

Russia's Arctic Policy: Focusing on the Construction of the Arctic Route and its Challenges

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The greatest change resulting from the Arctic thaw is the activation of Arctic resource development and the development of Arctic ports. In this regard, Arctic governance and Arctic regimes arising from climate change, global warming, resource development, Arctic Route, logistics, maritime boundary delimitation, environmental and biodiversity conservation and sustainable development are underway, and the activities of the Arctic Council (AC). Russia is now investing funds in a comprehensive approach to the collection of information on waterways, hydro-meteorology and maps and the strengthening of safety measures for the prevention of oil spills. In light of this, Russia has proceeded with long-term use and development of the Northern Sea Route despite the constraints of the Arctic environment and conditions. It is also calling for government cooperation with business entities in the development of a nuclear-powered icebreaker fleet. In particular, Russia has played the most active role in Arctic development such as resource development and military base construction with a focus on icebreakers. In this context, the main purpose of this article is to examine sustainable Arctic development policies focusing on the characteristics of Arctic policies and the status of Arctic ports and railway and road networks under Vladimir Putin's presidency.

Keywords: Arctic Environment, Northern Sea Route, Arctic Development Complex Logistics System, International Cooperation

Introduction

The most important reason for many countries, including Russia, to have an interest in Arctic¹ resource development and the Arctic Route is due to the economic potential of the Arctic. Rapid global warming has resulted in a long thawing season in the Arctic, and the average temperature has changed from –30 to –25 degrees. Thus, the navigation

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season for the Arctic Route, which was previously two to three months a year a decade ago, has now expanded to seven to eight months each year. The greatest change resulting from the Arctic thaw is the activation of Arctic resource development and the development of Arctic ports. For example, mining was carried out in Alaska, United States and Canada during the 1960s and 1970s, but the mining area was extended to include the inland areas of Russia from the 1980s. It then became possible to develop the Port of Sabetta in the Yamal Peninsula of Russia in the 2000s. In 2017, the volume of cargo transportation through Arctic ports was 74.2 million tons, showing a 49 percent increase from the previous year. In particular, cargo transportation in the Port of Murmansk, Russia increased to 51.7 million tons, a 55 percent increase from the previous year. Even Daewoo Shipbuilding & Marine Engineering (DSME), a shipbuilder of South Korea, is actively involved in receiving orders of icebreaking LNG carriers and developing icebreaking container ships for shipyards.²

The latest data shows that 80 percent of the world's industrial production is done in the region at 30 degrees north latitude, and most of the important industrial areas are located within 6,000 kilometers of the Arctic. Therefore, it is expected that the economic efficiency of international logistics transportation through the Arctic Ocean will become greater. In this regard, Arctic governance and Arctic regimes arising from climate change, global warming, resource development, the Arctic Route, logistics, maritime boundary delimitation, environmental and biodiversity conservation and sustainable development are underway, and the activities of the Arctic Council (AC) and various Arctic policies of the Arctic states are currently being carried out.³ The AC has allowed the entry of all nations and recognized the exclusive economic zones (EEZ) of neighboring countries to reconcile their differences and maintain a cooperative atmosphere.

Russia has the longest coastline among the Arctic coastal states (Russia, the United States, Canada, Denmark (Greenland) and Norway), and territories ranging from Murmansk in the far northwestern part to Siberia and the Far East are included in this Russian territory. In light of this, Russia has proceeded with long-term use and development of the Northern Sea Route despite the constraints and conditions of the Arctic environment. Recognizing the Arctic as an important region of national security, geo-economics and geo-politics, Russia adopted the "Maritime Doctrine of Russian Federation 2020" in July 2001. Russia is now investing funds in a comprehensive approach to the collection of information on waterways, hydro-meteorology and maps and the strengthening of safety measures for the prevention of oil spills. It is also calling for government cooperation with business entities in the development of a nuclear-powered icebreaker fleet.

In particular, Russia has played the most active role in Arctic development such as resource development and military base construction with a focus on icebreakers. For the last few years, Russia has engaged in Arctic surveillance activities using TU-95MS strategic bombers and sent in the nuclear submarine Severodvinsk and an icebreaker fleet to occupy the Arctic region. Moreover, it has established the OCK "Север," Arctic Joint Strategic Command, the armed forces of the Russian federation with its jurisdiction within the northern region, which began operations in December 2014.⁴ Through this,

the Russian armed forces have greatly expanded Arctic armament and military drills. Russian Minister of Defense Sergei Shoigu declared that Russia would deploy troops across the entire Arctic coast, which extends over a distance of 4,700 kilometers from Murmansk, the northwestern region, to Chukotka in the Far East region.⁵

In relation to the rapid change of environment in the Arctic region, various Arctic-related studies have been carried out from both the government and private sectors at home and abroad.⁶ Most of the Arctic studies conducted at home and abroad have focused only on energy development, the environment, disputes over maritime territories, and maritime boundary delimitation. Looking at recent trends in academia, the characteristics of the Arctic Ocean, including the political and economic potential of the Arctic, the Arctic cooperation with Russia and national security issues such as the Arctic governance have emerged as important research subjects.⁷

In this context, this article seeks to examine sustainable Arctic development policies focusing on the characteristics of Arctic policies and the status of Arctic ports and railway and road networks under Vladimir Putin's presidency based on literature reviews and case studies of existing Arctic research. The outline of the following chapters is as follows. Chapter II investigates the geopolitical characteristics of the Arctic and Russia's Arctic policies and features. Chapter III analyzes the methods of establishing a complex logistics system for the Arctic Route and constraints with a focus on "Russia's Railway Transport Development Strategy 2030." Chapter IV examines Russia's international cooperation on Arctic issues and implications.

