

Arctic Blue Economic Corridor: China's Role in the Development of a New Connectivity Paradigm in the North

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During recent years, growing exploration of natural resources and development of transport routes have reemerged in the Arctic as a scene for political and economic collaboration between Nordic and non-regional states. Being a non-Arctic country, China nevertheless has played an active role in the elaboration of international regulations and the establishment of governance mechanisms in the Arctic. The country has recently released a White Paper on the Arctic Policy and thus prioritized scientific research, underscored the importance of environmental protection, rational utilization, law-based governance, and international cooperation, and committed itself to maintaining a peaceful, secure and stable Arctic order. Diversified transportation routes and economic corridors are of paramount importance to such global trading nations as China. However, an extension of the economic corridors to the Arctic is viable only in the case of development of satellite trade, production, and research opportunities along the potential transport routes. In this study, the authors discuss the critical points in the implementation of China's paradigm of collaboration and connectivity in the Arctic, as well as focus on the promotion of bilateral win-to-win investment and trade projects with the countries along the potential Arctic Blue Economic Corridor (ABEC). The authors conclude that the ABEC may be efficiently incorporated into China's Belt and Road network, but emphasize that specific technological and economic challenges have to be considered and met before a sustainable connectivity between the markets of Asia and Europe is established in the Arctic.

Introduction

International collaboration in the Arctic and the challenges of Arctic connectivity for economic development and trade have been attracting increased attention by many scholars worldwide. One of the most comprehensive comparative studies of Arctic strategies and policies of different countries has been made by Heininen (2012), who summarized the priorities, priority areas, and objectives of major actors in the Arctic. Involvement of non-Arctic states into the Arctic governance and growing roles of China, Japan, Republic of Korea, and other non-regional actors

in the Arctic issues has been studied by Ivanov (2016), Coates and Holroyd (2017), Lanteigne (2014), Leifer (2013), Peng and Wegge (2015), Streltsov (2017), and others. Most of the publications include contemporary issues of international cooperation in the Arctic in the formats of the Arctic Council and the Nordic Council. However, it is important to consider the roles of various trans-Arctic interactions between Nordic and non-Arctic countries, particularly, China, to address the specific implementations of China's Belt and Road Initiative (BRI) and China-Nordic diplomatic model for achieving sustainable development in the region.

The themes of China's involvement in the Arctic governance and growing role of the country in the Arctic issues have been addressed by both Chinese and international scholars. Lanteigne (2014) studied the evolution of China's Arctic strategies in terms of their distinct paths, institutions, and political and economic dimensions. Joelsen (2016) focused on the study of China's engagement with the Arctic Council, particularly, strategic goals of China's observer status in that organization, principal interests of the country in the Arctic, and peculiarities of contemporary China's diplomacy with the Arctic countries. Lanteigne (2017), Stokke (2013), and Gavrilov and Kripakova (2017) determined the prerequisites for the formation, analysis of the current state and of the future development of the Arctic policy of China and the countries of Northeast Asia and provided a description of current opportunities for China to participate in the institutional and rule-making mechanisms of the Arctic governance.

Bennett (2014), Stephenson et al. (2013) paid special attention to the ports linking resources in the North Pacific and wider Arctic region to destinations in Northeast Asia, particularly, the effects of the development of the shipping lanes in the Arctic Ocean for the increase of commercial ties between Asia and Nordic countries. Special attention has been given to the investigation of transport corridors in the Arctic. Meng et al. (2017) focused on navigation conditions and commercial features and reviewed the existing studies that had examined the necessary conditions and requirements for transarctic shipping routes to be viable. Guy and Lasserre (2016) studied perspectives, challenges, and regulations of commercial shipping in the Arctic. Jorgensen-Dahl (2010) investigated the perspectives of economic development and shipping in the Arctic along the Northwest, Northeast, and Transpolar passages. Farre et al. (2014) focused on the perspectives and challenges of commercial Arctic shipping through the Northeast Passage, including Russia's part of the Northern Sea Route (NSR). Ruksha et al. (2013), Xu et al. (2011), and Verny and Grigentin (2009) studied the perspectives and challenges of development and exploration of the NSR for bulk and container shipments between China, Russia, and Europe. Dunlap (2002) studied the possibilities of transit transportation along the NSR by Russian and foreign vessels. Kikkas (2015) and Zalyvsky (2015) discussed the potential of the NSR and other transport corridors in the Arctic and conducted an analysis of major factors affecting the performance of transport and economic projects in the High North. Fisenko (2013, 2014) and Zelentsov (2012) focused on the political, economic, and transport aspects of the development of the NSR in terms of competition for resources in the Arctic and search of new ways of shipping.

China has recently published its Arctic policy and incorporated the Arctic shipping lanes into the BRI transport network. Contemporary approaches of the country to the development of the region and exploration of its resource and transport potential require thorough study in the light of the collaboration with Nordic countries. However, as to the involvement of the Nordic countries in the implementation of the announced Arctic Blue Economic Corridor (ABEC)

initiative, there have not been any comprehensive studies of the issue so far. Perspectives on the development and commercial use of transport and trade routes in the Arctic, polar logistics, and development of infrastructure in the High North are among the hot topics to investigate. This paper attempts to bridge the gap and assesses the challenges and perspectives of turning the ABEC into an economic and transport corridor between China and Europe. This study discusses the major challenges China faces in exploring new maritime ways in the Arctic and collaborating with Nordic countries and Russia in the development of the ABEC.

