic conditions. This method is already used for transporting LNG, which makes deliveries from the Arctic to Asia cost-effective.

In addition, year-round navigation opens up opportunities for increasing transit traffic, as evidenced by the growth in the volume of transit cargo, which reached a historical record in 2023 (2.129 million tons) and 2024 (more than 3 million tons).

TRANSIT VOLUME VIA NSR (MILLION TONS)

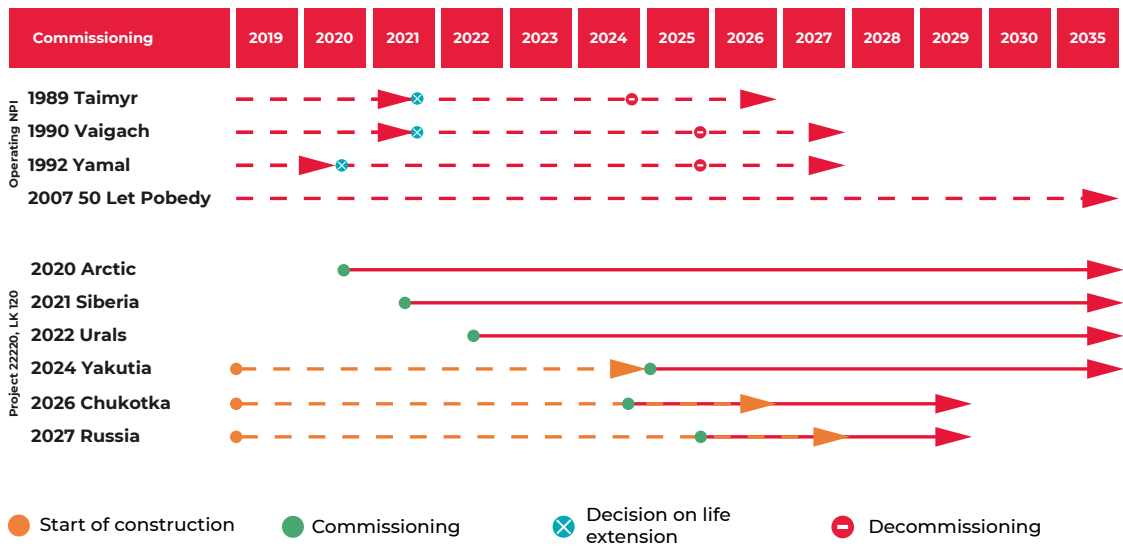


Source: The schedule is based on reports from the press service of the Russian Ministry of Transport and the press service of Rosatom

In the coming years, the development of year-round transportation along the NSR will depend on progress in the creation of icebreakers and the coordination of Russia's efforts to ensure the safety of navigation on this route.

In 2024, Russia continued the modernization of its icebreaker fleet, including the construction of powerful new nuclear icebreakers, such as the Lider (Project 10510), which will become the flagship of the Arctic fleet. Its capacity is 120 MW, and the cost of the project exceeds 120 billion rubles. Besides that, the existing fleet (10 icebreakers, 7 of which are nuclear) is actively used.