Features of Arctic Geopolitics and Russian Policy towards the Arctic

The Arctic refers to the region around the North Pole. Unlike the Antarctic Continent, the central part of the Arctic is mostly covered with thick ice. The Arctic Ocean has an average depth of 1,200 meters and an area of 1,200,000 square kilometers which covers eight percent of the Earth's crust and 15 percent of the land area. It is four times the size of the Mediterranean Sea, and accounts for three percent of the world's seas. Until the early 20th century, the Arctic was relatively unknown to people, except for a few explorers. During the Cold War era, the Arctic was a closed space in which a U.S.-led NATO and the Soviet Union confronted each other militarily.⁸ The Arctic has been a region with limited access for a long time. However, as the adjustment of conflicting interests between the Arctic coastal states, including Russia, has taken place, development and research on the Arctic is now being carried out.

In the Post-Cold War era, the Arctic has become more accessible than ever due to climate change. Recent rapid climate change and Arctic permafrost thawing caused by global warming have become major factors in expanding human living space to the north. As mentioned above, human access to the Arctic has long been limited, but the establishment of mutual interests has led to the active development and research of the Arctic. In addition, as rapid climate change that occurs in the Arctic and thawing phenomenon resulting from global warming have increased the availability of the Arctic

Circle, the importance of the Arctic has been highlighted not only in the Arctic states, but also on a global level. In terms of law and sovereignty, the stakeholders of the Arctic are eight countries, including the five coastal countries Russia, the United States, Canada, Denmark (Greenland) and Norway, and three non-coastal countries Iceland, Sweden and Finland.⁹ The three largest residential areas in the Arctic are all composed of Russian cities. Murmansk with a population of 300,000 people, where 50 percent of the Arctic population resides, is the largest city in the Arctic, followed by Norilsk (170,000 people) and Vortuta (60,000 people).¹⁰

These countries founded the Arctic Council, an international organization that addresses the issues faced by the Arctic government and the indigenous people of the Arctic, in 1996.¹¹ In the new geopolitical changes in the Arctic, not only the Arctic states, including the five Arctic coastal countries (the “Arctic-5”) and the three non-coastal countries, but also non-Arctic countries are included as stakeholders. In May 2013, Korea, China Japan, India Singapore and Italy became new permanent observers of the Arctic Council, with existing observer states such as the UK, Germany, France, the Netherlands, Poland and Spain, among the non-Arctic countries in the Post-Cold War era.¹² As the Arctic Council has expanded to include 12 countries, the opportunities for research and international cooperation on the Arctic have increased (see Table 1). Although the European Union (EU) failed to gain permanent observer status, it is highly likely to become a member. Other non-Arctic countries are also very interested in Arctic changes in relation to sea level rises caused by global warming and so on.¹³

The Arctic resources are as follows. According to the 2008 Unites States Geological Survey (USGS), 13 percent of the world’s undiscovered oil reserves (90 billion barrels) and 30 percent of natural gas (1,700 trillion cubic meters of natural gas and 44 billion barrels of liquefied gas) are estimated to be buried underground. The biggest deposits of oil and natural gas (more than a quarter of the world’s reserves) are found in the Arctic continental shelves. Approximately 12 billion barrels of oil and 4.5 trillion cubic meters of natural gas are buried in the Arctic waters of the United States and Canada. In addition, it is estimated that about seven billion barrels of oil are buried in the western Chukchi Sea. More than 90 percent of natural gas is concentrated in the Russian Arctic. Moreover, 65 percent of the resource reserves are found in Western Siberia (Russia) and

Table 1. Organizational Status of Arctic Council

Permanent participants	Coastal states	USA, Canada, Russia, Norway, Denmark
	Non-coastal states	Sweden, Finland, Iceland
	Indigenous groups	Ethnic minority groups in the Arctic Circle such as Inuit and Saami people of Norway
Existing permanent observers	UK, Germany, France, Spain, Netherlands, Poland	Participation of working-level groups
New permanent observers	Korea, China, Japan, Italy, Singapore, India, Switzerland, EU (ad hoc observer)	Participation of working-level groups

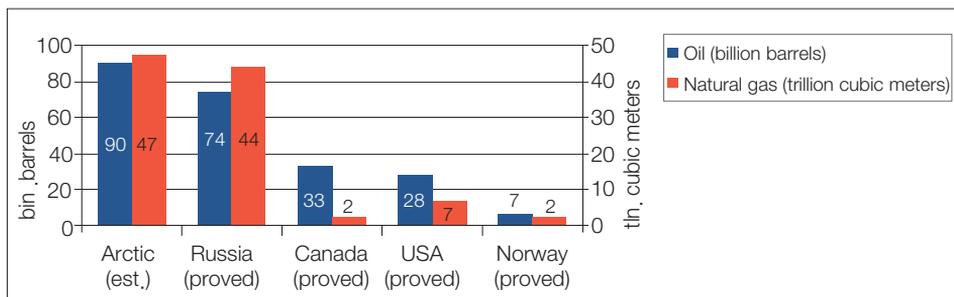
the Barents Sea, and Alaska in the United States (see Figure 1). The total production in 2020 is expected to be 21.9 billion barrels, a 34.4 percent increase.¹⁴