China's Arctic Aspirations

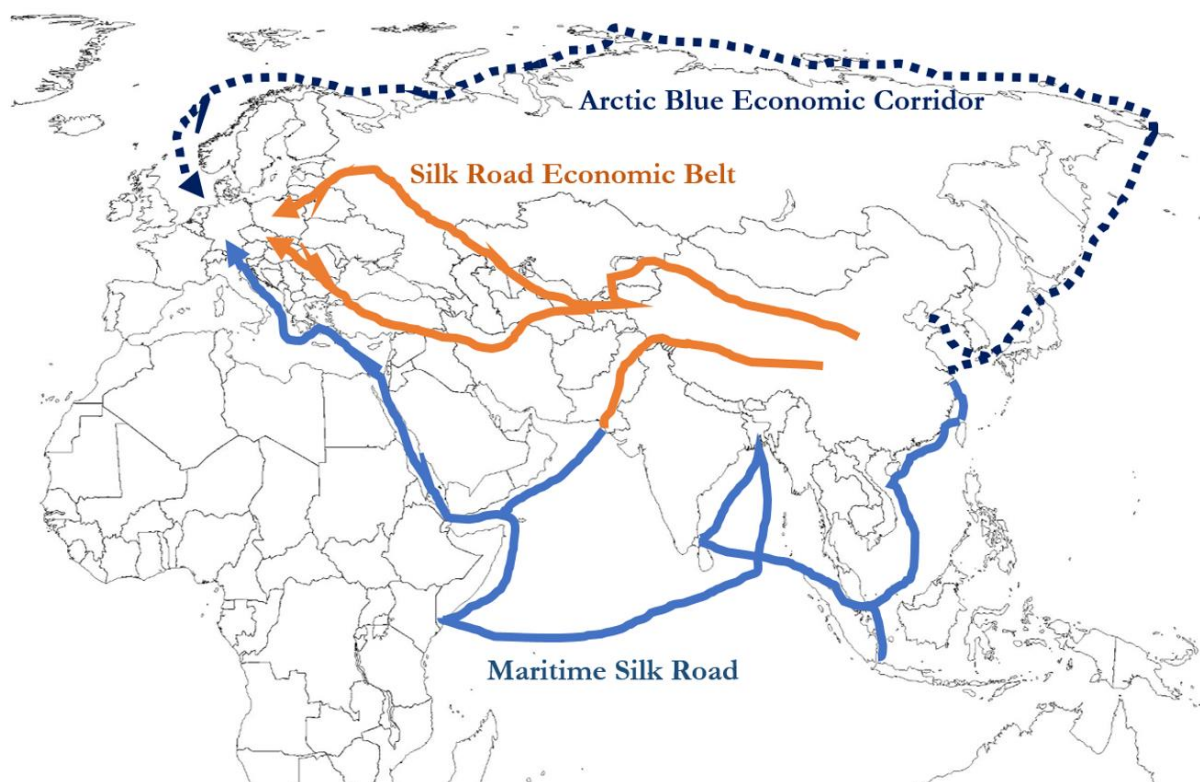
In recent decades, international northern cooperation between the Nordic and non-Arctic states has become more institutionalized and dynamic. Various formats are used – from the multilateral international cooperation within the Arctic Council to the cooperation with and between international organizations and forums, in addition to bilateral inter-state relations (Heininen, 2012). Non-Arctic states are keen to strengthen their role in the Arctic. They assert that their participation in international cooperation in that region is as useful as it is warranted and legitimate (Bartenstein, 2015). One of the most active players in the Arctic region is China. Being a non-Arctic country, China though is closely involved in the trans-regional and global issues in the Arctic, especially in such areas as climate change, environment, scientific research, utilization of shipping routes, resource exploration and exploitation, security, and global governance. The role of the country in the Arctic grows as China explores the possibilities of opening the Arctic passages as alternative routes for its BRI and investigates the social, economic and political implications of this engagement in the Arctic.

China's engagement with the Arctic has been driven by multiple concerns, particularly, strategic interests and trade interests (Peng & Wegge, 2015). Under the presidency of Xi Jinping, there has been a significant shift in Chinese cross-regional diplomacy towards subregional approaches (Lanteigne, 2014), particularly, a “5+1” dialog between China and the five Nordic states. The “5+1” dialogues cover various issues including economic cooperation, security concerns, and regional cooperation. China is paying increasing attention to the Arctic. The country pursues economic interests in the oil-and-gas sector and the exploration of resources of the Arctic territories of Russia and Northern Europe, as well as pays special attention to the development of Arctic shipping (Schulze, 2017).

China is also concerned about the effects of climate change and ice melting happening in Arctic waters. By 2050, climate fluctuations may dramatically change the conditions of navigation in the polar waters (Ratnikov, 2016). According to Mokhov and Khon (2015), by 2025, with less than 15% of water area covered by ice during Summer, the average duration of navigation period may increase up to 3-4 months, by 2050 – to 4-5 months, and by 2100 – to 5.5 months. Due to such a radical change of climate and ice situation, there may happen the changes of wind and cyclonic regimes in the atmosphere along the shipping route, as well as sea waves and iceberg dislocation in the seas of the Arctic Ocean (Khon et al., 2010). Mao et al. (2011), Zhang et al. (2006), and Liu et al. (2016) studied the effects of climate change in the Arctic and discovered the association between the sea ice concentration and ice melting in the Arctic Ocean and weather conditions in the northern parts of China. Kelmelis (2011) and Hong (2012) investigated the impacts of climate change in the Arctic on the exploration of transport routes in the Arctic Ocean, particularly, on China's maritime transport.

However, despite the economic, trade, investment, and research interests in the Arctic and its observer status in the Arctic Council, China was reluctant to officially incorporate the Arctic into the BRI. Arctic did not play a role in the initial structure of the BRI which involved creating maritime corridors through the Indian and Pacific Oceans (Erokhin, 2017). The BRI is a development initiative which focuses on the improvement of connectivity and collaboration among the countries of Eurasia through the increase of China's role in global affairs. The pursuit of strategic interests in the Arctic exactly conforms China's multifaceted, multilevel, and multidimensional diplomatic concept of development. With the release of the Vision for Maritime Cooperation under the BRI, China incorporated the Arctic shipping lanes into the BRI transport network. The document considerably altered the initial vision of the BRI's transportation infrastructure across the Eurasian landmass (Silk Road Economic Belt, or SREB) and the Indian Ocean (Maritime Silk Road, or MSR) by adding the Arctic passages (State Council of the People's Republic of China, 2018). Particularly, China outlined its interest in working with Nordic countries and Russia to improve sea transit conditions and survey for new resources. Concrete steps within the new vision of the policy include China's efforts on the development a blue economic passage linking China and Northern Europe via the Arctic Ocean. China has actually formalized its involvement in the development of the Arctic Blue Economic Corridor (ABEC) as one of the three passages within the BRI (Figure 1).

Figure 1. ABEC in the BRI network of corridors



Source: Authors' development.

The initiative of the extension of the BRI to the Arctic and participation of China in the development of the ABEC means that China is open to working with both Arctic and non-Arctic

countries to build the ABEC through developing the Arctic shipping routes. Within the ABEC initiative, China expects its involvement in the infrastructure construction for the ABEC routes in the Nordic countries and Russia and conduction of commercial trial voyages in the polar waters to pave the way for Chinese commercial, exploration, transport, and logistics operations. China also attaches great importance to navigation security along the prospect routes of the ABEC, particularly, in the seas of the Arctic Ocean controlled by Russia. As economic activity in the Arctic region grows, there is a potential for 5+1 dialogue on promoting collaboration between China and Nordic states in the areas of polar transportation, logistics, investments, as well as the development of infrastructure along the Arctic sea routes and connectivity in the region. China is willing to work with all parties in conducting scientific surveys of navigational routes, setting up land-based monitoring stations, carrying out research on climatic and environmental changes in the Arctic, as well as providing navigational forecasting services (Erokhin & Gao, 2018).

The approaches to the development of the ABEC are supposed to be based on three main pillars of China's Arctic policy, which are respect, cooperation, and "win-win" solutions.

China respects the rights of the Arctic countries and Indigenous people as enshrined in international law and supports the peaceful settlement of disputes over territory and maritime rights and interests in line with such treaties as the UN Charter, the United Nations Convention on the Law of the Sea (UNCLOS) and international law (State Council of the People's Republic of China, 2018). The position of China is that the management of Arctic shipping routes should be conducted in accordance with international law and that the freedom of navigation enjoyed by all countries in accordance with the law and their rights to use the Arctic shipping routes should be ensured.

Within the second pillar, China wants to be involved in collaboration for Arctic development. Being committed to the existing framework of international law and rules, China aims at the maintenance of a reasonable and well-organized Arctic governance system and steadily advancing international cooperation on the Arctic. The priorities of such cooperation under the BRI are policy coordination, infrastructure connectivity, unimpeded trade, financial integration, and closer people-to-people ties. In the Arctic, China wants to coordinate development strategies with Nordic countries and encourage joint efforts to build the ABEC linking China, Russia, and Europe via the Arctic Ocean and Russia's NSR (State Council of the People's Republic of China, 2018).

As to the "win-win" type of collaboration in the Arctic, China has the funding, technology, and the market to be of interest to Nordic countries. Chinese enterprises are encouraged to participate in joint investment projects in the Arctic, in the extraction of hydrocarbons and minerals, in infrastructure development for the ABEC, as well as to conduct commercial trial voyages along the transport corridors in the Arctic Ocean. China wishes to participate in the development of oil, gas, mineral resources and other non-fossil energies, fishing and tourism in the region, and scientific collaboration, jointly with Nordic states, while respecting the tradition and culture of Arctic residents, including indigenous peoples, and conserving the natural environment (State Council of the People's Republic of China, 2018).

Sea Routes in the Arctic Relevant for ABEC

Climate change and ice melting open up new opportunities for navigation in the Arctic Ocean through the three major passages which have been existed so far, i.e. Northwest Passage, Transpolar Passage, and the NSR, a part of the Northeast Passage (Ostreng, 2013).

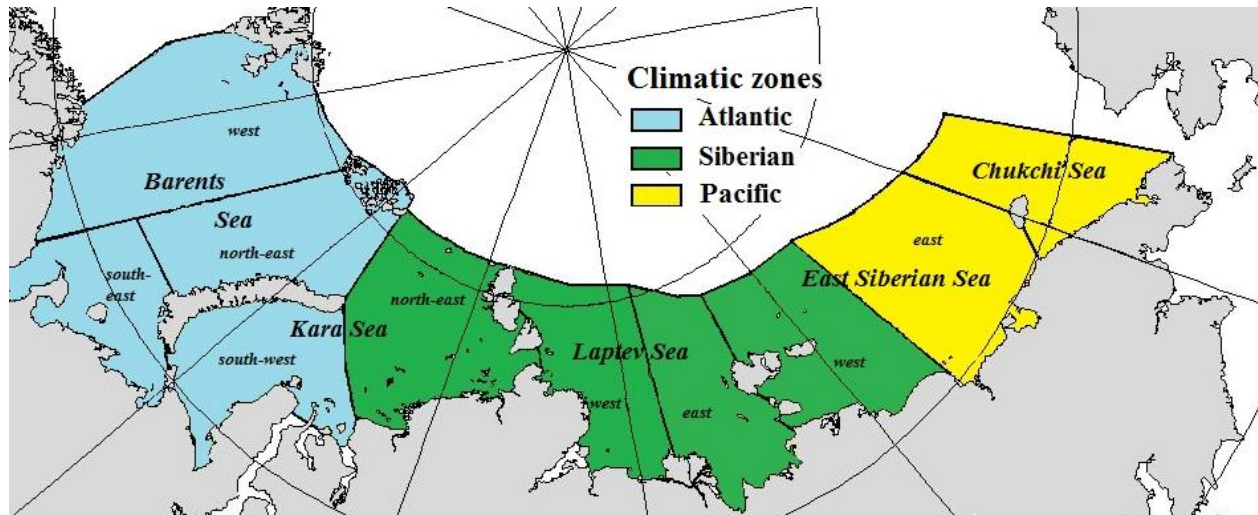
The Northwest Passage is a network of various possible ways between 19,000 islands of the Canadian Arctic Archipelago. Legal status of the Northwest Passage has not been formalized by any international agreement. However, because the route passes within the territorial waters of Canada, the sovereign regulations of Canada are applied. The Northwest Passage is relatively deep to accept supertankers and container carriers which draft is too big to pass through Panama Canal. In the light of the establishing ABEC, Northwest Passage cuts both the distance and time for Chinese vessels compared to other transport corridors. Thus, the distance between Shanghai and New York via Panama Canal is 10,500 nautical miles and only 8,600 nautical miles via Northwest Passage (savings of almost 2000 nautical miles and 7 days). However, in terms of its commercialization in the near future, the passage is of no interest due to the extreme unpredictability of climate conditions of Canada Arctic Archipelago. Other factors against the immediate commercialization of the Northwest Passage and building any economic corridor in that part of the Arctic are underdeveloped infrastructure and passing of the route along the underpopulated and unexplored territories in terms of extraction of mineral resources and any other kinds of economic activities (in contrast to the NSR) (Jorgensen-Dahl, 2010). Thus, the passage may be used only for transit between dispatch and destination points without an additional load in transshipment points.

The Transpolar Passage (TP) is the shortest way from Europe to Northeast Asia through the North Pole. Sailing along this route requests passing heavy and perennial sea ice. However, as of Smith and Stephenson (2013), ice conditions may become easier, and optimal transport routes between Asia, Europe, and North America may move to the central parts of the Arctic Ocean. Apart from a substantial cut of a path length, the advantage of this route for Chinese vessels is that they do not have to enter territorial waters of Russia or Canada. In the near future, commercial shipping along the TP will require not only icebreaker assistance but also the usage of ice-strengthened cargo vessels. Apart from the technical complexity of sailing along the TP, there are certain legal issues to be solved. It is highly likely that any country willing to establish a navigation in the central part of the Arctic Ocean will have to negotiate with Russia and all the Nordic states. Delays are quite possible. It may happen that no vessel can avoid entering the territorial waters of Russia and all the Nordic states because of heavy and changing ice conditions and other emergencies.

Compared with the Northwest and TP, the NSR has the best potential in terms of the development of commercial shipping, extraction of mineral resources, production, and other kinds of economic activities. In terms of the establishment of the ABEC, the opportunities include transit shipping (cargo transportation between non-Arctic ports of Europe and Asia through the NSR) and special-purpose shipping (activities that start and/or end in the Arctic). Availability of energy (oil, gas, and coal) and mineral (iron, non-ferrous and rare-earth metals, and phosphates) resources has made special-purpose shipping focused on the transportation of resources from the Arctic to Asia and Europe the most economically attractive kind of commercial activity along the NSR and, potentially, the ABEC.

As regards the climate conditions for navigation, the NSR may be divided into three climatic zones (ABS, 2016) (Figure 2):

Figure 2. Climatic zones along the NSR



Source: Authors' development

The Atlantic zone includes the Barents Sea, the western part of the Kara Sea, and part of the Arctic Ocean to the North. There are frequent storms in Winter and cloudy weather with frequent fogs and rain in Summer. In the Barents Sea, the average temperature is $+7^{\circ}\text{C}$ in Summer and -20°C in Winter. Wave height up to 7 m. In the Kara Sea, the average temperature is $+6^{\circ}\text{C}$ in Summer and -28°C in Winter.

The Siberian zone includes the eastern part of the Kara Sea, the Laptev Sea, and the western part of the East Siberian Sea. Winter temperatures are lower compared to Atlantic and Pacific zones, while Summer ones are usually higher (in the southern coastal part of the zone). In the northern part of the zone (Arctic Ocean) Summer is cold ($+1^{\circ}\text{C}$ in the northern part of the Laptev Sea in Summer and down to -34°C in Winter).

The Pacific zone includes the eastern part of the East Siberian Sea, the Chukchi Sea. The Pacific Ocean influences the climate of the zone in Winter, consequently, air temperature is higher, winds are stronger, and precipitation is heavier compared to Atlantic and Siberian zones. In the East Siberian Sea, the average temperature is $+7^{\circ}\text{C}$ in Summer and down to -33°C in Winter. There are frequent storms, air temperature fluctuations, and heavy fogs in Summer.

ABEC, NSR and Russia

Until recently, the NSR had been used exclusively for internal Russia's transportation, i.e., provision of Russia's regions of High North and commercial cargo shipments by Russian oil-and-gas and mining companies. Arctic zone of Russia accounts for over 10% of Russia's GDP and 20% of export revenue (Heininen et al., 2014). With over 200 oil and gas continental and offshore deposits, Arctic territories of Russia hold most of the Arctic's hydrocarbon reserves. The region is the most prolific producer of Russian gas (95%) and oil (about 70%), primary and

placer diamond (99% of total Russian production), platinum-group elements (98%), nickel and cobalt (over 80%), chromium and manganese (90%), copper (60%), antimony, tin, tungsten, and rare metals (from 50 to 90%), and gold (about 40%) (Sergunin & Konyshev, 2016).

With the development of exploitation of natural resources and construction of new production facilities along the potential ABEC route, Russia is very keen to increase the contribution of Arctic territories to the domestic product. Over the last few years, the total cargo turnover of the NSR (domestic Russia's transportations plus Europe-Asia transits) has increased substantially from 2.0 million tons in 2011 to almost 7.3 million tons in 2016 (Administration of the Northern Sea Route, 2018). The growth has been contributed by the launch of big projects on infrastructure construction (Sabetta seaport) and resource extraction projects (Yamal-LNG plant for production of liquefied natural gas) by Russian oil-and-gas companies and international consortiums. However, international transit shipments have been decreasing. In 2016, the entire route from Europe to Asia or back was passed by 19 vessels with 214,500 tons of cargo (compared to 2013, when the transit cargo turnover almost reached 1.2 million tons carried by 73 foreign-flag vessels) (Administration of the Northern Sea Route, 2018). The major cargo was coal (155,000 tons, or 70% of the total transit turnover in 2016).

There are several reasons for such a decrease in transit shipping. On the one hand, during the period of growth of transit shipping in 2011-2013, Russia almost failed to develop the infrastructure of the NSR apart from the continuous construction of new seaports and marine surveys (Bai & Voronenko, 2016). On the other hand, due to the drop in oil prices, the economic conditions of usage of the NSR have changed dramatically (Erokhin, 2018). Cheaper fuel has erased the cost advantage of a shorter distance compared to the traditional southern routes via the Suez Canal, especially since sailing through ice fields assumes increased fuel consumption. The oil price gap between European and Asian markets has also narrowed thus decreasing the profitability of intercontinental transportation of hydrocarbons.

ABEC and the Nordic Countries

Despite the short-term deterioration of the economic environment, China expects to redirect up to 1% of its foreign trade to the northern routes by 2020 (Erokhin, 2018). China looks forward to developing the ABEC as a link between Chinese and European markets and therefore expects the involvement of the EU countries, particularly, Nordic ones, to the development of this initiative. EU member states combined have the world's largest merchant fleet that is why the EU's policies in the Arctic are focused on transportation (Ostreng, 2010). Extending from Europe to Asia, the ABEC could shorten the time taken by cargo vessels to travel between the Pacific and the Atlantic by about one third which may save energy, reduce emissions, promote trade, and diminish the pressure on main trans-continental navigation channels. In the sphere of Arctic shipping, the EU wants to maintain its competitive lead in developing the technology required for Arctic conditions, i.e. specially designed icebreakers and cargo vessels. Nordic countries, however, have different interests and expertise to bring to the table in the China-Nordic cooperation (Table 1).

Table 1. Priority areas and expertise of the Nordic countries in the China-Nordic cooperation

Country	Priority areas	Expertise
Denmark	Self-sustaining growth and development	Exploitation of mineral resources
		Exploitation of renewable energy potential
		Knowledge-based growth and development
	Development with respect to climate, environment, and nature	Vigorous and ambitious knowledge building on climate change in the Arctic and its consequences in order to foster global and local adaptation to far-reaching change
Environment and nature management based on the best possible scientific knowledge and standards for protection		
Finland	Construction and infrastructure	Offshore and maritime industries
		Shipbuilding and shipping
		Generation and distribution of electricity
		Energy saving and energy efficiency
	Knowledge	Internationally-recognized expert in the Arctic
		Knowledge-based service provider services and new business models for the Arctic
Iceland	Information society, human resources, and new opportunities	Access to a cost-effective telecommunications system with sufficient carrying capacity for the residents of the Arctic region
		A hub for Nordic and Chinese institutions, companies, and research facilities
	Trade	Free Trade Agreements
	Energy	Development of renewable energy
Norway	Industry	Exploration and exploitation of oil and gas offshore fields
		Fishing
	Business development	Economically, socially and environmentally sustainable business development
		Value creation based on the region's resources
	Infrastructure	Reliable, efficient and environmentally sound transport system
		Secure and efficient power supply
		Broad access to good digital infrastructure
	Reduction of greenhouse gas emissions and local pollution, reduction of negative environmental impacts of infrastructure development	
Sweden	Science and technology	A supporting country by providing services, scientific research, and public information
		Human development
		Research in the sphere of climate change and its effects on transport routes, industries, and people
	Economy	Promotion of free trade and industrial development in the Arctic

Source: Authors' development.

Denmark's priorities in the region are formalized by the Kingdom of Denmark Strategy for the Arctic 2011-2020. They include self-sustaining growth and development; development with respect for the Arctic's vulnerable climate, environment, and nature; and close cooperation with international partners (Government of Denmark, Government of the Faroes, & Government of

Greenland, 2011). Being one of the leading shipbuilding and shipping states in the world, Denmark devotes much attention to the development of Arctic transport corridors. Many Denmark's territories, especially Greenland, are favorably located in relation to both the EU and the US. Therefore, the country may consider its involvement in the development of the ABEC and expansion of trade with Asian markets. Greenland is interesting for China for its natural resources and as a hub on the ABEC route (Seaman et al., 2017). Mortensen et al. (2016) and Tetu and Lasserre (2017) report that China plays an important role in mining development and is often considered one of the most important partners for Greenland in mining its abundant natural resources, primarily, rare earth elements, uranium, and zinc. According to Shi and Lanteigne (2018), China's interests in Greenland have not only included emerging mining opportunities, but also the areas of infrastructure planning, tourism, and scientific cooperation.

One of the core priorities of Finland in the region is an achievement of a statue of an internationally-recognized expert in the Arctic. Though Finland does not have a direct access to the seas of the Arctic Ocean, the country pays much attention to the development of the transport corridor from Europe to Asia and North America through Lappeenranta, Russian cities of Saint Petersburg and Moscow, Sweden, and Norwegian seaports. As of Schulze (2017), the country seeks a role as a knowledge-based service provider and invests in research and development of technologies, services and new business models for the Arctic. In the light of Finland's participation in the ABEC, major areas may include offshore and maritime industries, shipbuilding and shipping, construction and infrastructure, mining and minerals, generation and distribution of electricity, energy saving and energy efficiency, and others. Consequently, economic interests of Finland in the ABEC are focused on shipbuilding (particularly, icebreakers), mining, and construction of the related industrial, transport and distribution infrastructure (Telegina & Morgunova, 2012).

Similar to Finland, Sweden has no direct access to the Arctic Ocean. Therefore, in the ABEC format, Sweden should establish itself as a supporting country by providing services, scientific research, and public information. Chinese investment in Sweden is partly directed towards production, but technology and innovation stand out as the main driving factors in attracting investment (Seaman et al., 2017). Sweden's priorities in the Arctic include climate, biodiversity, and environmental protection; economic development and promotion of free trade and industrial development in the Arctic; human development, health issues, and influences of climate change and hazardous substances on the population, indigenous cultures, and industries.

The prospects of Iceland's participation in the ABEC are logically suited to its position as a small state in a sensitive and geographically central setting (Bailes et al., 2014). Iceland is located by the Arctic Circle and within the Arctic more than other countries rely on the fragile resources of the Arctic region (fishing, tourism, and renewable energy). Iceland's Arctic strategy is embedded to the context of the general European approaches to polar activities. Iceland may contribute to the ABEC by promoting trade relations in the Arctic, including in the format of free trade agreement with China, and developing itself into a hub for Nordic and Chinese institutions, companies, and research facilities. Guschin (2015) expects that commercial shipping offers a broad perspective on the cooperation between Chinese COSCO and Icelandic Nesskip in the segment of container carriage, implementation of energy saving solutions, and reduction of CO₂ emissions.

For Norway, the overarching goals in the Arctic are peace, stability, and predictability; integrated, ecosystem-based management; international cooperation and international legal order; and stronger basis for employment, value creation, and welfare (Norwegian Ministries, 2017). In terms of Norway-China collaboration on the economic development of the Arctic, the major areas are the exploration and exploitation of oil and gas offshore fields, fishing, and tourism. Among the five priorities which have been identified as crucial for Norway in the Arctic (Norwegian Ministries, 2017), at least two (business development and infrastructure) correspond with ABEC's areas. Particularly, Norway should develop a reliable, efficient, and environmentally sound transport system in the Arctic; ensure that the transport system is able to meet the business sector's international transport needs; ensure a secure and efficient power supply and broad access to good digital infrastructure; promote economically, socially and environmentally sustainable business development; increase value creation based on the region's resources.

Major Challenges of the ABEC

There are many specific technological and economic challenges to be considered and met before the ABEC may become any viable alternatives to southern maritime routes used by China. High insurance expenses, low speeds, stringent security regulations, high environmental risks, unpredictable ice, wave, and wind conditions, varying routes, lack of qualified and experienced staff to facilitate safe sailing in polar waters are just a few challenges to the intensification of China's shipping and economic activities in the Arctic (Fisenko, 2014). In terms of its economic viability, major downsides the ABEC project are its unsuitability for containerized cargo shipping (Farre et al., 2014), underdeveloped infrastructure, and seasonality of transportation.

While the NSR may provide a viable alternative for liquid and bulk cargo shipping (e.g., oil, coal, and ore) in the near future, it may be of limited value for container shipping. Container carriers need schedule adherence along with predictable climate conditions and unified operations on cargo loading and discharging at the port terminals (Lasserre, 2014). So far, the MSR has been the more sustainable route for China's container vessels even in the light of long distance and possible delays due to the heavy traffic in the Malacca Strait and Suez Canal. As against the MSR, navigation conditions in the polar waters are far less predictable because of seasonal fluctuations of ice cover and diurnal variations of wind and wave regime. Any change in the weather may either break the delivery schedule (delay, extra operational costs, and risk of penalty payments) or request icebreaker assistance (an increase of freight cost, additional expenses due to icebreaker support). Consequently, despite the bright long-term perspectives of the ABEC development, in the foreseeable future China's cargo container flows will continue moving southward – not only because of easier navigation conditions but also due to the proximity of southern transport corridors to the emerging markets of India, Pakistan, Middle East, and East Africa (Fisenko, 2013).

Economics of the ABEC requires massive cargo flows by many carriers. Current sporadic shipments with the involvement of only several dozens of vessels (taking into account the decreasing number of transits since 2014) are economically unviable. In terms of economic benefits, for China, the ABEC project is attractive in case of high oil prices, when saving time by shipping a shorter route may cause essential saving of fuel and, consequently, money. Only, in this case, the costs associated with sailing by the NSR may be recuperated by shorter distance and time. To take a ship from a logistic chain and forward it through the NSR, Chinese shipping

companies need massive investments to the development of the Arctic fleet, the year-round availability of the route, and the possibility to deliver cargo without delays.

One of the keystone ideas of the ABEC, at least in the first instance, is that cargo flow is created by means of export of hydrocarbons and other natural resources produced in the Arctic. However, sectoral sanctions against Russia forced most of the Western companies to quit from the projects in the Arctic, primarily, from oil and gas extraction. Being under the Western sanctions, Russia has neither financial resources nor technological solutions for effective exploitation of natural deposits in the Arctic, particularly, in the shelf areas (Gao & Erokhin, 2017). Russia would like China to invest in an exploration of Russia's Arctic shelf. Particularly, Russia expects China to participate in the investigation of shelf areas in Barents and Pechora seas (with Rosneft), to exploit Shtokman gas field and Prirazlomnoe offshore oilfield (Smirnova et al., 2016). Russian Government provides favorable treatment regime for Chinese investors, including tax holidays. Nornickel is interested in China's involvement in the exploitation of the deposits of rare-earth metals, vanadium, molybdenum, and wolframite in the Kola Peninsula, Taimyr Peninsula, and northern parts of the Republic of Sakha (Yakutia) (Ivanov, 2016).

One of the critical challenges to the commercial viability of the ABEC is the necessity of icebreaker assistance to pass along the NSR. The high cost of assistance provided by Russia nearly evens the distance and time advantages of using the NSR instead of the southern routes of the MSR. Without high-capacity icebreakers, navigation along the maritime routes of the ABEC is unsustainable. Ice is not the only challenge for Chinese cargo vessels to face in the Arctic. Low predictability of weather conditions, heavy storms, extreme temperature, drifting icebergs, and the fields of thin first-year may either disrupt deck machinery and navigation equipment or even damage the vessel. Observed climate change and ice melting are not quite simplistic. Many experts warn that shrinkage of ice cover in the Arctic Ocean may drive uncontrollable changes of weather and thus make navigation even less predictable than it is today. Major risks are strong winds, extreme waves, detachment of icebergs, erosion of the coastline, and damage of inland port and transport infrastructure (Overeem et al., 2011; Ogorodov et al., 2016). In view of all those problems and challenges, implementation of the ABEC initiative requires substantial investment to the construction and renovation of the infrastructure for production and extraction of resources, cargo shipping, icebreaking assistance, and safer navigation and rescue.

Solutions

To ensure stable and on-schedule navigation along the ABEC maritime routes, construction of modern icebreakers is required. Russian nuclear-powered fleet is outdated and predominantly not suitable for piloting large-capacity vessels. China needs construction of nuclear-powered icebreakers able to pilot large-capacity tankers, bulkers, and container carriers through thick ice. The major challenge of the ABEC in terms of the commercialization of the polar shipping and decrease of icebreaker assistance costs is how to ensure the maximum available load of the route by cargo vessels during the four-month navigation window.

Most of the territories along the prospective ABEC, primarily, along the Russian part of the NSR, have inadequate infrastructure to support shipping. This includes such infrastructure components as the availability of ports and port facilities needed for different types of vessels operating in Arctic waters, the accuracy and availability of information needed for safe navigation

and availability of search and rescue assets. Berthing facilities need overhaul renovation and reconstruction. Seaports need dredging to be able to receive modern large-capacity vessels. In most of the ports, there should be constructed and developed facilities for reception and utilization of shipboard wastes. It is necessary to develop infrastructure for berthing, loading, and discharging of vessels at various points of the ABEC throughout the year. Communication systems are generally adequate for the lower parts of the Arctic, but data transmission becomes problematic when the vessels have to move to higher areas of the NSR because of the ice situation.

Taking into account the integrated and comprehensive nature of the ABEC initiative, activities in this field has to become increasingly international. The principal areas for collaboration between China and Nordic countries and Russia are:

- Geography (the study of the continental shelf of Nordic countries and Russia potentially involved in the ABEC, delineation, and amendment of maritime boundaries).
- Geology (geological surveying of hydrocarbons and mineral resources, evaluation of potential deposits for their exploration).
- Ecology (analysis of climate change and environmental problems with emphasis on the negative environmental effects of resource exploration, shipping, and other kinds of economic activities in the Arctic).
- Economy (economic evaluation of discovered deposits of hydrocarbons, mineral, biological, and other resources of the Arctic; perspective directions of the development of commercial shipping in polar waters).
- Sustainability (elaboration of effective solutions on the convergence of economic benefits from exploring the Arctic with the urgent need for sustainable development a fragile Arctic environment, conservation of resources, biodiversity, and food security).
- Security (development of the mechanisms for collaboration between the Nordic countries, Russia, and major non-Arctic actors for peaceful and secure development of the region).

Specific interests of China in the region include surveying of the mineral resource potential of the territories along the future ABEC routes. Mineral resources have not yet been extensively explored and developed. China's long-term goal is to focus on maintaining a high level of exploration activity for oil and gas in Norway to increase the possibility of making commercial discoveries. With regard to minerals in Greenland, China aims to maintain the development of mineral exploration and increase the level of knowledge regarding attractive geological areas in Greenland. Mining is not the only area on which the ABEC may be built. A number of other areas include energy-intensive industries based on potentially available hydro and thermal power (Greenland and Iceland), infrastructure and related industries (Finland and Russia), commercialization of maritime transport routes (Russia), research and development (Sweden and Iceland), tourism (Nordic countries and Russia), and the fishing industry (Iceland and Norway).

Contemporary policies of principal actors in the region should be focused on the following major areas:

- protection of fragile Arctic environment, reduction of greenhouse gases, preservation of biodiversity, and protection the Arctic Ocean from pollution;
- establishment of scientific networks, international cooperation, and expansion of research funding with a focus on interdisciplinary polar research on the climatic changes and sociocultural developments in the Arctic;
- provision of an access of the local population to education, e.g. through modern communication technologies and distance learning; building-up training and study programs and the establishment of Arctic education programs in schools and universities (in non-Arctic countries too);
- exploration and exploitation of oil and gas in the Arctic, mining of mineral resources, in particular, rare earth elements, iron ore, precious metals, and diamonds, expansion of the required off- and onshore infrastructure in a sustainable and ecologically responsible way;
- expansion of transport routes to link the region to major markets of the world (Europe, Asia, North America); development of new shipping routes and the intensification of maritime traffic on the transport corridors on the Arctic Ocean (NSR and Northwest and Transpolar passages);
- development of marine technology and the expansion of the maritime infrastructure (ports, access roads, and container terminals);
- expansion of the technical infrastructure such as energy supply and communication;
- exploration and exploitation of existing and new fishing grounds for marine resources;
- expansion of tourist facilities, accommodation and targeted marketing for Arctic destinations.

Arctic region is now changing at an unprecedented pace, in the ways that fundamentally affect ecosystems, people, biodiversity, and sustainability. Such changes are driven primarily by external factors: climate and environmental change, rapid social and economic developments, and industrialization. Increasingly frequently, business interests (extraction of mineral resources, cargo shipping, extensive fishing, tourism, etc.) interfere with the sustainable development goals. Arctic social and environmental systems are deeply intertwined with both the environmental systems and economic development of other regions of the world, so rapid changes in this sensitive region are likely to be felt elsewhere. That is why the cooperation for sustainable development has to be put at the top of the China-Nordic ABEC agenda.

Conclusion

The initiative of the establishment of an economic corridor in the Arctic is an integral element of the long-term vision of the region by China. Despite the strategic orientation of the BRI to the southern transport corridors, China is rather dependent on the situation in Malacca and Suez (Sun, 2014; Lanteigne, 2013). The ABEC initiative is as an attempt to diversify maritime transport routes and ensure long-term security trading for China. The resource-rich Arctic offers new possibilities in China's global search for energy and strategic engagement in the region. However, the prospective vision of the ABEC is not only about securing trade routes. The overarching goal

is to facilitate connectivity between China and Nordic countries, to ensure sustainable economic and social development of the Arctic, and to bridge the gap between traditional industries in the Arctic and China's market. Chinese shipping in polar waters in the coming years will form the backbone of the BRI process in the Arctic, which will require collaboration with Nordic countries and Russia, on the co-development of transport infrastructure and cargo-generating facilities along the Arctic routes.

For the Nordic countries, Russia, and other stakeholders involved, there are certain geopolitical and commercial advantages of the ABEC initiative, as well as risks. Nordic countries and Russia look forward to attracting investment to the mining and infrastructure projects in the Arctic, increase export of hydrocarbons and minerals, and benefit from serving transit navigation along the opening maritime routes. China would like to ensure its presence in the Arctic projects, get access to economic resources and shipping routes in the region, and incorporate the entire region into the BRI network. However, there are many specific technological and economic challenges to be considered and met before the ABEC may become a viable alternative to the MSR. Development of the ABEC requires extensive construction and reconstruction of the infrastructure along the entire route from Russian Chukotka in the east to Iceland and Greenland in the West: deep-water seaports with modern logistics and service, transport hubs, support and rescue points for safe and stable transarctic shipping, and refueling points for transit vessels passing the route from China to Europe and back.

The success of the ABEC is only possible with the attraction of foreign investments. In such a situation, future development of the ABEC and China's position in the initiative depend on the willingness of Nordic countries and Russia to attract China's investment. The economies along the potential ABEC have a wide range of assets and features that Chinese investors seek, i.e. hydrocarbons and maritime transport in Norway and Russia, shipbuilding in Finland, research and development in Sweden, mining in Denmark (Greenland), renewable energy and rare-earth metals in Iceland, among others. However, the magnitude and certain patterns of China's activities in the region have also raised concerns as Chinese companies have begun to buy what some consider critical infrastructure (Seaman et al., 2017). To overcome challenges of strategic mistrust, China should further engage Nordic countries and other stakeholders to reassure them of its intentions (Liu, 2018). China should not solely rely on its economic largesse to win the support of its potential ABEC partner nations. Over the long term, China will need to highlight the less visible benefits of the ABEC, such as sharing of development experience and expertise, the promotion of regional cooperation, and the delivery of more global public goods.

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