ACTIVE ICEBREAKER FLEET



Source: Rosatom

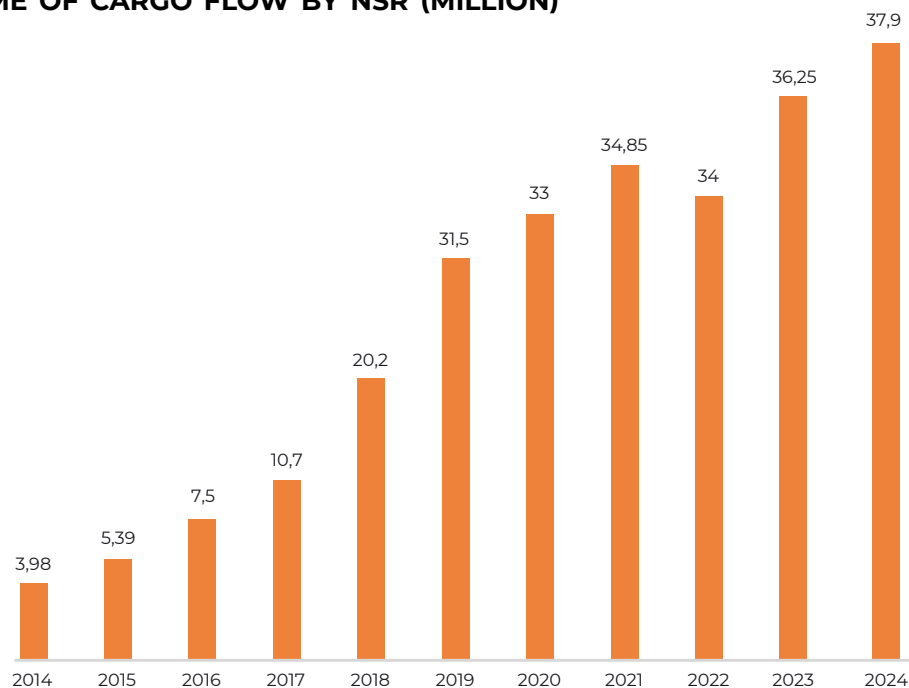
Another priority area for ensuring year-round navigation is the Eastern Sector of the NSR, where LNG is mainly transported. By 2030, it is planned to expand the icebreaker group, including for work in the eastern sector of the NSR, to 17 icebreaker vessels. An important element for year-round navigation in this area was to be the new generation gas carriers of the Arctic LNG 2 project of the Arctic ice class Arc7. These vessels have no restrictions for year-round navigation in the conditions of the Eastern Northern Sea Route.

At the present stage, year-round navigation in the Eastern part of the Northern Sea Route began to be implemented with a delay. Until late June 2024, there were no eastward voyages. Arc7 class gas carriers only **carried out westward voyages**, with deliveries to Europe or transshipment in the seaport of Murmansk. This fact shows the existing difficulties with the capacity to transport current volumes, which can only be finally resolved with the commissioning of Russian Arctic-class vessels.

CURRENT STATE OF PROSPECTS OF NSR LOGISTICS

Freight transportation statistics

VOLUME OF CARGO FLOW BY NSR (MILLION)



Source: authors' calculations based on open sources.

In 2024, the volume of cargo transportation along the NSR reached a record high of 37.9 million tons, which is 4.4% more than in the previous year.

According to InfraNews, container turnover along the NSR in 2024 **showed significant growth**, reaching 193.8 thousand TEU, which is 17.7% (29.08 TEU) higher than in 2023 (164.7 thousand TEU).

The main volume of container handling was cabotage, which increased by 8.3% (almost 14 thousand TEU) over the year, reaching 176 thousand TEU. At the same time, export handling increased 13-fold, amounting to 10.5 thousand TEU, and import handling increased sixfold, reaching 6.9 thousand TEU.

These figures are due, among other things, to the state's increased interest in subsidizing cabotage transportation along the NSR. The program to subsidize regular cargo transportation along the Northern Sea Route was initiated in 2022 - annual subsidies from the federal budget amount to 560 million rubles. **In total**, the government plans to allocate more than 7.8 billion rubles to subsidize transportation by 2035. These funds are intended to compensate carriers for lost income caused by preferential tariffs, as well as to cover expenses associated with

ship calls at ports.

In July 2023, Mikhail Mishustin [approved a Resolution](#) according to which participants in the program to subsidize cabotage transportation along the NSR were given the opportunity to include the ports of Arkhangelsk and Nakhodka in their routes.