Russia has the largest amount of territory and resources among the Arctic nations and is active in developing Arctic resources and routes. The Arctic development of Russia began around the 19th century in Murmansk and Arkhangelsk. Russia is now known to occupy 40 percent of Arctic territory. The number of Russians residing in the Arctic accounts for about two percent of the total Russian population, and their GDP is about 10 percent of the total GDP.¹⁵ The Arctic contains a wealth of mineral resources, in addition to petroleum and natural gas, with an estimated value of more than one trillion dollars.¹⁶ Arctic industrialization began through the Transpolar Highway, which connects the east and west sides of the Arctic, the mining of nonferrous metals in Norilsk, and coal mining in the Vorkuta district in the 1930s. Since then, an increase in the population and military troops stationed in the Arctic has led to stable growth.¹⁷

The value of underground resources in the Russian Arctic is estimated to be more than 22.4 trillion U.S. dollars. About 10 percent of the world's nickel reserves, 19 percent of the planet's platinum metal reserves, and more than three percent of zinc reserves are buried in the Arctic. Moreover, 95 percent of Russia's nickel and cobalt production comes from the Arctic. In addition, 80 percent of natural gas, 60 percent of copper and 100 percent of barite and apatite, and 15 percent of seafood are being developed and produced in the Arctic region. Meanwhile, 90 percent of the Arctic oil mined by Russia is from the Yamal–Nenets autonomous district, and gas production is also expected to increase by three to four percent in 2018.¹⁸

Norilsk in northern Russia has the world's largest nickel, palladium and copper mines, and the Kola Peninsula has the world's largest deposits of apatite. There is an open pit iron mine in the Mary River area of Baffin Island, and the area around the Bering Sea contains the world's largest zinc and coal mines. Greenland holds rare-earth metals, and iron ore and coal are buried in the northern area of Scandinavia.¹⁹ In addition to mineral resources, the world's most important fishing banks are located in the waters around the Arctic. As the temperature of the sea surface rises due to global warming, there is growing interest in the marine products industry from countries around the

Figure 1. Estimated Oil and Gas Reserves in the Arctic



Source: "Circum-Arctic Resources Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle," *U.S. Geological Survey*, <http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf> (accessed January 30, 2018).

Arctic Ocean. The Arctic fisheries occupy five percent of the global fish caught from the sea. Most Arctic residents are engaged in fishery and fish processing industries. The main fishing grounds of the Arctic Ocean include the southern coast of Greenland, the Barents Sea across the Svalbard and Nova Zembla, the North Atlantic Ocean and the Bering Sea, and the northern coast of Alaska.²⁰

Arctic Development Policy and Features under Vladimir Putin's Presidency

As Arctic sea ice is declining at a rate of four percent per decade, the possibility of using the international sea route throughout the year is increasing due to the expanded use of new sea routes (Northeast Passage and Northwest Passage). In fact, it was at the time of Mikhail Gorbachev that Russia resumed large-scale development of the Arctic and the Arctic Route. In October 1987, Gorbachev held a speech in Murmansk and called for an Arctic Peace Zone at the end of the Cold War. In the Murmansk Initiative, Russia emphasized the need to mitigate military confrontation in the Arctic region and proposed transnational cooperation for the denuclearization of the Arctic, restrictions on military activities of the Soviet Union and the United States, environmental protection, resource development, the opening of the Arctic Route, scientific exploration and problem solving for the Arctic residents.²¹

After the comments on the commercial use of the Arctic Route in the Murmansk Initiative declaration, the "Rules of Navigation for the Northern Sea Route" were resumed to develop the Arctic Route in 1991. These rules defined how the Arctic Route has been developed into the national arterial route and the Russian territorial waters and maritime economic zone. After that, full-scale discussions were conducted regarding the positions and activities of Arctic coastal states, the activities of non-coastal states and the protection of the Arctic environment in Stockholm, Sweden in March 1988 and Finland in January 1989.²² Despite the international opening of the Arctic Route after the collapse of the Soviet Union, the Murmansk declaration did not exert significant influence due to Russia's financial difficulties in the early 1990s. It was suggested as an alternative policy of the Putin government to overcome the economic difficulties that Russia faced through the natural resources of the Arctic. From 1993 to 1999, the International Northern Sea Route Program (INSROP) was carried out to develop waterways, conserve the natural environment and evaluate pollution impact and economic feasibility due to the opening of the marine transportation route. In 1997, Russia signed the UN Convention on the Law of the Sea and applied for additional sovereignty over the areas of the Arctic for the first time. In September 2006, the Northwest Passage, which connects the Atlantic and Pacific Oceans along Alaska and the Arctic coast in northern Canada, was first opened, and seven routes were opened by 2008.²³

In 2007, the Mir-1 submarine of Russia's continental shelf exploration team planted a rust-proof titanium Russian flag 4,302 meters deep into the bottom of the Lomonosov Ridge. Russia claimed that the Lomonosov Ridge in the Arctic Circle is connected to the Chukotka Peninsula on the eastern side of Siberia and submitted an application

for the ownership of the continental shelf to the UN Commission on the Limits of the Continental Shelf for the Lomonosov Ridge to be recognized as Russian territory. In mid-September 2008, Putin confirmed the Russian Federation Strategy 2020, the strategy for the socio-economic development of the Arctic zone of the Russian Federation for the period until 2020. In this strategy, the Sakha Republic of Russia, Murmansk and Arkhangelsk, Krasnoyarsk, Nenets autonomous district, Yamal–Nenets autonomous district and Chukotka autonomous region were all included as administrative entities.²⁴ Russia is also focusing on the development of ‘international ports’ in the Arctic to promote the efficient use and activation of the Arctic Route. In June 2012, Russia announced a law related to government regulations on ship navigation in the Arctic Sea Route areas. This law included the guarantee of Russia’s national interests in relation to the Arctic Route, the operation of the country’s intensively integrated Arctic route navigation system, the provision of icebreakers and the right to equal access to vessels using the Northern Sea Route, including foreign vessels.²⁵

Russian president Vladimir Putin continued to extend the 2013 Russia Arctic Development Strategy to 2025 and found the Department of the Far East & North Pole. Russia has designated 150 projects for this development and announced plans to invest five trillion rubles over the next several years. Of this, one trillion rubles will be supported by the government budget, and four trillion rubles will be financed by external investment. Based on the development potential of the Arctic region of Russia, Russian Deputy Prime Minister Dmitry Rogozin set up an Arctic Development Committee to actively promote socio-economic development of the relevant regions, scientific technology development, information and communications infrastructure, environmental protection and international cooperation (see Table 2).²⁶

Based on the above, projects are underway according to “Russia’s Arctic Region Development,” which is a draft of Russian Federation law, to construct a base area in the north of Russia. In mid-October 2016, Russia announced transportation projects such as the transportation the hub project of Murmansk. In particular, the development of the Kola base area in the north of Russia is centered on a transportation project, and 36 projects were selected in a related move. The government program, titled “Prospects of Socio-Economic Development in the Arctic Region of Russia for 2020 and Beyond” was included in part of the projects. The main contents of this project are the construction of a seabed terminal for the transshipment of coil and coil-related cargos and containers, and the establishment of plans to create a suitable environment for increasing passenger transport. It is expected that through this project, it will be possible to reconstruct the ferry terminal and Murmansk Port as well as anchor large cruise ships.²⁷

Table 2. SWOT Analysis of Russia's Arctic Development Potential

Strengths	Weaknesses
<ul style="list-style-type: none"> - Development possibility of natural resource-related industries - Low labor wages - Geological location that facilitates international cooperation in the fields of transportation and logistics - Improvement of energy efficiency and replacement, favorable conditions for development of renewable energy - Development of society, economy and environmental infrastructure in the Arctic region, international cooperation in a complex world and high investment attractiveness 	<ul style="list-style-type: none"> - Community's low market adaptability - Absence of transportation, energy, industry and service infrastructure - Low labor productivity - Population reduction problem - Inadequate response to future climate change
Opportunities	Threats
<ul style="list-style-type: none"> - Skilled migrants' economic participation and educational system for workers with stable employment - Establishment of technology, social culture, financial innovation international center and business incubator and industrial clusters underway - State programs for the promotion of international cooperation investment from foreign countries and development of related industries 	<ul style="list-style-type: none"> - Outflow of talented personnel in the Arctic region into other areas in Russia and outside the country - Worsened residential environment of indigenous peoples - Uncertainty resulting from climate change due to global warming - Environmental pollution and destruction due to resource development

Source: Kim Deok-hoon, "Status of Russia's Arctic Region Development—the Northern Sea Route and Natural Resource Development Field, Korea–Russia Economic Cooperation Prospects," cafe.daum.net/ktrc21/TZE5/1698 (accessed July 20, 2019).

In early February 2017, Russia set up a budget of 209 billion rubles for the "Revised Program for the Social and Economic Development of the Arctic Zone until 2020." Deputy Minister of Economic Development of the Russian Federation Aleksandr Tsybul'sky said, "The construction of a new nuclear icebreaker 'the Leader,' installation of equipment for recovering the sunk nuclear facilities, continental shelf development project, development of new technologies for the Arctic development, environmental monitoring, implementation of information policies and plans to support indigenous people." This program is implemented through public and private partnerships that take into account the needs of all concerned parties, including business communities and local residents, in order to build infrastructures such as an implementation period, responsible departments, task and financing size. The Ministry of Economic Development of the Russian Federation has paid attention to eight regions, including Kola, Arkhangelsk, Nenets, Vorkuta, Yamal–Nenets, Taymir–Turukhansk, North Yakutia and Chukotka, as key drivers for Arctic development.²⁸

Methods to Activate the Arctic Route and Construct a Complex Logistics System

The Arctic coastal states have used the Arctic Route as a marine route for cargo transport for over 100 years. However, navigation on the Arctic Route was limited due to a lack of transportation links with other alternative routes as well as economic and safety reasons. However, the level of vessel navigation has increased due to Arctic resource development and logistics transportation.²⁹ Other routes using icebreakers are connected in the Arctic direction on the coast of Greenland and the northern coast of Norway. Since 2008, the Arctic Route has started to open. The navigation on the Arctic Route has tended to increase steadily since the first commercial navigation of merchant ships belonging to Beluga Shipping, a German heavy-lift shipping company, in 2009.³⁰

Despite the many constraints, the navigation of vessels in the Port of Busan and the Port of Rotterdam through the Arctic Route can reduce the distance by 32 percent (22,000 kilometers to 15,000 kilometers) when compared to the vessel navigation through the Suez Canal. In addition, the number of navigation days can be reduced from 40 days to 30 days. Therefore, the Arctic Route can save both the time and expenses spent on vessel navigation. Moreover, its value as an alternative route to prepare for emergencies, such as the blockade of the Suez Canal and the Malacca Strait, is expected to increase as the transport of natural underground resources and mineral resources produced in the Arctic and Russia becomes more active.³¹ The main route of the Arctic Route is sea transport, and it runs from Busan and the Russian Far East to the Bering Strait and the Murmansk adjacent to the western Arctic.³² In particular, Murmansk has been in the spotlight due to global warming. According to the Danish Meteorological Institute, the average temperature of Murmansk was minus 25 degrees Celsius in January through March 2017, which has risen about five degrees when compared to minus 30 degrees Celsius in January through March from 1950 to 2002. The geographical advantage of Murmansk has been further highlighted due to the activation of the Arctic Route. This is because the use of the Arctic Route that connects Murmansk in western Russia to Kamchatka in eastern Russia can reduce the travel distance to two-thirds of its distance through the Suez Canal, making it advantageous for Russia to transport its chief exports such as oil and gas to Asian countries. In 2017, the volume of logistics transport in the ports of Murmansk increased by 49 percent from a year earlier.³³

Russia is currently exploring ways to prepare for an increase in cargo traffic through the Arctic Route and a growing need for a structure capable of “year-round navigation.” In particular, Russia is investing funds in a comprehensive approach to securing information on waterways, hydro-meteorology and maps and strengthening measures to prevent oil spills. It is also calling for cooperation between the government and companies in the development of a nuclear-powered icebreaker fleet. In the National Committee on Arctic Development held at the Port of Sabetta in June 2017, Russian Deputy Prime Minister Dmitry Rogozin stated that the task of creating a new icebreaker fleet in a difficult economic situation must be done in cooperation between business and the government, and Russia is looking for a feasible method.³⁴

Russia is now striving to develop multi-purpose ports at the national level for the development of the Arctic Route and construct a railway system to develop a Northern Sea Route connecting the inland and the ocean.³⁵ This is because methods to procure energy mined in the Arctic region and logistics can be efficiently constructed through the system. The repair works for the transportation infrastructures of land, sea and air are closely linked with the Arctic development and the Northeast Sea Route through the complex logistics system.³⁶ The Russian Academy of Sciences has announced that its major transport materials include LNG, petroleum, and coal and metals, and it will be able to transport 40 million tons of cargo by 2022. It has also estimated that by 2025 the quantity of goods to be transported through the Arctic Route from the Barents Sea to the Chukotka and Bering Sea would increase to 75 million tons.³⁷ In this context, it is expected that the volume of transportation along the Northern Sea Route will increase to 70 percent for oil and gas, 10 percent for bulk cargo, six percent for container cargo, six percent for nonferrous metal, four percent for iron ore, and four percent for wood in 2020. It is also predicted that most of the seas in the Northeast Passage and the Northwest Passage of the Arctic Route will be ice-free from 2040 to 2059, and only some of the sections of the route through the North Pole and the Northwest Passage will be navigable with Polar Class 6 (PC6) ships with moderate ice-breaking capabilities. In the future, the Arctic Route will be developed into a combined logistics system linked with air traffic, railways, roads and river transportation.³⁸

Russia is now pushing forward with a railway and road construction project to activate the Arctic Route. The most important logistics infrastructure to be constructed includes “Belkomur (White Sea–Komi–Ural)” and “Northern Latitudinal Route (СНХ).” These logistics projects are included in 17 core Arctic development projects, and each project will cost about 250 billion rubles. When the Northern Latitudinal Route is established, millions of cargo can be transported in the Ural and Volga regions, and the Siberian region is connected to European and Asian markets. In addition, the development of hydrocarbons is expected to be active at the center of the Yamal–Nenets autonomous district, and oil and gas companies’ logistics costs will decrease greatly.³⁹

Conclusion

The Arctic still has many problems such as low population densities due to unfavorable climate and geographical conditions, conflicting interests between countries concerned with Arctic development, competition for military capabilities between the United States and Russia, possibility of losing future drinking water sources due to the contamination of clean waters through the activation of the Arctic Route. However, the world is likely to continue developing the Arctic since the development potential of the Arctic region is high in terms of Arctic resources and logistics.

The Arctic Route to be opened around 2030 is expected to contribute to the increase of logistics and the development of shipbuilding and plant industries, which is comparable to the Suez Canal and the Panama Canal. The developed Arctic Route

will be used for the development of resources such as oil and natural gas on the coasts of the Arctic Ocean and transportation of materials in the short run, and it will play an important role as the shortest maritime route for the transport of goods in world trade that connects Europe, Asia and the west coast of North America in the long run. The Northern Sea Route has special significance at the global level because it can not only serve as a basic arterial road for transportation that connects the Arctic region of Russia and other regions, but also can reduce the distance between Europe and the Asia–Pacific region.⁴⁰ Therefore, it is expected that the active commercialization of the Arctic Route will shorten distances and the navigation period, decrease container freight transportation costs by 25 percent and make advancements in industrial fields such as the off-shore plant industry.⁴¹

To expand the use of the Arctic Route, which gives rise to the possibilities of resource development and commercial opening, Russia needs to secure icebreakers, expand social overhead capital such as roads and harbor facilities and develop Far East seaports to solve the Far East port-shortage problems. Despite some constraints mentioned earlier, Russia has concentrated its energy on the use of the Arctic Route, which gives rise to the possibilities of resource development and commercial opening. In the medium to long term, the Arctic Route is expected to become a very important strategic transportation point due to the development of huge amounts of oil and gas in the Arctic continental shelf. Due to expanded possibilities of mining oil, gas and other mineral resources, Russia, which is the largest Arctic state, is now concentrating its efforts on developing the natural resources of the Arctic, constructing infrastructure and establishing a combined logistics transportation system. To foster the economic growth of the northernmost area and the Far East region, Russia seeks to promote the development of Arctic resources and the activation of the Arctic Route as its priorities.

In a related move, Russia is currently working to develop the Far East port for securing icebreakers, expanding social overhead capital facilities such as roads and ports and solving the problems resulting from a congestion of goods. The Arctic Route to be opened around 2030, which is comparable to the Suez Canal and the Panama Canal, is expected to contribute to an increase of logistics and the development of shipbuilding and plant industries.⁴² In addition, as the possibility of commercialization of the Arctic Route increases, it will be used as the shortest sea route that connects Europe, Asia and the western area of North America in the medium and long term. Russia has 36 icebreakers and operates the world's only nuclear-powered icebreaker fleet with four ships. In addition, Canada, the United States and Germany already have icebreakers, and China and Japan are now building icebreakers.

In early June 2017, the naming ceremony of the world's first icebreaking LNG carrier *Christophe de Margerie* took place under the leadership of President Putin. This carrier was the first icebreaker ever built by Daewoo Shipbuilding & Marine Engineering and is the only icebreaker assigned an Arc-7 ice class developed for the "Yamal LNG" project. The vessel is manned by a crew of 29 Russian members. It was launched at the end of March 2017, and was in the spotlight as the first to sail Asia and Europe without the help of icebreakers. In early July of the same year, Daewoo Shipbuilding & Marine

Engineering secured about 240 billion won in funds by delivering an LNG icebreaker to a Russian shipping company. This vessel is the world's first LNG icebreaker built by Daewoo Shipbuilding & Marine Engineering and can sail in the polar region by breaking ice up to 2.1 meters in thickness. The vessel is 299 meters long and 50 meters wide and can transport LNG that can be used for two days in Korea. By 2020, 14 icebreaking LNG carriers will be delivered to Russia.⁴³

The Ministry of Trade, Industry and Energy announced that it plans to carry out Arctic LNG-2 as a joint research project on gas pipelines from October 2018. Its plan is to diversify the portfolio of gas introduction through the participation of Russia promising the LNG project and the connection of gas pipelines between Korea and Russia.⁴⁴ The two countries have been consulting on strengthening sustainable Arctic cooperation through the Korea–Russia Arctic Consultation established in November 2017. In particular, the 3rd Korea–Russia Arctic Consultation was held in Seoul on July 3, 2019. The two countries could look into cooperation between Korea and Russia in major fields related to the Arctic such as the Arctic Route, resource development and shipbuilding among nine sectors (gas, railways, ports, power generation, Arctic Route, shipbuilding, agriculture, fisheries, and industrial complex) of the 9-Bridge Strategy pushed ahead by the Korean government. In addition, they discussed ways to cooperate in the Arctic-related international conferences, including the Arctic policies, shipbuilding and marine transport, scientific cooperation, and the Arctic Route and Arctic Council (AC).⁴⁵ As a result, the maximization of the effect from the upper hand on various projects in the Arctic region through continuous resource development between Korea and Russia, logistics, LNG icebreakers and construction plants will ensure that Korean companies will generate high-level performance and results when participating in projects in the longer run. That is, companies will be able to contribute to the creation of jobs through participation in facility provisions and system construction in the fields of shipbuilding, aerospace and information and telecommunications in addition to Arctic resource development.⁴⁶

Lastly, policies for Arctic development should not focus solely on “development” in the Arctic. That is, geopolitical and geo-economic characteristics as well as the constraints of the Arctic region should be considered in terms of “protection.” In this respect, the main objective of international cooperation is to pursue a two-track policy for “development and protection.” In order to effectively achieve this goal, there is a need to establish global governance of the Arctic region through international cooperation, promote the commercialization policy of the Arctic Route and cooperation with related countries, and explore policy measures with non-coastal states. In addition, it is necessary to conduct research and train experts at an international level to aggressively advance into the Arctic region.

Notes

1. The Arctic is a polar region characterized by extremely cold temperatures, where the average temperature is less than or equal to 10 degrees Celsius (approximately 50 degrees Fahrenheit) in July. The indigenous peoples of the Arctic include the Saami residing in the circumpolar areas of Norway and Sweden, the Komi in Russia, Yakuts or Sakha in Russia, the Inuit in northern Alaska, Canada and Greenland, and the Yupik in western Alaska and Russia's Far East.
2. Yoo-min Lee, "Arctic Changes Requiring Complex Response Capabilities," *Energy Economy*, February 26, 2018.
3. The Arctic issues are discussed at the Arctic Council, which consists of eight member states with territories in the Arctic Circle, 13 observers, including Korea, and six local groups.
4. At the time of establishing the Arctic Joint Strategic Command, Russian President Vladimir Putin said that he was planning two specialized brigades that can carry out operations in the Arctic region. "OOCK 'Север,' Arctic Joint Strategic Command Undertook Its Operations," *Russia Focus*, December 14, 2014.
5. Russia has secured 14 runways, 16 naval ports and 40 icebreakers on the coast of the Arctic Ocean. It has also organized four special troops to carry out the Arctic operations. In addition, the Arctic military base of the former Soviet period is being rebuilt. In August 2018, Russia deployed missile forces in Tiksi, which is a stopover in the Arctic Route. A large military base, which is five times the area of Yeouido, was built in Franz Joseph Land located at 80 degrees north.
6. Relevant previous studies include: Donald Rothwell, *The Polar Regions and the Development of International Law* (UK: Cambridge Univ. Press, 1996); Gail Osherenko and Oran R. Young, *The Age of the Arctic: Hot Conflicts and Cold Realities* (Cambridge University Press, 2005); Kim Hyun-soo, "Legal Issues on the Limits of the Continental Shelf in the Arctic Ocean," *Ocean Research* 22, no. 1 (2007); Lee Sung-kyu, "Status and Prospects of Arctic Resource Development," *Korea Energy Economics Institute Research Report*, 2010; Kathrin Keil, *The EU in the Arctic 'Game'—The Concert of Arctic Actors and the EU's Newcomer Role* (Berlin Graduate School for Transnational Studies, 2010); Kim Ki-soon, "Resource Development and Environmental Issues on the Arctic Ocean," *Dokdo Research Journal* 9 (2010); Lee Seong-woo et al., *Shipping & Port Condition Changes and Throughput Prospects with Opening of the Northern Sea Route* (Korea Maritime Institute, 2011); Yoo Joon-koo, "Current Issues and Problems of Arctic Ocean Governance," *Analysis of Major International Issues, Korea National Diplomatic Academy*, 2012; Koh Sang-mo, *Prospects of Mineral Resource Development in the Arctic Circle (Greenland)* (Korea Institute of Geoscience and Mineral Resources, 2013); Robbie Andrew, "Socio-Economic Drivers of Change in the Arctic," *AMAP Technical Report*, no. 9, 2014; Yun Ji-won, "Changing Environments of the Arctic Region and Korea's Arctic Policy," *Institute for Northeast Asia Research* 31, no. 1 (2016); and so on.
7. In 2017, the Korea's first icebreaker Araon carried out the North Pole exploration twice and observed a decline in the Arctic sea ice and massive methane emissions. Han Jong-man, "Potential Space of Growth Engine for Future Korean Society: Russia Siberia and the Arctic Circle," in *Arctic, a Space for Korea's Future Growth* (Seoul: Myoung Ji Publishing Co., 2014), 13–14.
8. Han Jong-man et al., *Understanding of the Russian Arctic Circle* (Seoul: Shinasa, 2010), 232. Countries such as Iceland, Greenland, Canada, Alaska, Russia, Finland, Sweden and Norway exercise sovereignty over these territories. <https://goo.gl/b4RJH3> (accessed February 4, 2018).
9. Greenland belongs to the territory of Denmark, the Svalbard archipelago the territory of Norway, and Franz Josef Land the territory of Russia.
10. Kim Deok-hoon, "Status of Russia's Arctic Region Development—The Northern Sea Route and Natural Resource Development Field, Korea–Russia Economic Cooperation Prospects," December 27, 2017, <http://cafe.daum.net/ktrc21/TZE5/1698> (accessed July 20, 2019). [in Korean]

11. In general, “Arctic-5” is called the “High North,” and areas including Sweden, Finland and Iceland in the Arctic Circle is called the “Circumpolar North” in terms of the Arctic political/administrative unit. Han Jong-man, “Analysis of 83 Federation Subjects in the Russian Federation: Focusing on 9 Krays,” *Russian Regional Information Magazine* (Institute of Russian Studies, Hankuk University of Foreign Studies), no. 1, 2010, 27.
12. Korea, China and Japan have been working to join the Arctic Council since 2008. In 2013, the three countries were granted observer status with the Arctic Council. In 2014, the North Pacific Arctic Research Community (NPATC) was founded at the suggestion of Korea, and it is expected to serve as a collaborative platform for expanding the roles and participation as observers of the Arctic Council.
13. Oran R. Young, “Foreword—Arctic Futures: The Politics of Transformation,” in *Arctic Security in an Age of Climate Change*, ed. J. Kraska (New York, NY: Cambridge University Press, 2011), xxii.
14. Koh Sang-mo, “Prospects of Mineral Resource Development in the Arctic Circle (Greenland),” *Institute of Geoscience and Mineral Resources*, February 15, 2013. In early September 2010, Korea signed four MOUs with Greenland on cooperation for resource development. Donald Rothwell, *The Polar Regions and the Development of International Law* (Cambridge, UK: Cambridge Univ. Press, 1996); and “Oil and Gas Resources of the Arctic,” *Russian Analytical Digest*, No. 96, May 12, 2011, 7.
15. *Arctic Strategy*, Washington D.C., May 10, 2013, 17.
16. Valery P. Pilyavsky, “The Arctic: Russian Geopolitical and Economic Interests,” *Briefing Paper*, March 2011, 1.
17. *Moscow Resource*, June 2, 2017.
18. <http://ru.arctic.ru/resources/20170329/582399.html> (accessed October 2, 2017).
19. Staff Writers, “Russian Arctic Resources,” *Voice of Russia*, August 30, 2012.
20. Charles Emmerson, *Arctic Opening: Opportunity and Risk in the High North* (Chatham House, 2012), 27.
21. Michael S. Gorbachev, “The Speech in Murmansk at the Ceremonial Meeting on the Occasion of the Presentation of the Order of Lenin and the Gold Star Medal to the City of Murmansk,” Novosti Press Agency, October 1, 1987, 23–31.
22. Yun Yeong-mi, “Disputes in the Arctic Ocean and Changes in Geopolitical Dynamics—Russia’s National Strategies in the Arctic Ocean and Countermeasures,” *Korean–Siberian Studies* 14, no. 2 (December 2010): 1–10.
23. Kim Bo-yeong, “A Study on the Climate Change and the Policy of Natural Gas Exploitation on the Arctic Region,” *Environmental and Resource Economics Review* 18, no. 4 (2009): 792.
24. *The Journal of Arctic*, no. 9 (2017): 36.
25. The largest city in the Arctic Circle is Murmansk, which was a major military port for Russia’s navy during the Soviet period. A population of 500,000 in the Soviet period has recently dropped to 300,000. This has led to a change in the tourism industry of the Murmansk region. The Russian government has formulated its policy to attract tourists to Murmansk to enjoy winter sports and observe the Aurora.
26. *Moscow Resource*, June 2, 2017.
27. <http://www.arctic-info.ru/news/14-10-2016/kolskaya-zona-delaet-stavku-na-transport/> (accessed October 4, 2017).
28. <http://ru.arctic.ru/infrastructure/20170201/539142.html> (accessed October 3, 2017).
29. Hwang Jin-hoi, “Possibilities and Challenges of Northern Sea Route” (paper presented at the 2010 conference co-hosted by the Research Institute for Social Science and Korea–Siberian Center, Pai Chai University, September 17, 2010), 108.
30. As of 2012, the volume of cargo through the Northern Sea Route was 1.3 million tons, showing a 53 percent increase from 820,789 tons in 2011. Petroleum products (diesel oil, gas condenser, jet oil, LNG and other oil products) accounts for the largest volume, followed by iron ore and coal. With the steady increase in Arctic navigation, the volume of cargo through the Arctic Route increased from four million tons in 2014 to 7.5 million tons in 2016. <http://www.arctic->

- info.ru/news/24-01-2017/vektor-razvitiya-sevmorputi-mozhet-izmenitsya/ (accessed October 3, 2017).
31. <http://blog.daum.net/shbaik6850/16547148> (accessed October 3, 2017).
 32. For a more detailed discussion related to the Arctic Route, see Yun Yeong-mi, "Strategy of Russian Marine Security over the North Pole Region: Focusing on the Development of the Arctic Ocean and the Marine Cooperation between Korea and Russia on the North Pole," *East and West Studies* 21, no. 2 (2009): 65.
 33. *Moscow Resource*, June 2, 2017.
 34. <http://ru.arctic.ru/infrastructure/20170614/627927.html> (accessed October 4, 2017).
 35. Kang Seong-ho, "Environmental Changes and Prospects of the Arctic Ocean" (paper presented at the KMI International Seminar, Seoul, June 13, 2009), 22.
 36. Han Jong-man, "Potential Space of Growth Engine for Future Korean Society: Russia Siberia and the Arctic Circle," 407–44. For a more detailed discussion on Russia's policy towards the Arctic Route, see the following. Yun Ji-won, "Geopolitical Characteristics of the Arctic and International Cooperation," *Military Studies*, June 30, 2018, 425–46.
 37. <http://ru.arctic.ru/infrastructure/20170620/632777.html> (accessed October 3, 2017).
 38. Rolf Rosenkranz, "The Northern Drift of the Global Economy: The Arctic as an Economic Area and Major Traffic Route," *World Customs Journal*, no. 1 (2010): 25.
 39. *Moscow Resource*, June 2, 2017.
 40. Yun Yeong-mi, *Contemporary Russian Politics and International Relations* (Seoul: DUAM, 2011), 130–31.
 41. For a more detailed discussion about the opening of the Northern Sea Route and shipping ports, Lee Seong-woo et al., *Shipping & