13 International Shipping and the Northern Sea Route

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Introduction

The Northern Sea Route (NSR) is the Russian term for the waterways north of Siberia. They form a part of the Northeast Passage (NEP), which is the historical term for the Arctic Sea passage between the Atlantic and the Pacific. Whereas NEP is a loose term, without strict geographical boundaries, the NSR is now precisely defined, as starting with the entry to the Kara Sea and stretching all the way to the Bering Strait. Northwards, it extends 200 nautical miles from the coast. In the Russian legislation, it is referred to as a 'water area' – *akvatoriya*. Within this area, there are several alternative shipping lanes which can be chosen depending on the ice situation or a vessel's water depth requirements (Figure 13.1).

The Russian regulations for shipping within this area are contested by some states, notably the United States. They hold that the regulations go further than permitted under the law of the sea. Nonetheless, commercial users respect the Russian administration (Solski, 2020).

During Soviet times, the NSR was open to foreign shipping only exceptionally. This changed with the speech by Mikhail Gorbachev in Murmansk in 1987, where he called for international cooperation in the Arctic generally and in shipping specifically (Åtland, 2008). In early 1991, the NSR was officially opened to international shipping. The decision was spurred by a reassessment of the security situation and the expectation of economic benefits. However, political declarations alone do not spur commercial interest. Use of the sea route, which peaked in 1987, plummeted after the collapse of the Soviet Union. The comprehensive International Northern Sea Route Programme was carried out in the 1990s analyzing the conditions and potential for international use of the sea route, but the international shipping industry generally felt that the ice situation made regular commercial navigation unpredictable and unsafe (Ragner, 2000).

This mood changed with the publication of reports documenting a receding ice cover (ACIA, 2005) at the same time as the US Geological Survey assessment for 2008 of the hydrocarbon potential in the Arctic attracted worldwide attention (Gautier et al., 2009). The Arctic Council initiated the Arctic Marine Shipping Assessment produced by its Protection of the Arctic Marine Environment (PAME) working group (AMSA, 2009). The comprehensive report, including

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Figure 13.1 Map of the Northern Sea Route.
Source: Fridtjof Nansen Institute.

both opportunities and challenges from Arctic shipping and with strong emphasis on marine safety and environmental protection, was published in 2009. The NSR started to attract considerable commercial attention and the Russian government made development of the NSR a high priority (Moe, 2014).

New regulations and procedures were adopted, including swift processing of applications to navigate the sea route and a reformed fee system. Changes were explicitly intended to increase interest among international users. Expectations were high since rapidly melting sea ice made use of the NSR for international transits between the Pacific and the Atlantic look increasingly viable.

In parallel, reflecting the global interest in the Arctic environment, the International Maritime Organization negotiated an International Code for Ships Operating in Polar Waters, which came into force in 2017. Russia is a party to the Polar Code, which covers both marine safety issues and environmental protection and was active in the negotiations. Chircop and Czarski (2020) conclude that there is a "substantial degree of harmonisation" between the Code and the Russian regulations. The main criticism of the Code is that parts of it exempt large portions of Arctic shipping, namely ships, used only for domestic voyages.

In this chapter, we will look at the role international cooperation and participation came to play in shipping on the NSR and the outlook for the continued involvement of the international shipping industry. First, we review the international shipping activity on the NSR over the last decade. Then we discuss driving forces and forces of deterrence, followed by necessary preconditions for wider usage of the route seen from the perspective of international shipping, and evaluate Russian plans and policies affecting international shipping. In the concluding section, we briefly summarize the key points and outline the most likely development over the next several years.

International shipping on the NSR 2010–2019[1,2]

Regular transit shipping on the NSR began in 2010. From 2011, several international transit voyages between European and Asian Pacific ports as well as destination voyages from NW Russia (Murmansk) to the Asian Pacific were organized annually (Table 13.1). In 2010–2013, most of the cargo was liquid hydrocarbons (gas condensate, naphtha, *liquefied natural gas* [LNG], jet fuel, gas oil, and heavy oil) in addition to coal and iron ore.

The main cargo owners were Russian (Novatek and Eurochem), followed by South Koreans, Norwegians, and Canadians. These early voyages enjoyed considerable support from the Russian government (through the state icebreaker company Atomflot) and many of them were mainly meant to test the technical feasibility of shipping on the NSR by Arc4 ice-class cargo vessels during the summer-fall season with assistance from Russia's nuclear icebreakers.[3] In addition to tankers, bulk carriers, and a few LNG carriers, other types of vessels transiting the NSR were reefers, research vessels, icebreakers, and passenger vessels. Nordic shipping companies operating several ice-class A1 (Arc4) tankers and bulkers in the Baltic Sea during the winter had an advantage over other shipping companies, including many Russian companies. Several of these vessels were used in international shipping on the NSR during the summer-fall season. Thus, 49% of all transit voyages via the NSR 2010–2013 were made by Nordic shipping companies (Danish, Swedish, and Finnish) or 64% if we exclude voyages involving Russian companies. During this time, companies from 13 countries were participating in international shipping via the NSR.

Table 13.1 Annual number of voyages and cargo volume for international transits on the NSR between the Atlantic and Pacific during the period of 2010–2019.

Year	*International Transit*	*International Transit Cargo (t)*	*Destination Voyage*	*Destination Voyage Cargo (t)*
2010	1	41,000	1	70,165
2011	4	185,243	14	590,102
2012	9	337,371	17	793,315
2013	14	633,791	14	484,097
2014	4	72,472	2	0
2015	6	34,938	1	0
2016	8	201,946	5	0
2017	12	154,415	4	20,253
2018	17	339,070	2	144,499
2019	14	285,245	8	361,094
TOTAL	89	2 285,491	68	2 463,525

Note: The same information is also shown for those destination voyages that took place between NW Russia (outside the western border of the NSR, mainly Murmansk) and ports in the Asian Pacific region, sailing through both the western and eastern boundaries of the NSR. The annual number of all destination voyages during 2016–2019 is shown in Figure 13.3.
Source: Gunnarsson and Moe (2021).

The global economic recession of 2014 had a major impact on the NSR. The transportation of liquid hydrocarbons and iron ore along the NSR to the Asian Pacific market that had dominated transport on the NSR during 2010–2013 came to a standstill. The only hydrocarbon transport was one shipment of coal from Vancouver in Canada to Finland. The remaining cargo was some general cargo and frozen fish and meat. Freight rates were depressed as shipping companies struggled with overcapacity of tonnage. This meant that time saved using the Arctic route became less important for the economy of transporting cargo. Commodity prices of raw materials fell sharply due to declining demand, especially in Asia, and the previous price differences between European and Asian markets were evened out. This dampened the interest in more costly transport of Arctic commodities to Asian markets. Instead, the decreased value-to-weight ratio of transported goods put emphasis on "economy of scale", making it more profitable to transport commodities on very large vessels going through Suez or around the Cape of Good Hope. Reduced bunker fuel prices also meant that lower fuel consumption on shorter voyages via NSR compared to southern routes was less significant for the economic calculations of shipping operators and cargo owners.

Also contributing to the lack of interest in international shipping on the NSR during the period of 2014–2015 were the US/EU economic sanctions against Russia starting in 2014 in the aftermath of the Ukraine crisis and the subsequent countersanctions from Russia. The ensuing geopolitical tensions did not encourage international shipping companies to become involved in NSR ventures that would require long-term investments in new ice-strengthened vessels.

The Russian authorities realized that their effort to rapidly increase international transit traffic on the NSR was not bearing fruit. Much larger numbers of voyages would be required to make international transits a source of income for Russia and justify the costly operations of its nuclear icebreakers.

Whereas the general interest of the international shipping industry in transit on the NSR seemed to be fading, there were exceptions. Having actively declared their interest in Arctic shipping for some years, China's COSCO Shipping established its own dedicated Arctic shipping business (Moe and Stokke, 2019), becoming the most active player in NSR transit shipping in recent years. This started with project cargo using general cargo and heavy-lift carriers. But the company also constructed a series of ice-strengthened combined bulk and container ships of a size suitable for the Arctic. With these ships, they opened a multi-purpose-vessel cargo route through the Arctic. In 2016–2019, 45% of international transits were done by COSCO, followed by several German companies with 25% (Table 13.1). This change underscores the fact that the cargo base is not a given and that new players may see new opportunities. Much has been made of the Chinese political interest in Arctic shipping and the potential for cooperation with Russia. However, as shown by Kobzeva (2020), there are considerable discrepancies in the interests of the two countries, and Chinese shipping infrastructure investments have not materialized. Despite the Chinese engagement, international transits have been totally dominated by spot-market deliveries of

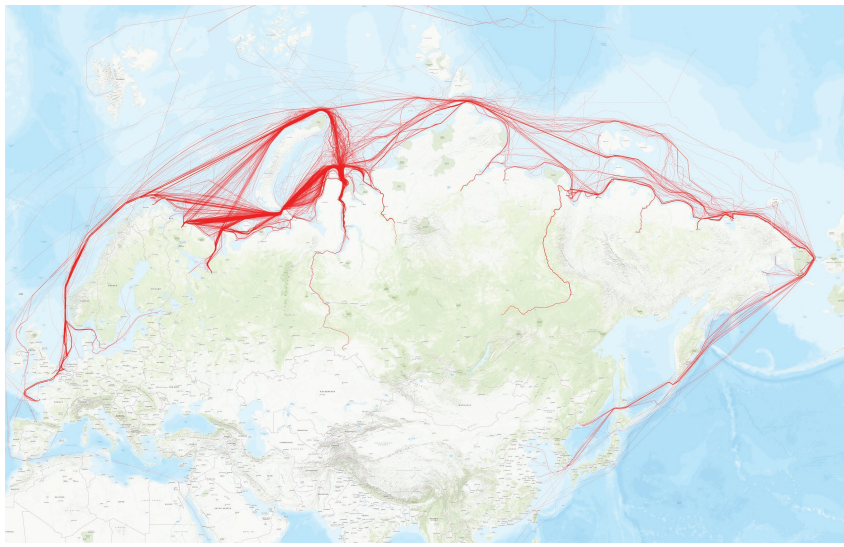

Figure 13.2 Sailing tracks of vessels operating on the NSR in 2018, based on Automatic Identification System (AIS) data. Most of the shipping activity on the NSR occurs in the SW Kara Sea.
Source: Gunnarsson and Moe (2021).

commodities and transport of project cargo, and vessel repositioning between the Atlantic and Pacific markets. All these reflect short-term decisions by shipping companies and cargo owners and not long-term strategies.

At the same time as the outlook for growth in international transits was looking more uncertain, Russia focused on domestic and destination shipping on the NSR servicing resource extraction projects in the Ob Bay/Yenisey area (Figures 13.2 and 13.3). By 2016, Atomflot had signed contracts for icebreaker support with all current project developers in the area. For international shipping companies involved in transit shipping, it therefore became clear that Russian natural resource projects would increasingly occupy the capacity of Russia's nuclear icebreakers.

The development of energy projects, however, presented other opportunities for international shipping. In 2016–2017, Norwegian companies provided support and supply vessels for offshore operations in the Ob Bay and Kara Sea, and companies from the Netherlands, Belgium, and Luxembourg became engaged in extensive dredging operations in the Ob Bay. Other non-Russian companies provided general cargo vessels, bulkers, heavy-lift carriers, and drilling rigs in support of Russian natural resource project development. The largest number of non-Russian companies in domestic shipping (cabotage) was in 2016 and 2017, with up to 23 companies operating each year. Most of these voyages were between Murmansk and Sabetta in the Ob Bay.

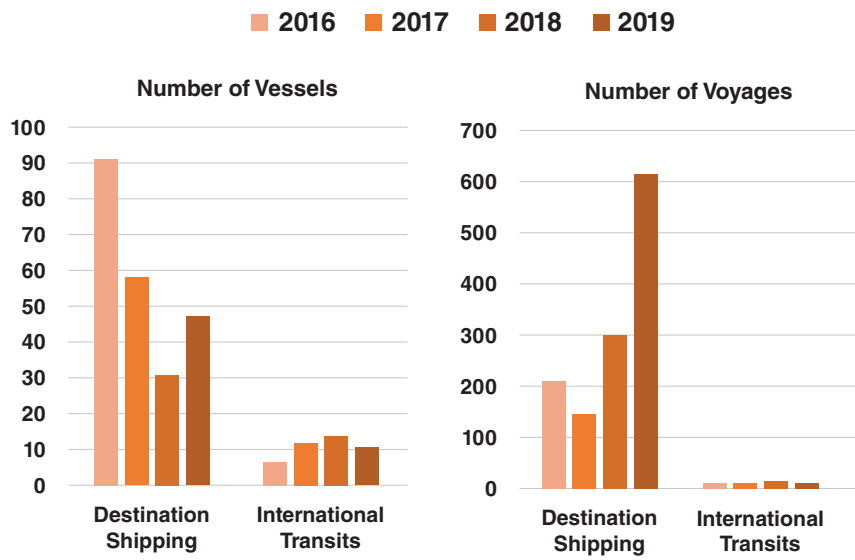

Figure 13.3 Number of vessels and voyages involved in destination shipping and international transit shipping on the NSR 2016–2019. The port of departure or arrival in destination shipping was almost exclusively Sabetta on the Yamal peninsula.

Source: Gunnarsson and Moe (2021).

European shipping companies were also involved in destination shipping in 2016 and 2017, transporting prefabricated LNG modules and other project cargo on heavy-lift carriers and general cargo vessels to the Yamal LNG plant at the port of Sabetta (Figure 13.3). The LNG modules originated from several construction yards in China and Indonesia and were shipped via the Suez route, first to Zeebrugge in Belgium and other European ports before onward shipment to Sabetta. Several shipments also came through the Bering Strait during the summer-fall season. Most of the European shipping companies transporting heavy project cargos to Sabetta were from the Netherlands, followed by Germany.

Shipments of LNG from Sabetta started in December 2017. This is carried out by three non-Russian companies in addition to Russia's Sovcomflot, on long-term charter contracts. The foreign-owned LNG carriers are operated by Dynagas (Greece), Teekay Shipping LNG (operated from the UK) and Mitsui O.S.K. Lines (Japan). These companies established joint ventures with subsidiaries of China's COSCO Shipping to finance the construction of their new fleet of 15 Arc7 LNG carriers for Yamal LNG at a price of some 300 million USD each. The first shipments involved direct transports from Sabetta to western European ports for unloading, or ship-to-ship transshipment to conventional vessels near Honningsvåg off the northern coast of Norway (Figures 13.2 and 13.3). The first

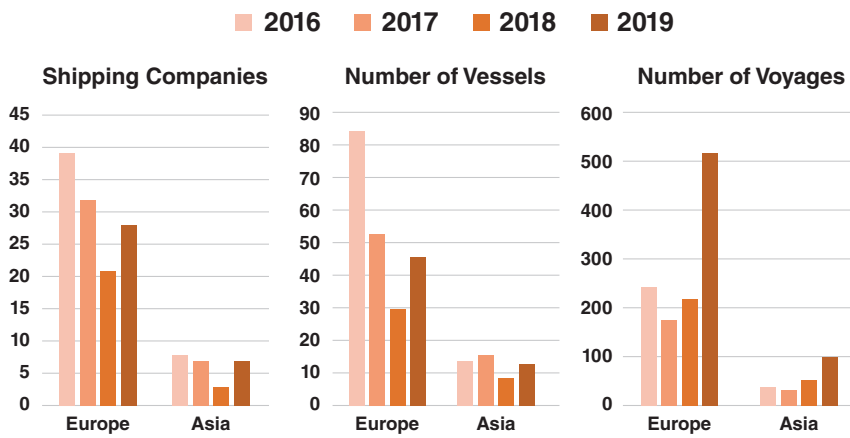

Figure 13.4 Number of European and Asian shipping companies/operators on the NSR in 2016–2019 and the number of their vessels and voyages on the NSR.
Source: Gunnarsson and Moe (2021).

direct shipment eastwards reached China in July 2018, followed by three additional voyages later that year. In 2020, 35 voyages went in the eastern direction, but the vast majority of shipments, some 219, went west to Europe according to the CHNL Information Office. Additionally, shipping companies from Greece and Germany were chartered to transport gas condensate from Sabetta to European ports.

As shown in Figure 13.4, there have been far fewer Asian shipping companies working on the NSR than European companies. Much more frequent voyages have also taken place between the NSR and European ports than ports in the Asian Pacific region.

In conclusion: International use of the NSR increased over the past decade but not in the way or to the extent many had expected. International transit shipping between the Atlantic and the Pacific saw only modest growth and did not become a significant component in international shipping. Real growth was in destination shipping between the Russian Arctic and ports outside the region, primarily between the Ob Bay and European ports, conducted by Russian and non-Russian companies, to an extent hardly foreseen ten years ago. Here we see a concerted effort of Russian companies and the Russian government to develop huge resource projects with maritime logistics where there are no alternative modes of transport.

Driving forces and forces of deterrence

A key condition for further development in the Russian Arctic is efficient and innovative Arctic logistics, largely based on maritime transportation.

The build-up of a new maritime infrastructure and transport and logistics system on the NSR, and along the whole Eurasian Arctic coast, will take many years and will be costly. Without cost sharing, the up-front capital costs are prohibitive and too high for Russia to take on alone. Russia is therefore hoping that international shipping companies and other foreign investors will take an active part in establishing the needed maritime infrastructure along the Arctic route. It is common for big shipping companies to invest heavily in port facilities in support of their own logistics operations along established transport routes (Falck, 2018). However, international shipping companies already using traditional routes will not easily alter their own long-established logistics operations.

Based on expectations of a future increase in trade volumes between the European and Asian markets, several shipping companies are closely monitoring the traffic and infrastructure development along the Arctic route (e.g., Beveridge et al., 2016; Milaković et al., 2018). This interest is further fueled by ongoing ship traffic congestion in the Strait of Malacca; instability in the Middle East and along the Strait of Hormuz that could impact shipping through the Suez Canal, and the persistent threat of piracy off the coast of Somalia.

For international transit shipping the obvious advantage of using the NSR instead of the traditional route through the Suez Canal is the reduction in the transport distance (30–50%) and sailing time (10–15 days) between ports in Scandinavia/NW Europe and NE Asia, assuming the same sailing speed on both routes. This can lead to substantial cost savings during the summer-fall season (July-November), when sea ice conditions are most favorable on the NSR and transport can proceed without icebreaker assistance. The precise distance advantage depends on the location of the departure and receiving ports – the further north ports are located, the greater the distance advantage of the NSR.

Yet, as discussed above, shipping costs are also impacted by the price of fuel, freight rates, and global market developments. When freight rates and bunker prices are low, the economic advantage of using the NSR compared to southern routes can be quickly lost, as occurred in 2014. Such factors will be considered by so-called opportunistic users of the NSR, that is, users who evaluate conditions on a short-term basis and compare them with other transport options. Potential investors using the sea route over the longer term need to consider several other factors.

Geopolitics and environmental-climate politics play a role. Tensions, sanctions, and countersanctions, higher trade tariffs, and regionalization are not conducive to the development of international shipping via the NSR. Perceptions of increased militarization – real or imagined – along Russia's northern coast are also likely to hold back foreign investments (Melino and Conley, 2019). The global push for reduced greenhouse gas emissions and more environmentally friendly operations, as reflected in the UN Sustainable Development Goals (SDGs), in particular SDG 13, on the urgent need to combat climate change and its impacts, is making large companies reluctant to engage in Arctic operations requiring long-term commitments. Several major shipping companies and owners of international brands, concerned about projected environmental risks having

reputational consequences, have already declared that they will not use the NSR or other Arctic routes (Schreiber, 2019). On the other hand, Russia can claim that shorter sailing distances using the NSR translate into reduced emissions. Moreover, if enough LNG-powered vessels are introduced, climate-related arguments in favor of the NSR will be strengthened.

Preconditions for increased international shipping on the NSR

An important prerequisite for the NSR's integration into the global transportation system is regular year-round shipping along the entire length of the route. Now, year-round shipping is only taking place in the western part of the NSR to European ports led by Arc7 LNG carriers, oil tankers, and container/multipurpose vessels. Year-round transport would need to be extended eastwards along the NSR to the Asian Pacific ports and include high ice-class bulk carriers, general cargo vessels/heavy-lift carriers, and larger container vessels with a high level of winterization.

To facilitate such a transport scheme, powerful icebreakers are essential in assisting transiting vessels and in keeping the Arctic route open year-round at acceptable commercial speed regardless of the sea ice conditions. This will include strategic deployment of several icebreakers along the whole length of the NSR, minimizing the consequences of accidents and transport delays due to sea ice.

To be of interest to commercial shipping, the NSR also needs to provide an acceptable level of predictability and punctuality of cargo transportation on a year-round basis. Regularity of supply of goods is no less important than the cost of transportation. This is particularly true for containerized cargo. The amount of bulk cargo shipped between NE Asia and Northern Europe is limited; the big trade volume is containers. Large-scale container shipping is problematic for the NSR but a prerequisite for the route's full integration into the global transportation system. Obstacles include unpredictability due to delays caused by unexpected sea ice conditions, draft limitations along the Arctic coast, and lack of markets along the route (e.g., Cariou et al., 2019).

To justify investments in expensive ice-class vessels, round-trip shipments with cargo in both directions between NE Asia and NW Europe would need to be the norm. An additional prerequisite is therefore the identification of a sizeable and sustainable cargo base, including containerized cargo, for trade between markets at opposite ends of the NSR. No such permanent cargo base has so far been identified.

High ice-class Arctic cargo vessels designed to operate under severe Arctic conditions during the winter-spring season and which can break sea ice up to two meters thick should not sail long distances in ice-free waters. A solution is to establish transshipment terminals located in ice-free waters at each end of the Arctic route and have conventional feeder vessels bring cargo to the terminals and deliver cargos from these to their final destinations. The establishment of transshipment terminals would mean that specialized Arctic shuttles could be fully utilized in the most efficient way. However, transshipment obviously involves

extra costs and time. The economics of such a scheme for the Arctic route is not yet clear.

An effective and predictable administrative and management system serving international shipping is also required. This would include connecting shipping companies with the best available navigational, sea ice, and communications services, providing traffic coordination and route optimization, marketing, and future traffic analysis and strategies. The icebreaker tariff system also needs to be user-friendly and fees must be able to compete with Suez and Panama Canal fees.

International commercial shipping companies will only use the route if it is considered safe and if all available means are in place to minimize impacts on the environment following strict risk mitigation measures. At the same time, the NSR management also needs to find ways to reduce risks of shipping delays due to sea ice by improving ice forecasting and ice reconnaissance. Before a voyage, detailed assessment and forecasting of ice conditions and other operational conditions *en route* needs to be accomplished and presented to NSR users.

Given the long distances, well-equipped land-based and offshore emergency stations must be strategically placed along the whole length of the NSR, enabling timely response to all kinds of maritime emergencies. Emergency services include refuge assistance and support for ships in distress, search and rescue operations, oil spill response, and salvage. Icebreakers and multipurpose emergency and rescue vessels will play an important role as floating support units in case of accidents.

For safety reasons and due to the remoteness and harsh climatic conditions that ships face on the NSR, year-round transit navigation needs to be supported by stable high-bandwidth satellite communication coverage throughout the NSR Water Area. This needs to include high resolution and near real-time satellite imagery of developing sea ice conditions along the vessels' sailing paths. The vessels should also receive analyzed (processed) satellite sea ice images and ice charts from public and private ice service providers. Such ice monitoring technology will assist vessels in choosing the optimal route through the sea ice in real time and limit operational risks and voyage delays.

At the end of the day, it is the global maritime industry that will decide when the shorter Arctic route is safe, efficient, reliable, environmentally sound, and economically viable in comparison with other routes across the world's oceans.

Russian policies impacting international shipping on the NSR

It is readily admitted by Russian authorities that the NSR needs comprehensive infrastructure improvements. The most recent official document is the "Plan for Infrastructure Development on the NSR until 2035", adopted by the Russian government in December 2019 (Plan, 2019). It stipulates measures to improve emergency communication, navigation infrastructure, to build new powerful icebreakers, to enhance the rescue capacity of both vessels and bases, and to develop port infrastructure. No official total budget exists, but estimates put total investments at approximately USD 20 billion, half of which will cover the const ruction of a series of new nuclear icebreakers (Burmistrova, 2019; Moe, 2020b).

The government counts on a substantial share being covered by maritime users and investors. Achieving the goals will clearly improve the conditions for shipping, including attractiveness to foreign users. However, the high costs involved and the ensuing financial requirements make postponements probable.

Rapid development of cargo transportation on the NSR has become a key goal in Russia's Arctic policy. A target of 80 million tons by 2024 (and continued increase thereafter) was first announced by President Putin in 2018, later repeated in other official documents, including the new Arctic Strategy of 2020 (Strategy, 2020). The commercial enterprises expected to implement this herculean task, both as cargo owners and transport companies – namely Novatek, Rosneft, Gazprom, Nornickel, Rosatom, and Sovcomflot – by necessity have become key players in the development of the NSR. These industrial stakeholders have a shared interest in an operative NSR which can bring inputs to large Arctic project developments as well as transporting the output to market. The Russian government is providing direct export access and long-term favorable tax conditions (Henderson and Moe, 2019; Moe, 2020a). An important question is how these companies will impact international cooperation in the shipping sector. One might expect that companies involved in natural resources extraction would prefer a liberal shipping regime which allows for competition between shipping companies offering transport services. However, the resource extraction industries are all closely intertwined with Russian state development policies. The logistical solutions for all these extraction projects are likely to be developed as large package deals, where long-term transport arrangements, state support, and ice-breaking services are included.

To ensure state control of all infrastructure developments and maritime operations on the NSR, Russia enacted a law in late December 2018 giving the state nuclear power corporation Rosatom control over current operations of the NSR and the management of state property and assets in ports. This came in addition to the nuclear icebreakers operated by its subsidiary Atomflot. Rosatom would coordinate and distribute state investments and collect state income. Navigational and hydrographical support would be the joint responsibility of Rosatom and the Ministry of Transport. The Ministry would be responsible for developing legislation and regulations and for ensuring their implementation and process applications for the use of the NSR through its NSR Administration, but important decisions would be made in consultation with Rosatom (Moe, 2020a). Thus, Rosatom and Atomflot have become responsible for the execution of state policy on the NSR at the same time as they conduct the running operations. Monopolization of services, in particular icebreaker services, may discourage international users planning long-term investments, as they may fear becoming totally dependent on Atomflot as regards specification of services as well as prices.

When Novatek's Yamal LNG project was developed, it seemed that international shipping companies would come to play a key role in the transportation of LNG, with 14 of the 15 custom-built carriers owned and operated by foreign companies, as noted above. However, as early as in 2018, Russia enacted legislation demanding that hydrocarbons from within the NSR be transported exclusively

on Russian-flagged vessels, and shortly thereafter a requirement to build new vessels for this purpose in Russia was introduced (Moe, 2020a). Neither regulation could be implemented immediately and completely. Exemptions from the flag requirement were granted to the carriers already delivered for Yamal LNG and the Russian government has also accepted that some of the 40–50 new Arc7 LNG carriers required for other planned LNG projects will be built abroad (Vedeneeva, 2020).

The room for international shipping companies in destination shipping is now less than expected some years ago. The key cargo owners in the Russian Arctic will to a large extent rely on their own shipping fleets to transport their cargo, as do Nornickel, Gazprom Neft, and Rosneft (through its subsidiary Rosnefteflot), and as Novatek is planning to do. Novatek set up a joint venture with Sovcomflot to own and operate 15 ice-breaking Arc7 LNG carriers for the upcoming Arctic LNG-2 in the Ob Bay. The carriers, to be built at Russia's new Zvezda Yard (near Vladivostok), will transport LNG from within the NSR to transhipment hubs in Murmansk or Kamchatka (Dyatel, 2019). Novatek also signed an agreement with Sovcomflot and China's COSCO Shipping and the Silk Road Fund to transport the LNG with regular carriers from the transhipment hubs to global markets (Novatek, 2019). Other extraction companies are also likely to enter into long-term contracts with designated foreign shipping companies. The rapid build-up of capacities at Russia's Zvezda Yard, where Rosneft is the key founder, is contingent on extensive cooperation with South Korean yards while non-Russian companies play an important role in the financing and operation of the new fleets of LNG carriers. The Zvezda Yard is seen as the key to the revival of Russia's shipbuilding industry and Rosneft is a staunch supporter of measures that can guarantee customers for the Yard.

A more troublesome development for international shipping is Rosatom's decision to establish its own container shipping company (Humpert, 2019), which would operate in competition with other users of the NSR, shipping cargos that could benefit from the advantages of the NSR, either directly or via transhipment hubs. Large investments in such a company will be a strong argument for shielding it from competition. In such a situation, Rosatom may become less interested in encouraging other users. As infrastructure operator, it would be able to effectively set the terms for international transits.

Conclusion

The developments discussed in this chapter indicate that Russia's policies for the NSR are becoming more inward-looking: current support for international use is not high on the agenda. Maritime infrastructure development along the NSR is being developed as a necessity to bring large quantities of energy and mineral resources from the Russian Arctic to the global market and support Russia's own domestic shipping and shipbuilding industry. Resource extraction companies in the Russian Arctic are building their own shipping fleets to bring commodities out of the remote areas.

Over the last ten years, international transits have been totally dominated by spot-market deliveries of commodities and transport of project cargo and for vessel repositioning between the Atlantic and Pacific markets, all reflecting short-term decisions by shipping companies and cargo owners rather than long-term strategies.

The Russian government has concluded that only when regular year-round navigation – serving resource extraction projects in the Russian Arctic – is established will the international shipping industry start to show real interest in the NSR. Russia is predicting that regular year-round transportation will be the norm on the NSR already during the second half of this decade. But even if the infrastructure materializes, a booming international transit business will not start automatically. Russia cannot decide the potential for international transit shipping; on the other hand, positive international market developments and reduced tensions will not help if supportive Russian policies and framework conditions are not in place.

Conditions for large-scale investments by the international shipping industry and cargo producers for use of the NSR are still not in place. Besides, there are uncertainties about Russia's longer-term policies. It remains an open question whether Russian preferences will support a de facto monopoly on Arctic transits rather than encourage competition from international shipping companies.

International shipping on the NSR has been dominated by European shipping companies with only a handful of Asian companies being involved each year. Transport of commodities from the NSR to European ports takes place much more frequently than to ports in the Asian Pacific region. Companies based in NW Europe have extensive experience of operating ice-strengthened cargo vessels in sea ice during the winter in the Baltic Sea, and some of these have been used on Arctic voyages during the summer-fall season. European companies also have extensive experience in the transport of heavy-lift cargos and in offshore support as well as in dredging operations in European coastal ports and rivers. This expertise and equipment have been in demand in the Russian Arctic and will likely continue to be so for several planned extraction projects.

A major limitation on the use of the NSR as an international shipping route has been the availability of ice-strengthened vessels of different segments and sizes for use on Arctic voyages. However, international shipping companies will not invest in expensive ice-class vessels only for spot-market deliveries of goods during parts of the year. They need confidence in stable framework conditions if they are going to undertake large investments in ice-strengthened vessels. International tensions and protectionism do not inspire confidence in stable conditions on the NSR. Some companies may be reluctant to engage in Arctic transport due to public concerns about perceived environmental risks. Yet Russia can claim that shorter sailing distances using the NSR translate into reduced emissions, and if enough LNG-powered vessels are introduced, climate-related arguments in favor of the NSR will be strengthened.

The last ten years have also highlighted the sensitivity of international transit shipping to conditions on the global commodity market and the freight market. The cost of chartering a vessel and the price of bunker fuel also influence

the choice of route. When freight rates and bunker prices are low, the economic advantage of using the NSR compared to southern routes can be quickly lost. Russia is relying on the Asian Pacific market to provide the highest future demand and prices for its commodities, justifying expensive infrastructure development along the more icebound eastern part of the NSR. If the price difference in commodities between the European and Asian markets is evened out, the rationale for sending such commodities eastwards through the Arctic to Asia disappears.

In the immediate future, however, the development path seems quite certain. Continued growth in destination shipping is connected to the development of resource extraction projects and transport of the output from these projects to foreign markets. The speed of development is likely to be affected by price developments in the international markets. Over the slightly longer term, many factors will play a role, as discussed in this chapter. The market outlook will be much affected by climate policies and the energy transition.

December 2021

Ex-post reflections

Even if a major conclusion in our study was that Russia's NSR policies had become more inward-looking, the economic underpinning of further expansion of navigation rests on integration with the outside world in two ways: for the provision of technology and investment in the huge extraction projects and the associated specialized transportation fleet, and as market for the products, mainly LNG and oil. A new international situation following the war in Ukraine as well as the economic sanctions imposed on Russia will have negative consequences for both, but exactly how much it is too early to tell. Already LNG development plans are being scaled back because of technology sanctions and the withdrawal of western companies. Possibly, western technologies can be replaced by domestic Russian or Chinese technology after some time, but investors will make new risk assessments. Big Asian importers of LNG and oil, notably China and India, will remain interested in Arctic oil and gas. Nevertheless, questions remain; for instance, will there be sanctions against companies transporting hydrocarbons from Russia? How comprehensive and effective will western efforts to deny Russia export revenue be? This again will depend on the political situation in Russia emerging in the aftermath of the war. The outlook for international cooperation in the development of the NSR looks very different today than when the study was concluded. All the same, the commercial experience from the use of the sea route, which is a major theme in this chapter, will also be relevant for future discussions about NSR in a new political environment.

April 13, 2022

Notes

1 The material presented in this section is partly based on Moe (2020a), Gunnarsson (2021), and Gunnarsson and Moe (2021). The traffic data was provided by Atomflot

(data for 2010–2012), the Northern Sea Route Administration (for 2013–2019), and the CHNL Information Office in Murmansk (for 2016–2019). Detailed descriptions of data sources, methodology, and definitions are to be found in these three journal articles.

2 The following definitions are important for the analysis: a *voyage on the NSR* is a voyage that originates from within the NSR, arrives in the NSR area, or transits the NSR. *International shipping on the NSR* is a voyage that departs from or arrives at a foreign (non-Russian) port and/or is conducted by a foreign shipping company. This includes *international transit voyages* between the Pacific and the Atlantic (between two foreign ports) and *destination voyages* between a Russian port and a foreign port. In both these cases, voyages can be made by either foreign or Russian companies. The third category comprises foreign companies involved in Russian *domestic shipping*.

3 The Russian Marine Register of Shipping (RMRS) ice classes are divided into non-Arctic, Arctic, and icebreaker classes. The ice-class notation is followed by a number denoting the level of ice strengthening: Ice1–3 for non-Arctic ships; Arc4–9 for Arctic ships, and Icebreaker 6–9 for icebreakers.

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