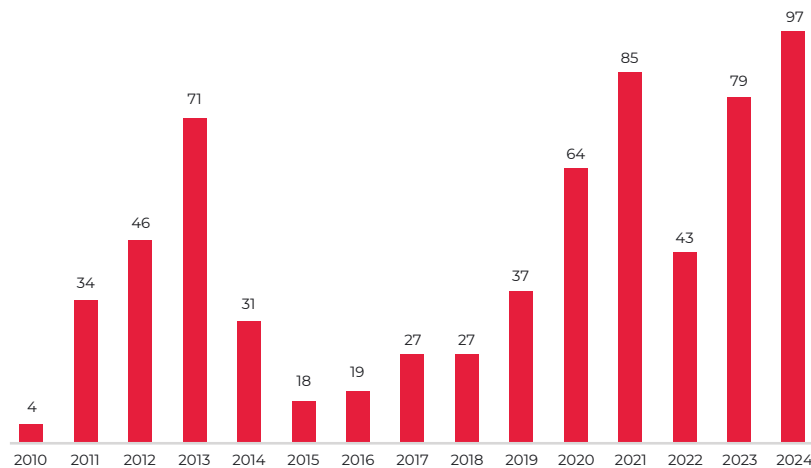
Currently, the list of ports covered by this program includes: the Big Port of St. Petersburg, Arkhangelsk, Murmansk, Dickson, Tiksi, Pevek, Petropavlovsk-Kamchatsky, Magadan, Vostochny, Nakhodka and Vladivostok.

The dynamics of container cargo transshipment by quarters showed significant fluctuations. In the first quarter, the transshipment volume amounted to 41 thousand TEU - slightly below the level of 2023 (44 thousand TEU). In the second quarter, a volume of 37 thousand TEU was recorded, which indicates a slight increase compared to the same period of the previous year (34 thousand TEU in 2023). In the third quarter, there was a sharp increase to 63 thousand TEU - this figure significantly exceeds the figures of previous years and is due to the launch of Chinese container services and the growth of transshipment volumes in the port of Arkhangelsk. In the fourth quarter, the transshipment volume amounted to 53 thousand TEU, also demonstrating positive dynamics compared to 2023 (46 thousand TEU). The main contribution to this growth was made by the largest ports of the country, in particular the port of Arkhangelsk, which showed an increase of 14.5 thousand TEU (+44.8%) with a total share in container turnover along the NSR of 24.2%, and the port of Murmansk with an increase of 8.9 thousand TEU (17.9%) with a share in container turnover along the NSR of 30.4% - the growth was mainly due to export and cabotage transportation. The leader in terms of container turnover (33.1%) remains the port of Dudinka, mainly serving the cargo flow of MMC Norilsk Nickel, which, however, did not show a significant increase in container turnover (in 2024, it amounted to 300 TEU). The entire container turnover of the port is made up of cabotage transportation.

The port of Sabetta became the leader in relative growth indicators: 213.4% compared to 2023, while the port only accounts for 3.9% of the NSR's total container turnover. The ports of Pevek and Anadyr account for 4.5% and 3.6% of total container turnover, respectively, and other Arctic ports account for only 0.2%.

Thus, the growth in container turnover on the NSR in 2024 is due not only to the seasonal increase in transshipment, which is traditionally observed in the second half of the year with the start of navigation along the NSR, but also due to the launch of new Chinese container services and the development of a subsidy program for cabotage transportation.

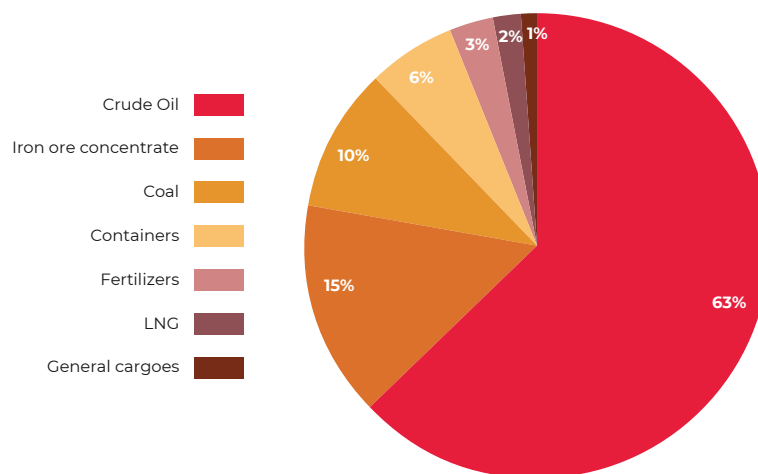
NUMBER OF TRANSIT FLIGHTS ALONG THE NSR



Source: authors' calculations based on open sources.

According to Rosatom, transit shipments along the NSR increased almost 50%, exceeding the 3 million ton mark. The number of transit voyages reached 97, which is a record figure. In 2024, transit shipments were carried out in three main directions: from Russia to China, from China to Russia, and between western and eastern ports within the country. Domestic routes accounted for 36 shipments, including both west-east and east-west movements; 34 voyages were made from Russia to China, and 27 from China to Russia.

STRUCTURE OF TRANSIT TRAFFIC ALONG THE NSR AS OF NOVEMBER 2024



Source: authors' calculations based on data from the [Centre for High North Logistics](#).

Crude oil remains the most important transit cargo, accounting for 62% of all shipments. In 2024, 1.89 million tons of oil were transported in 18 trips from Primorsk, Murmansk and the Prirazlomnaya platform.

Bulk cargo took second place in terms of NSR transit shipments, reaching 877 thousand tons. Iron ore concentrate accounted for most of this, with a volume of 475 thousand tons (15%). Coal transportation included three trips from Ust-Luga and one from Murmansk, a total of 316 thousand tons (10%). In addition, two trips with a total volume of 86 thousand tons (3%) of fertilizer were made from St. Petersburg.

The majority of cargo, accounting for 95% of the total transit volume, is sent from Russia to China, reaching a volume of 2.9 million tons. Transportation between Russian ports accounts for less than 1% of the total volume of cargo traffic. This fact underscores the strategic importance of the NSR as part of the trans-Eurasian trade routes linking Russia with Asia.

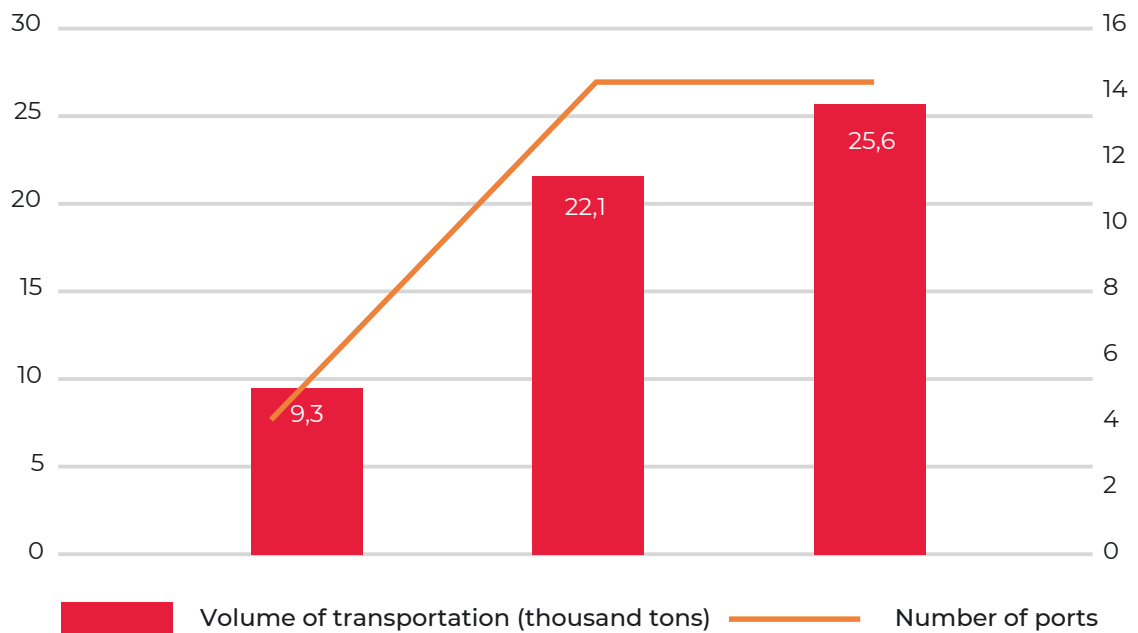
DISTRIBUTION OF CARGO ON THE NSR BY TYPE AND DIRECTION OF TRAVEL

Cargo Category \ Voyage Direction	East	West	Total (thousand tons)
Crude Oil	1890	0	1890
Bulk Cargo	877	0	877
Iron ore concentrate	475	0	475
Coal	316	0	316
Fertilizers	86	0	86
Containers	82	98,3	180,3
LNG	72	0	72
General cargo	8,2	35,2	43,4
Oil products	0	2	2
Fish and sea food	0,75	1	1
Ballast	0	0	0
Total	2929,9	136,5	3066,5

Source: [Centre for High North Logistics](#)

Container transit traffic along the NSR makes up a small share of the total transit cargo flow (6%). In 2024, 180.3 thousand tons of container cargo were transported. Container voyages were mainly carried out between Chinese ports and the Russian ports of Arkhangelsk and St. Petersburg. Cargo shipped from China to Russia includes auto parts, construction equipment and materials, cars, and from Russia to China - lumber, cellulose, polyethylene and cardboard. An interesting feature of 2024 was the change in the route for transporting containers with socially significant cargo: now the cargo is delivered to Arkhangelsk, and then sent along the NSR to the ports of Magadan, Korsakov and Petropavlovsk-Kamchatsky - this allows for the optimization of logistics and a reduction of dependence on the traditional route through Vladivostok.

DYNAMICS OF CABOTAGE TRANSPORTATION ALONG THE NSR AND THE NUMBER OF PORTS FOR SHIP CALLS (2022-2024)



Source: authors' calculations based on open sources.

During the first year of the subsidy program, two round trips were carried out, while in 2023 their number increased to three. The first and third trips were carried out by the nuclear-powered cargo ship Sevmorput, and the second trip was carried out by the motor ship Severny Proekt, which [traveled along the route](#): Arkhangelsk - Pevek - Vladivostok - Magadan - Petropavlovsk-Kamchatsky - Pevek - Arkhangelsk.

In 2024, the program also demonstrated positive results. In 2024, three subsidized cabotage trips were carried out, organized by the Ministry for the Development of the Russian Far East, Rosatom and Atomflot. With the help of subsidized flights in 2024, [25.6 thousand tons of cargo](#) were transported, which is 15.8% more than in 2023 (22.1 thousand tons), and 2.8 times more than in 2022 (9.3 thousand tons). In addition, over the three years of the program, the number of ports of call increased from 4 to 14.

CHINA'S VIEW OF THE NSR

The interest of external actors plays a major role in the development of container logistics on the NSR. Thus, China is considered a key partner of Russia in the context of the development of the NSR due to its significant experience in the construction of infrastructure, including ports, as well as the availability of technologies that can facilitate the development of the route.

China's special interest in the NSR is natural in the context of China's participation in the Arctic region, which began to gain significance in the early 2000s. In 2013, China became a permanent observer of the Arctic Council, which demonstrated its desire for more active interaction in this strategically important region².

Following the introduction of international sanctions against Russia in 2014, China significantly increased its share in the Yamal LNG project. The China National Petroleum Corporation and the Silk Road Fund **acquired** stakes in the project: 20 percent and 9.9 percent, respectively. Thus, the total share of Chinese investment in the project reached almost 30%. During the implementation of the Yamal LNG and Arctic LNG 2 projects, China provided **significant technical support** to NOVATEK through contracts for the supply of equipment and the provision of various services. In 2017, China included the Arctic in its Belt and Road Initiative, **introducing the concept** of "blue economic corridors," one of which was "the route connecting China with Europe via the Arctic Ocean."

In 2018, China published a White Paper on Arctic policy, in which it called itself a "near-Arctic state" for the first time. Chinese President Xi Jinping has previously stated that China is ready to join the ranks of the "great polar powers," underscoring the country's ambitions in the Arctic region. China has also announced **plans to create** a "Polar Silk Road," which will be part of China's initiatives to expand trade and economic ties in the Arctic region.

In March 2023, during a meeting with Chinese President Xi Jinping, President Vladimir Putin **announced** Russia and China's readiness to create a joint working body for the development of the Northern Sea Route.

On June 6, 2024, at the 27th St. Petersburg International Economic Forum in St. Petersburg, the Chinese shipping company Hainan Yangpu NewNew Shipping Co. Ltd and Rosatom signed a cooperation agreement to organize a year-round container line between the ports of the two countries using the waters of the Northern Sea Route. As part of the agreement, the companies also plan to create a joint venture for the design and construction of icebreaking container ships.

² Zinnatullin D.A. A comparative analysis of China's and India's policies in the Arctic at the present stage. Arctic XXI century. 2024;(1):78-95. (In Russ.)

THE ROLE OF KEY SHIPPING COMPANIES IN ORGANIZING CONTAINER TRANSPORTATION ALONG THE NSR

Ruscon (part of the Delo Group of Companies)	<ul style="list-style-type: none"> Organization of a seasonal service for the delivery of containers from central Russia to remote regions of the country
FESCO	<ul style="list-style-type: none"> Organization of regular container transportation along the NSR, ensuring delivery of consumer goods and food to the Far Eastern regions of Russia within the framework of the Northern Delivery Program Launch of the regular sea line "FESCO Arctic Line" between the ports of Pevek, Provideniya and the Chinese port of Qingdao Project transportation, including transportation of heavy and oversized cargo for nuclear power plants under construction abroad
Sakhalin Shipping Company (SASCO)	<ul style="list-style-type: none"> Organization of multimodal container transportation along the NSR to the port of Korsakov (Sakhalin) on subsidized flights
Hainan Yangpu Newnew Shipping	<ul style="list-style-type: none"> Launch of year-round transportation along the NSR Regular linear container transportation between the ports of St. Petersburg, Arkhangelsk and the base ports of China via the NSR Launch of the container service "Arctic Express No. 1"
Safetrans Line	<ul style="list-style-type: none"> Organization of the Flying Fish 1 flight via the NSR. The company plans to continue using Flying Fish 1 for work on the NSR
Beltamozhservice	<ul style="list-style-type: none"> Organization of a trial supply of logistics services through SMP for Belarusian enterprises

Source: authors' calculations based on open sources.

In September 2023, in cooperation with NewNew Shipping Line, the Arctic Express No. 1 route for the delivery of export-import cargo was launched, which connects Arkhangelsk with the main ports of China - Shanghai and Ningbo, after which the cargo is delivered by rail to Moscow and St. Petersburg. The total length of the route is 1,200 km by rail and 6,600 nautical miles.

In August 2024, the first ship delivered approximately **500 containers** of car parts, household appliances and consumer goods from China to Arkhangelsk.

Also in 2024, Safetrans Line organized a voyage of the Flying Fish 1 container ship with a capacity of 4,843 TEU. The ship was escorted by the GlavSevmorput enterprise, which is part of Rosatom.

The container ship's route began in St. Petersburg and ended in the Chinese port of Qingdao. Flying Fish 1 delivered 664 twenty-foot and 1,727 forty-foot containers. It took the vessel about six days to pass through the NSR. According to MarineTraffic, the container ship arrived in Qingdao on October 1, 2024. This voyage demonstrated the potential of the NSR as a strategic route for container shipping between Europe and Asia. Despite the limited navigation period for ships without ice class, ending on October 15, Safetrans Line is already considering the possibility of using Flying Fish 1 again next year.

Overall, the number of Chinese shipping lines on the NSR doubled in 2024, from seven lines in 2024 to [14 lines in 2024](#).

In addition, the FESCO Arctic Line sea container service, launched in September 2020, operates on the NSR. The service connects key transport hubs in China and Russia. The line transports cargo along the Qingdao (China) – Chukotka (Russia) route, passing through the ports of Pevek and Provideniya.

The service includes three main routes:

1. FAL-1: Tsindao — Taicang — Provideniya — Pevek route with a transit period of 22 days.
2. FAL-2: Vladivostok – Taicang – Provideniya – Pevek route with a transit period of 23 days.
3. FAL-3: Vladivostok – Vostochny – Pevek route with a transit period of 17 days.

A special feature of FESCO Arctic Line is the ability to carry out both interport transportation and direct mixed rail-water transportation.

The service is focused on the transportation of goods in difficult Arctic navigation conditions, for which the ice-class vessels "FESCO Ulysses" and "FESCO Paris" are used. FESCO Arctic Line operates as a seasonal line, available from July to November.

In 2023, the FESCO Arctic Line sea container service completed nine voyages and [transported](#) more than 100 thousand tons of cargo from Chinese ports to Pevek.

In addition, FESCO is actively developing intermodal services, expanding cooperation with Chinese companies to increase cargo transportation volumes.

FESCO is actively cooperating with Chinese partners in the construction of distribution centers and new terminals.

Due to the emergence of new container services with the participation of China, cargo handling rates at Russian ports have increased significantly. In 2024, the volume of cargo handling at the [port of Arkhangelsk increased](#) by 45% compared to the previous year, reaching 47 thousand TEU. The port of Murmansk recorded an increase of 18%, to 58.9 thousand TEU.

Also in recent years, India has shown an active interest in the NSR. In the future, projects such as the creation of a Russian-Indian trans-Arctic container line, the expansion of the fleet and the construction of processing facilities near the NSR are being considered. These initiatives can be supported by state aid, including within the framework of Arctic programs.

In September 2023, an agreement was signed on the training of [Indian sailors](#) for work in the Arctic, and joint projects for the construction of diesel icebreakers are also being discussed. In addition, Russia and India are discussing the supply of Russian energy resources - oil, coal and LNG via the NSR to Indian ports with transshipment in the Russian Far East. Within the framework of the [Eurasian Container Transit project](#), there are plans to create a pilot container line for international transit via the NSR.

IT-ECOSYSTEM OF THE NORTHERN SEA ROUTE

In 2021, the **start of work** on a project worth about 2.9 billion rubles was announced; the state corporation Rosatom is responsible for its implementation. The project, called the Unified Platform of Digital Services of the Northern Sea Route (UPDS NSR), should serve as the basis for a digital ecosystem that ensures the effective management of shipping, navigation and safety along the route.

The digital platform will integrate various services, offering users the opportunity to receive up-to-date information on weather conditions, ice conditions, the location of vessels, as well as data for route planning and calculating travel time.

The platform's areas of work include navigation safety, hydrometeorological support, navigation and hydrographic support, and environmental monitoring. For each of these, there are plans to create special digital products presented to users in a convenient form - from cartographic layers to analytical reports and summaries. The key components of the system will be onboard measuring systems and ice reconnaissance systems based on unmanned aircraft systems - this will improve the accuracy of information and the efficiency of decision-making. Based on this information, services will be provided to shipping companies: registration of permits for the passage of vessels, dispatching, monitoring and fleet management. By the beginning of 2025, 27 digital services out of the planned 34 are planned to be implemented on the platform.

SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • The shortest shipping route between the western part of Eurasia and the Asia-Pacific region (18 days to Japan versus 32 via the Suez Canal) • No piracy • Provided there is no need for icebreaker escort, transit via the NSR is not subject to additional duties • Significantly lower risk of congestion and its consequences in the absence of a large volume of transportation 	<ul style="list-style-type: none"> • Dependence on weather and ice conditions • Infrastructure limitations: <ul style="list-style-type: none"> • The current system of meteorological and radio navigation support for the NSR does not fully ensure the safety of navigation • Limited port capacity: the total capacity of seaports in the NSR waters as of 2024 is 47.5 million tons • Disunity and lack of coordination between ports located along the NSR hinders their effective interaction • Shortage of ice-class cargo fleet • High operational risks: <ul style="list-style-type: none"> • unstable weather conditions increase risks for ships, especially when moving in high latitudes • the need to attract highly qualified personnel

- lack of search and rescue resources: in the harsh climate and remoteness of the region, delays in eliminating the consequences of accidents can lead to serious consequences for the vessel, crew, cargo and the environment
- Increased cost of voyages along the route in winter due to the need for icebreaker support

Opportunities	Threats
<ul style="list-style-type: none"> • High potential demand for a short route between Europe and Asia • China's interest in the new route and resources of the Far North, deepening cooperation with China and other countries within the framework of NSR projects: active participation of companies such as Hainan Yangpu NewNew Shipping Co. Ltd, Safetrans Line, growing volumes of container traffic between Russia and China, expansion of routes and the launch of new services such as Arctic Express No. 1 • Potential increase in the navigation period and traffic intensity on the NSR due to global climate change • To solve the icebreaker shortage and improve transport infrastructure, it is possible to attract vessels from international partners • Implementation of satellite programs such as Arktika-M and Express-RV • Government support and investment: a subsidy program for cabotage transportation, the NSR Development Plan until 2035, the Project for the Creation of the Eastern Transport and Logistics Hub of the NSR, the National Project "Efficient Transport System" (including the Federal Project "Development of the Great Northern Sea Route"), the allocation of significant budget funds for the modernization of ports, construction of terminals and vessels • Synergy and economies of scale from the implementation of large infrastructure projects ("Power of Siberia-2" and other LNG facilities) 	<ul style="list-style-type: none"> • Climate regulation: The International Maritime Organization has approved a ban on the use of heavy fuel oil in Arctic waters, effective July 1, 2024 • Competition with other routes • Dependence on commodities markets • Dependence on political will to implement the NSR development project: for the NSR to function effectively, constant support in the form of government regulation and funding is needed • Unbalanced plans for the renewal of the icebreaker fleet, as well as long construction times for new vessels • The use of icebreakers and fleets of other countries (e.g. China, India) for transportation along the NSR may lead to increased external control and the desire of international players to establish international regulation of the NSR

Source: authors' calculations based on open sources.

CONCLUSION

The key trends in the development of the NSR for 2025-2026 suggest a further strengthening of its position in international maritime logistics. Growing interest in the NSR is associated with the development of international trade, changes in climate conditions and the possibility of modernizing its infrastructure.

In particular, it is expected that the NSR will become increasingly important as a route for transporting goods between Asia and Europe, especially against the backdrop of geopolitical instability and the rising cost of traditional routes (congestion, security threats to ships and vulnerability to foreign policy risks of the route through the Suez Canal). This is evidenced by the growing volume of transportation along the NSR: in 2024, it amounted to about 37.9 million tons. According to the baseline scenario of Rosatom State Corporation, by 2031, cargo traffic may reach 117 million tons, or 150 million tons, according to the best-case scenario.

The NSR development plans for the coming years include the creation of a container park for transit and cabotage transportation, as well as the creation of a Russian container operator. There are plans to ensure year-round shipping along the entire route by 2030. An important element is the creation of transport and logistics hubs in the West and East, as well as the construction of railway approaches to the NSR.

In the context of sustainable growth in trade turnover between Europe and Asia, the NSR has the chance to become a seasonal alternative to the Suez Canal. In addition, the NSR has significant potential due to the large reserves of resources in the region, including oil, gas and mineral resources, which could serve to increase cargo traffic.

State support plays a key role in the development of the NSR as a strategically important transport corridor. The Russian government is actively using budget financing to attract the largest oil and gas companies to implement infrastructure projects on the NSR, seeking to stimulate the interest of external players in the route. As the route's infrastructure develops, private capital participation, including that of foreign companies, in NSR projects is expected to increase.

However, the current capabilities of the NSR are limited by a number of factors. The main challenges remain the seasonality of navigation, caused by dependence on weather and ice conditions, the need for icebreaker support, and insufficient infrastructure development. Environmental risks and harsh climatic conditions continue to impose additional restrictions on the use of the route.

To fully realize the potential of the NSR, large-scale investments in infrastructure, the development of the icebreaker fleet, the introduction of innovative technologies and a comprehensive solution to environmental problems are necessary. International cooperation aimed at increasing the efficiency of the route is also important.