

Chinese Arctic Shipping Under the Polar Silk Road: Reality or Vision?

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Abstract This chapter discusses China's efforts to develop the Polar Silk Road (PSR) with an emphasis on the policy framework and relevant actors as well as China's polar maritime capacity, with a focus on shipbuilding. We contend that, in a period where few other available partners exist, China and Russia appear to be moving closer. However, this has not translated into accelerated PSR development. Moreover, China's engagement in the Arctic is based on its own interests and is not solely dependent on cooperation with Russia, as indicated in its Arctic White Paper. We argue that the lack of development of the PSR is partially due to China's preference for slow development rather than a hasty rollout given the Russian full-scale invasion of Ukraine and US strategic competition with China. Simultaneously, the PSR is a relatively ambiguous and marginal project for the Chinese political system, in terms of its development as an international cooperation project. The PSR is, however, mentioned in policy documents, which nevertheless indicate sustained government efforts. During past Sino-Russian negotiations, the PSR was considered pivotal for Russo-Chinese cooperation, but China is currently keeping a low profile in the PSR/Russian Arctic to avoid secondary sanctions from Western countries in the wake of Russia's war in Ukraine.

Abbreviations

Asian Infrastructure Investment Bank	AIIB
Belt and Road Initiative	BRI
China Ocean Shipping Company	COSCO
Ministry of Foreign Affairs	MFA
Northern Sea Route	NSR
Ministry of Natural Resources	MNR
Ministry of Science and Technology	MOST
Polar Silk Road	PSR
Silk Road Fund	SRF
State Oceanic Administration	SOA

Introduction

The Polar Silk Road (PSR, sometimes translated as Silk Road on Ice, bingshang sichouzhì lù, 冰上 丝绸之路) first appeared officially in a 2017 Russo-Chinese joint declaration in which the two countries agreed to develop the Northern Sea Route (NSR) (Joint Declaration, 2017; Yang, 2018; Yi, 2019; Woon, 2020). The 2017 announcement of cooperation on a PSR for shipping through the Arctic generated expectations of future large-scale Chinese investment in the NSR, highlighting the potential for resource extraction and maritime transport in the Arctic, as seen in Chinese academic articles and media reports (Woon, 2020; Moe & Stokke, 2019; Moe et al., 2023). The PSR is part of the Belt and Road Initiative (BRI), which was first announced in 2013, a global infrastructure initiative intended to “expand connectivity, economic integration, growth, and cooperation across the globe” (Gallagher et al., 2023, p. 5). Apprehensive at first, Russia formally declared its support for the BRI in 2015, but only as part of the docking of the BRI with Russia’s own Eurasian Economic Union (EAEU) (Ministry of Foreign Affairs, 2015).

The White Paper on China’s Arctic policy was issued in 2018, presenting a range of interest areas, from climate change, environmental protection, and shipping to resource development and governance (see State Council, 2018; Edstrøm et al., 2021). The Arctic is interesting to China from the perspective of (geo)economics, especially in relation to shipping in the Arctic and along the NSR. In the Arctic White Paper, China positioned itself geopolitically as a “near-Arctic state” and expressed a desire for “stronger international cooperation on infrastructure construction and operation of the Arctic routes” (State Council, 2018). China expressed an explicit interest in creating a PSR in cooperation with other countries (State Council, 2018). Like all BRI projects (Jones & Zeng, 2018), the PSR has been kept as a deliberately vague and loose umbrella term designed to accommodate diverse domestic and international contingencies. Simultaneously, because the utilisation of shipping routes in the Arctic is the core component of the project, our focus is on Chinese shipping in the Arctic, especially along the Northeast Passage, as the main economic driver behind the PSR.

In this chapter, we contend that the PSR strategy is still in its infancy. At the present stage, it is a low-risk and low-investment project, but it has the potential for growth as China and Russia grow increasingly closer. We present and analyse China’s efforts and preparedness to develop the PSR, with emphasis on two important aspects: 1) the policy framework and relevant domestic economic actors, and 2) China’s polar maritime capacity, with a special focus on China’s shipbuilding capacity. We have chosen these two aspects because even though China has shown a willingness to invest in projects not immediately or easily profitable, the BRI requires the support of China’s domestic actors, as financing these projects constrains China’s own growth (Liang, 2020) and there is ever-increasing focus on financial viability of BRI projects (Bulman, 2023). Furthermore, how well positioned China’s shipbuilding and shipping industry is for polar shipping offers insight into the likely amount of future Chinese traffic along the PSR. Moreover, PSR development must be seen in the context of the geopolitical situation of the past couple of years. As discussed in Chapter 5, the Arctic region, historically described as an exceptional area of low tensions and international cooperation, has recently re-emerged as an arena for great power politics between the United States and Russia, and, increasingly, China. The relations between China and Russia in the Arctic are also relevant

to any discussion of the PSR. Currently, the closer relationship has not translated into accelerated PSR development, and we raise a few questions regarding the causes. Furthermore, the heightened security profile of international relations in the Arctic has been intensified by events outside the Arctic region, such as Russia's invasion of Ukraine and China's reluctance to condemn it or sever ties with Russia. China's growing military and commercial capabilities as a maritime power, as well as the country's efforts to secure China's presence and influence in the Arctic, have inevitably become a subject of scrutiny in the West.

The data presented in this chapter consist of primary sources, including publicly available Chinese State Council and ministerial documents, reports by Chinese state media, and information from state-owned enterprises, such as China Ocean Shipping Company (COSCO), and shipbuilding orderbooks. We have relied on similar sources in English and Russian. This information is also supported by evidence we gathered from before 2017, which demonstrates shipping was indeed a core interest for China in the Arctic.

PSR and Sino-Russian Cooperation in the Arctic

Although the agreement that Russia and China should cooperate in polar shipping was born out of Sino-Russian bilateral negotiations in 2017 (Alexeeva & Lasserre, 2018), the understanding of what this cooperation would entail differed between the two countries. For China, the PSR is "an important cooperation initiative" to "facilitate connectivity and sustainable economic and social development of the Arctic... encouraging joint efforts to build a blue economic passage linking China and Europe via the Arctic Ocean, enhancing Arctic digital connectivity, and building a global infrastructure network" (State Council, 2018). The announcement of the PSR in 2017 was translated merely as the joint development of the NSR into Russian (Anon, 2017b) and Russia expected large-scale Chinese investment in the NSR (Tillman et al., 2018). This was further entrenched by Russia's and, at times, China's continued emphasis on its bilateral nature: "the two sides will jointly develop and use maritime routes, especially the Arctic Route, to create the 'PSR'" (Xia & Xie, 2018).

Yet, this was not to be a Russian project, as Chinese authorities wanted their vision of a PSR to be a Chinese initiative and not an add-on/appendix to Russian plans (Moe et al., 2023). Although China realised that Russia must play a key role in any development of trans-Arctic shipping for the foreseeable future, China's Arctic White Paper strongly stressed international cooperation in developing Arctic shipping routes without specifically mentioning Russia. The White Paper explicitly stated, "China hopes to work with all parties to build a 'Polar Silk Road' (PSR) through developing the Arctic shipping routes." There were clearly different perceptions between Russia and China: Putin talked about "the possibility of connecting" the NSR "with the Chinese Maritime Silk Road" (Kremlin, 2019), not about the NSR being a segment of the PSR, which is the common interpretation of the PSR in China (Moe et al., 2023; Alexeeva & Lasserre, 2018). In the Chinese and international media, the PSR quickly became a recurrent theme (Qiang et al., 2020). Official Chinese statements also highlighted the concept (Gao, 2019), and always underlined that this was a Russian initiative. China's Foreign Minister Wang Yi said, "China welcomes and supports the 'Polar Silk Road' initiative proposed by Russia and is willing to work with Russia and other parties to jointly develop the Arctic route" (FMPRC, 2017). It was indeed Russia's Deputy Prime Minister Rogozin who first broached the subject

of the “cold silk road” with China in 2015 (Woon, 2020), but the term PSR was mentioned by President Xi himself in July 2017 (Central People’s Government, 2017). On 4 February 2022, China and Russia issued a joint statement, *International Relations Entering a New Era and the Global Sustainable Development*, in which China for the first time hesitantly supported Russian anti-NATO rhetoric. Concerning the Arctic, “the two sides agreed to continue consistently intensifying practical cooperation for the sustainable development of the Arctic.”

Fast forward to today, and we see that the PSR through the Russian Arctic has not met this level of ambition for numerous reasons (Moe et al., 2023). There are several aspects to consider. First, Sino–Russian cooperation following expectations in maritime infrastructure on the Northern Sea Route has not yet materialised. This may be because “different norms of global governance have the potential to slow down, if not derail, long-term cooperation between the two countries” and the PSR developed into a “framework for Chinese visions of greater connectivity as well as economic development in the Arctic with China seeking endorsement for the ideas emanating from Arctic countries other than Russia” (Moe et al., 2023, pp. 12, 21). China also emphasises the economic significance of transit shipping on the NSR and the Polar Silk Road for its own economy. Moreover, we argue that the lack of development of the PSR is partially due to China’s preference for slow development, rather than a hasty rollout, given the current geopolitical circumstances. Russia’s invasion in Ukraine has made China more cautious in its approach to cooperation with Russia in the Arctic for fear of secondary sanctions (Heggelund & Stensdal, 2024).

Aside from research, Chinese activities in the Arctic have been most prominent in the areas of direct interest to the PSR: energy and shipping. In fact, energy has been one of the key motivations for action. Against the backdrop of Russo-Chinese energy cooperation, China’s need to ensure its energy security has often been cited as a reason for China’s Arctic engagement (Lu & Zhang, 2016). Domestically, China introduced an energy revolution in 2013, which promoted a shift in energy structure with a clear emphasis on electricity, natural gas and cleaner, high-efficiency, and digital technologies (Heggelund, 2021). China’s Arctic White Paper encouraged Chinese enterprises “to participate in the infrastructure construction for these routes and conduct commercial trial voyages in accordance with the law to pave the way for their commercial and regularised operation” (State Council, 2018). In 2013, the China National Petroleum Corporation (CNPC) purchased a 20% stake in the Yamal LNG project, signalling China’s growing interest in the Arctic region’s energy resources. Subsequently, in 2015, the Chinese Silk Road Fund acquired a 9.9% share from Novatek, further reinforcing China’s commitment to the project, following Russia’s support of the BRI. Building on the existing cooperation, in 2019, two Chinese enterprises—China National Offshore Oil Corporation (CNOOC) and the subsidiary of CNPC, China National Oil and Gas Exploration (CNOCD)—each secured a 10% interest in the second phase of the Arctic LNG-2 (Henderson & Moe, 2019, pp. 138-141). This activity exemplifies China’s strategic investments in Arctic resource extraction projects, particularly through collaborative ventures with Russia in the Yamal-Nenets region, where LNG production commenced in 2017. Moreover, China invested in 14 out of a total of 15 tankers that transport LNG from Yamal (Staalesen, 2019). Following sanctions in response Russia’s war on Ukraine, Chinese companies were contracted to construct 26 modules for Arctic LNG-2, with the largest of the contracts exceeding RMB 6 billion (Humpert, 2024). Although energy cooperation between China and Russia is still ongoing, the

power balance between the two may have shifted since Russia's full-scale invasion of Ukraine in 2022. China is now in a stronger position than Russia, due to its increasing isolation, and potentially has bargaining leverage on energy projects (such as Power of Siberia 2, Wong, 2023). This has resulted in Russia's growing reliance on China for both economic and political cooperation (Heggelund & Stensdal, 2024).

The Polar Silk Road: Key Actors and Policy Documents

The PSR project has no formal oversight agency. As a result, the PSR management and decision-making process is fragmented between many actors. It appears that the Chinese Communist Party (CCP) has strengthened its authority and taken over the responsibility that was previously delegated to the State Council and its ministries in the Xi Jinping era (Mitchell, 2016). Still, except for questions of the highest national interest, decision making in China involves bargaining to obtain consensus between the interests of provinces and the central government, different industries and ministries, and perhaps even individuals (Li, 2017). When analysing Chinese foreign policy, it is customary to look at central government actors, namely, the CCP, the State Council and its ministries, and the People's Liberation Army (PLA). This list can be further supplemented by state-owned enterprises (SOEs), subnational governments, academia, media, and netizens (Jakobson & Knox, 2010), many of which participate in the formation of Arctic policy (Kossa, 2020). While decisions are primarily made by the central government and party officials, the process is characterised by input from different ministries. The expanded scope of China's foreign relations, particularly in regions such as the Arctic, necessitates input from entities with specialised knowledge. China's scientific research in the Arctic has therefore become a competitive tool for asserting potential national interests (Eiterjord, 2024).

China's Arctic White Paper was formed by the central government in collaboration with sub-state and non-traditional foreign policy actors such as academia (Kossa, 2020). Central state actors, such as the foreign ministry, signal the need for policy proposals, for example, through formulation of new concepts or slogans, such as the Belt and Road Initiative (Zeng, 2020), allowing sub-state and non-state actors to interpret the foreign political agenda. At the same time, the ultimate decision-making power rests with the Party leadership through the CCP Politburo. This thesis is supported by the argument that China's politics is one of "fragmented authoritarianism" (Lieberthal, 1989; Heilmann, 2008; Mertha, 2009). The fact that the PSR was designed to satisfy several competing interests at its inception demonstrates that it was designed by several actors.

At the state level, it is the constituent departments of the State Council that are most relevant to the PSR. In 2011, the State Council established an intra-ministerial mechanism for Arctic affairs consisting of 19 ministries and administrations (Xu, 2017). The Ministry of Foreign Affairs (MFA) was the leading ministry with an overarching policy coordination function and oversaw the drafting of the 2018 China's Arctic policy White Paper. In June 2017, the National Development and Reform Commission and the State Oceanic Administration (SOA) released the Belt and Road Initiative Maritime Cooperation Plan, initially describing the "Arctic Passage" as a new dimension of the BRI, a "Silk Road on Ice". In 2018, the Ministry of Natural Resources (MNR) was strengthened and given portfolios from SOA, thus becoming

the key ministry for Arctic affairs. MNR proposes policies and plans and oversees overall Arctic activities. Finally, the Ministry of Transport (MoT) is responsible for road, water, and air transportation, and has expressed interest in potential shipping lanes in the Arctic. Several agencies under the MoT, such as the China Maritime Safety Administration, are actively involved in regulative work on the PSR. In addition, provinces are important stakeholders with their own interests and agendas (see Table 1).

In addition to formal state institutions, one would expect the Asian Infrastructure Investment Bank (AIIB) and the Silk Road Fund (SRF), the two major financial institutions behind the BRI, to play key roles in funding the PSR. With a base capital of US\$100 billion, the AIIB is a multilateral bank that was established in 2014 and actively supported the “Silk Road economic belt” and “21st century maritime Silk Road” initiatives that make up the BRI (Callaghan & Hubbard, 2016; Dollar, 2015). However, it has not been involved in funding the PSR initiative (Jiang, 2019). The much smaller US\$40 billion Silk Road Fund has only played a marginal role by purchasing a minor 9.9% stake in the Yamal LNG project in 2016 (NOVATEK, 2016a), but has not participated in contributing to the PSR project after its announcement a year later. The Export-Import Bank of China and the China Development Bank gave lines of credit to both the Yamal LNG and Arctic LNG projects (NOVATEK, 2016b; NOVATEK, 2021a).

One of the key actors in the PSR is COSCO, a state-owned enterprise that provides a variety of maritime services, including container shipping, dry bulk shipping, and liquid bulk shipping. As one of the largest shipping companies in the world, COSCO is responsible for transporting goods and materials along BRI routes, including the PSR. For example, COSCO’s Tian En vessel, one of COSCO’s three 36,000 t ice-class multipurpose ships built in 2017 and capable of navigating through 0.8 m of first-year ice, transported large wind power equipment from Lianyungang Port to Europe, saving 12 days by travelling via the Northeast Passage rather than the traditional Suez Canal route (Central People’s Government, 2020).

In addition to ministries and bureaucracy, research institutes and universities associated with polar research have contributed their opinions through reports and articles and have thus had the opportunity to influence China’s Arctic policy and the PSR. Chinese scholars had proposed the idea of a Northern Silk Road for over a decade but only as an envisaged sailing route—not as an initiative connected to Chinese investments (Moe et al., 2023). While there are also official channels established between research institutions, think tanks, and authorities for input into policy design based on research projects, it is difficult to say how much they influenced the conceptual development of the PSR.

Analysis of Chinese Policy Documents on the PSR

Official Chinese documents provide unique insights into Chinese activities in Arctic transportation. There is no single policy document outlining the PSR. Indeed, the PSR enjoys a relatively marginal position in several key policy documents, such as the national and sectoral five-year plans, plans for the development of science and technology, and key policy initiatives (see Table 1). Yet, the fact that they are mentioned indicates continued policy attention. The following subsection will briefly discuss the main state policies and their implications for the PSR.

The idea of creating a “blue economic passage... leading up to Europe via the Arctic Ocean” was for the first time announced in the Vision for Maritime Cooperation under the BRI released in 2017, where the Chinese government aimed to support Arctic countries in “improving marine transportation conditions,” encouraged “Chinese enterprises to take part in the commercial use of the Arctic route,” and sought to collaborate on the sustainable exploration of Arctic resources (State Council, 2017). This desire was confirmed a year later in China’s Arctic White Paper, where the country explicitly expressed a desire to work with other parties to construct a PSR to “facilitate connectivity and sustainable economic and social development of the Arctic” (State Council, 2018).

These proposals to construct the PSR were consistent with China’s overall foreign political priorities of promoting economic growth through foreign trade and investment, addressing global governance issues, and enhancing its global influence. The Arctic came to be categorised as an “important maritime interest” and a “strategic new frontier” (Andersson, 2021), both of which were identified as areas where China could provide global leadership. In 2019, the State Council released its proposals for the construction of a “transportation great power”, where the “independent design and construction capabilities” of “polar navigation ships” was identified as a policy priority (State Council, 2019).

Likewise, the PSR is part of the construction of “maritime great power” and the further development of the marine economy, which are considered important in the further economic growth of China. Economic development has been a pillar of state stability and legitimacy for the CCP’s monopoly on power. Recent years have seen a considerable slowdown of GDP growth in the Chinese economy, and hence the emphasis has shifted towards so-called “high-quality development”. The concept of high-quality development was first introduced during the 19th Congress of the Communist Party of China in 2017, when it became clear that the existing “high-speed growth” mode of economic development was no longer capable of producing consistent economic growth (Jin, 2018). High-quality development is tasked with simultaneously solving the problem of economic slowdown and dealing with environmental and climate crises. In addition, after the trade war with the United States, high-quality development became associated with reducing China’s reliance on external trade partners, with a larger focus on the internal market (Quan, 2018). China’s “dual-circulation” strategy, put forward in 2020, is an example of a policy to reinforce its own market (the “great domestic circulation”) and to fully support domestic supply chains as a matter of national security. At the same time, it envisioned that China would remain open to the world (the “great international circulation”) (The Economist, 2020; Kwan, 2021).

The potential importance of the PSR for China’s further economic growth was affirmed by its inclusion in the 14th Five-Year Plan, which is the key economic policy document that sets priorities for the country’s economic development until 2025 and the general direction for economic development until 2035. By including Arctic shipping and the PSR in the 14th Five-Year Plan, the state indicated that there is continued funding for the project, at least until 2025. Further, the 14th Five-Year Plan mentions cooperation in the polar regions under the category of Actively Expanding the Space for Development of Marine Economy. The document calls for China to “deepen its participation in global maritime governance” and to “participate in issue-specific Arctic cooperation and construction of the Polar Silk Road” (State Council, 2021). Thus, the 14th Five-Year Plan recognises PSR and Arctic cooperation under China’s maritime

development, with enhancement of the country’s maritime power as the ultimate goal. The Arctic is just one of many domains in which the plan identifies “participation in global marine governance” as desirable, along with international maritime law, marine environmental protection, marine scientific research, search and rescue, deep-sea resource exploration, and the “Antarctic conservation and utilization”.

Implementation of these three policy priorities requires the modernisation and technological development of Chinese fleets and supporting infrastructure such as navigation satellites and shipbuilding capacity. Support for such research and development was specifically included in sectoral plans, such as the National Maritime Science and Technology Development Plan, which identified several “polar rights protection” technologies, including technologies for the extreme polar environment, specifically polar environmental and resource observation and detection technologies, and low-temperature endurance and long-term observation systems for harsh polar conditions (State Oceanic Administration, 2016).

Similar goals were formulated in the 13th Five-Year Plan on Scientific and Technological Innovation in the Marine Field jointly issued in 2017 by the Ministry of Science and Technology (MOST), Ministry of Land and Resources, and Ministry of Water Resources, which identified, as one of its seven major tasks, “improving China’s polar scientific research ability and technical support capacity and providing technical support for the protection of China’s polar rights and interests” (MOST et al., 2017).

One of China’s main goals is to reduce technological reliance on other countries in core areas, including polar technologies. This is part of several government initiatives, such as “Made in China 2025” (launched 2015), which seeks to reduce China’s technological reliance on Western technology in the manufacturing sector (Quan, 2018). To enhance its status as a “transportation great power,” China emphasises elevating “scientific and technological innovation to a core position, striving to achieve high-level scientific and technological self-reliance,” especially in emerging domains, such as polar regions (Ministry of Transport, 2021b). In the area of shipbuilding, emphasis is on “new and clean energy ships, smart ships, medium and large cruise ships, polar ships” (Ministry of Transport, 2021). In a similar manner, provincial plans emphasise the importance of self-reliance and improvement in the ship and marine engineering equipment industry to “protect rights in the polar regions” and to construct a “maritime great power” (Shandong Province, 2022).

In conclusion, technological modernisation is an important prerequisite for Chinese shipping in the Arctic. The development of polar shipping is seen by the Chinese government as a new sphere of technological and scientific transformation, which is considered an integral part of strategic technological competition with the United States. Simultaneously, China emphasises that the construction of this “transportation great power” rests on principles of cooperation and increasing global interconnectedness.

Table 1. Key policy documents

Year	Document name	Name in Chinese	Agency
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2017	Vision for Maritime Cooperation under the Belt and Road Initiative	“一带一路”建设海上合作设想	National Development and Reform Commission; State Oceanic Administration
2018	China's Arctic Policy White Paper	《中国的北极政策》白皮书	State Council Information Office of the People's Republic of China
2019	Outline on Construction of a Transportation Great Power	交通强国建设纲要	State Council
2021	The 14th Five-Year Plan for Economic and Social Development and Long-range Objectives through the Year 2035 of the People's Republic of China	中华人民共和国国民经济和社会发展 第十四个五年规划和 2035 年远景目标纲要	National Development and Reform Commission
2021	Marine Economy Development Plan under the 14th Five-year Plan	“十四五”海洋经济发展规划	National Development and Reform Commission; Ministry of Natural Resources

China's Shipping: Capacity and Shipbuilding

The PSR has traditionally been understood as a “blue economic corridor connecting China with Europe via the Arctic Ocean” where China seeks to achieve mid- to long-term results (Zhao, 2018, p. 91), where “Russia's Northern Sea Route plays the role of a road rather than a destination” (Jiang, 2019, p. 70). At the time of its announcement, the PSR referred to bringing China's utilisation of the Arctic shipping routes, especially the NSR, under the existing BRI umbrella. China anticipated several key advantages, including reduced shipping distances to Europe from its northern ports, enhanced “access to abundant energy resources along the open waterway and opportunities for economic and trade cooperation with countries along the route,” and developmental opportunities for ports in Northern China (Anon, 2017a). Since the launch of the PSR, Chinese ships have gradually increased sailing on the NSR (see Figure 1).

During the period from 2013 to 2021, the Chinese state-owned enterprise COSCO completed 56 voyages along the Northeast Passage using 26 ships. For all 56 voyages conducted by COSCO, only 11% had Russian ports as destinations on the western end of the voyage (see Figure 2), compared to Finland at 23% Sweden at 14%, and Germany at 14%. The low percentage of COSCO voyages ending in Russian ports suggests that the NSR is used primarily as a transit corridor to the more commercially viable EU market, rather than as a destination. This highlights China's focus on reducing reliance on congested traditional sea routes and avoiding geopolitical risks while enhancing trade efficiency with key EU trading

partners. This emphasis on the EU markets is in line with the opinion of COSCO's Deputy General Manager Yu Zenggang that "The Arctic Northeast Passage expands China's foreign trade maritime service routes and provides... Asian and European customers... more choices in terms of trade channels. Merchant ships bound for Europe will not have to wait in the busy Suez Canal, and they will also be able to avoid sensitive areas on traditional routes" (quoted in Liu, 2017, p. 41). Thus, COSCO sees connecting the EU and Chinese markets together as its main objective under the aegis of the PSR.

Figure 1. Number of Chinese-owned ships with permits for sailing in the waters of the Northern Sea Route. Source: Author compilation based on data from NSR Administration (2023)

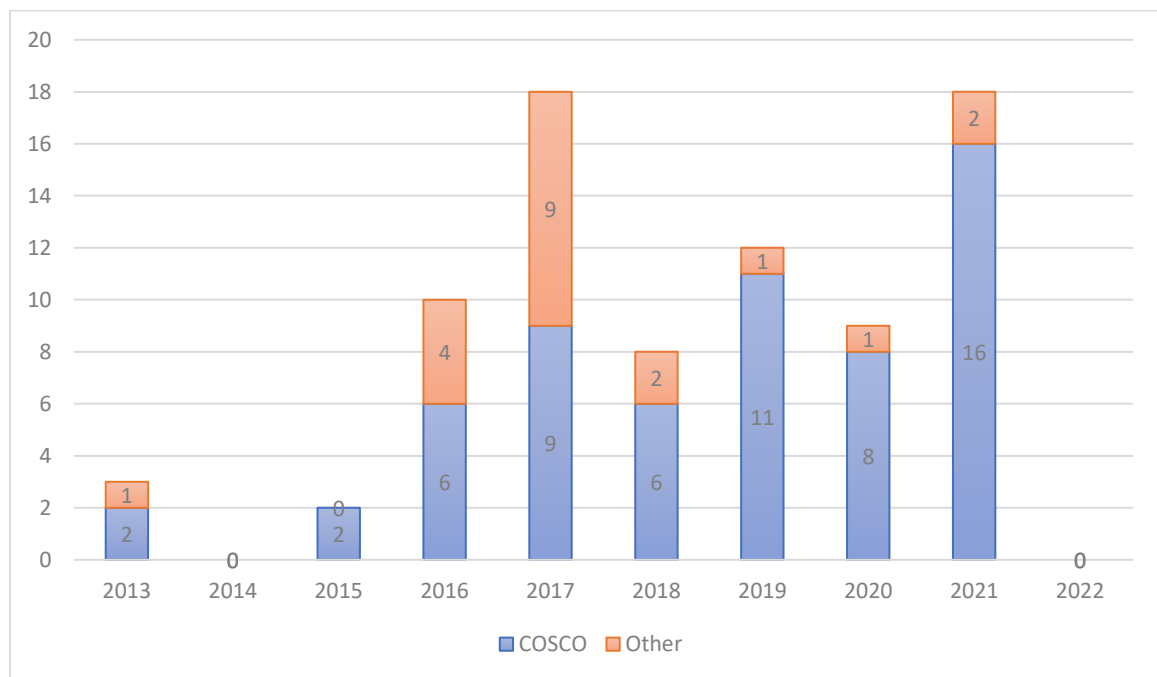
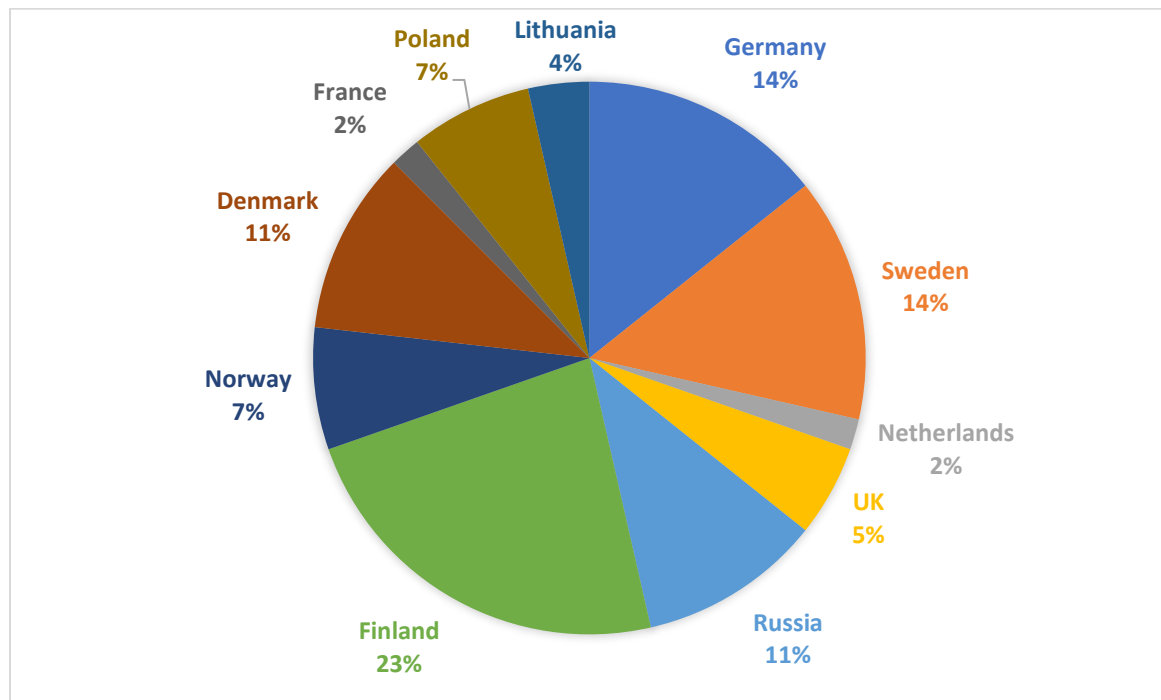


Figure 2. COSCO voyages (2013-2021) by country of destination port. Source: Author compilation based on data from Chen (2023)



China's development of the PSR is thus closely related to its capacity to travel in the Arctic. COSCO actively invested in the construction of ice-going vessels, for example, the Tian-class (天) ships with Chinese Classification Society Ice Class B1, which ensured that the ships could safely navigate in first-year sea ice-covered waters. The choice of ice-going vessels that are capable of withstanding ice, while lacking actual ice-breaking capabilities, is economic, as these vessels, unlike icebreakers, are not significantly more expensive in terms of construction or exploitation (Solakivi et al., 2019), but have a wider geographical scope for sailing.

In practice, however, destination shipping generated more traffic on the NSR than transit or cabotage (Gunnarsson & Moe, 2021). China's transit shipping in the Arctic experienced certain technological "bottlenecks" (卡脖子) (Han et al., 2023), including lack of a navigation system, limited navigable period, floating ice, and lack of infrastructure, especially in search and rescue (Lin, 2021). Although addressing many of these issues requires cooperation with coastal states, particularly Russia, China's various agencies have been actively engaged in unilaterally resolving these issues.

First, China's Maritime Safety Administration published Arctic Navigation Guides both for the Northeast and Northwest Passages in 2014 and updated the one for the Northeast Passage in 2021, providing information on safe navigation on these routes. In addition, the Ministry of Transport prepared the Arctic Northeast Passage Communications Guide (2017). Despite these steps, deficiencies in nautical publications and sparse depth data on some charts remain, including outdated and insufficiently detailed maps (Han et al., 2023; Ding et al., 2017).

Second, China is reliant on foreign remote sensing capabilities. In 2016, only the Global Positioning System (GPS) met navigation requirements with 8-10 synchronous observation

satellites, while China's Beidou was at 0-3 satellites (Ding et al., 2017). This provided China with an incentive to develop its own satellite capabilities to map and monitor the polar regions, particularly in the Arctic, as ground-based infrastructure is still limited. The first satellite in this endeavour was the Ice Pathfinder, put into orbit in September 2019, which is part of China's "tripolar observation satellite constellation," a planned network of 24 satellites that should be operational by 2030 (Bennett & Eiterjord, 2022).

Third, China has experienced unreliable coast-based communications along the Russian coast due to the geomagnetic environment of the Arctic region (Han et al., 2023; Ding et al., 2017). In addition, Inmarsat, which provides global mobile satellite communication, loses signal at 75°N. The reliability of Inmarsat services is particularly crucial in emergency situations but also for ship-to-shore communication, such as information for navigation, weather updates, and operational coordination. As a result, China's Beidou successfully applied to become a Global Maritime Disaster and Safety System (GMDSS) provider and was recognised by the International Maritime Organization (IMO) in November 2022 (Han et al., 2023), potentially providing a future solution to the problem of communications.

Finally, China has moved to improve its search and rescue capabilities in the Northeast Passage. The Ministry of Transportation's Rescue and Salvage Bureau is conducting a 1-2 year pilot mission to "research emergency rescue capacity-building and implementation path for the 'Polar Silk Road,'" including the design of heavy-duty ice-breaking rescue ships suitable for the Arctic. This initiative aims to advance emergency rescue capabilities along the PSR, with the Ministry of Transport's references to icebreaker rescue ships (破冰救助船) highlighting the significance of these specialised vessels in China's efforts to facilitate safe and efficient navigation in challenging Arctic waters.

Despite these efforts, China has realised the need to invest in shipbuilding capabilities to achieve reliable navigation in the Arctic. This strategic approach involves investing in Chinese shipyards and research institutions, including the construction of ice basins and other specialised infrastructure to facilitate the development of ice-going ships.

Construction of China's own ice testing facilities, which is a crucial step in the process of designing safe and efficient vessels for operation in polar regions or other ice-covered areas, provides one such strategic outlet, reducing China's previous reliance on Russia's Krylov State Research Institute and Finland's Aker Arctic for these tests (Eiterjord, 2020). In February 2023, following five years of design, the China Shipbuilding Industry Corporation's Ninth Research Institute (中国船舶集团所属中船九院) begun construction of a large ice test basin in Wuxi (Wuxi City Binghu District People's Government, 2023). Once completed, this project will bolster China's research in polar ships and marine engineering, reinforcing China's self-sufficiency in acquiring key marine technologies, and contributing to the "strategy of becoming a 'maritime great power'" in "deep sea, polar, green, intelligent, autonomous and controllable" technologies (Anon, 2023a).

Chinese shipyards have also showcased their technical prowess by constructing ice-class ships and icebreakers. In addition to the aforementioned Tian-class vessels, Chinese shipyards delivered five 68 DWT Green-class vessels with 1C ice-class for operation from the Baltic Sea in 2023, meant for travel between Finland and China (Anon, 2023b). China's growing polar shipbuilding capacities are evident from acquisition of another domestically

designed and constructed icebreaking research vessel *Ji Di* (IMO 9970351) launched in 2024 and a Polar Class 4 deep sea scientific research vessel tentatively named *Tan Suo San Hao* (CGTN, 2023; Wang, 2024). This new additions to the fleet would be a testament to China's evolving capacity for building ships designed for harsh, icy conditions. Such investments also include those in research infrastructure, communication technology, and other polar technology. Chinese shipyards and research institutions have already built ice basins and other infrastructure to develop ice-going ships, including nuclear-powered icebreakers.

Conclusion: What Does the Polar Silk Road Tell Us About Chinese-Russian Relations?

The chapter describes China's efforts to develop the PSR, with emphasis on two important aspects: the policy framework and relevant actors, and China's polar maritime capacity, with a special focus on its shipbuilding capacity. We conclude that the PSR is a long-term strategic investment that calls for gradual development. Simultaneously, the PSR is a relatively ambiguous and marginal project for the Chinese political system. First, there is ambiguity regarding its scope and explicit plans for its development. In particular, China envisaged the PSR as a focal point of Sino-Russian bilateral cooperation in the Arctic but, ultimately, as a cooperation project that was not limited to cooperation with Russia. This is evident from China's shipping interests in the Arctic, which see connecting EU markets with China as their primary objective. Second, the content of the PSR remains vague, as the project does not have a supervising agency and is not financed with the help of traditional BRI institutions. Third, to achieve reliable navigation in the Arctic, China must still develop marine capacity and invest in its shipping capabilities.

Regarding China and Russia relations, the two countries have expressed a shared vision for the world order in joint statements (such as in February 2022), but Russia's war in Ukraine has impacted bilateral Arctic cooperation, including the PSR. China's engagement in the Arctic is founded on its own interests and is not solely dependent upon cooperation with Russia, as indicated in its Arctic policy White Paper. As China is in a stronger bargaining position due to Russia's isolation, it is being prudent in dealing with Russia in the Arctic, including on the PSR. In Sino-Russian negotiations, the PSR was considered a new focus for Russo-Chinese cooperation, yet China is currently maintaining a low profile in the PSR/Russian Arctic to avoid secondary sanctions from Western countries. Although the development of transport corridors remains on the agenda for China, slow and steady development appears to be its tactic under current conditions. The lack of development of the PSR is partially due to China's preference for slow development, rather than a hasty roll-out, given the current geopolitical circumstances.

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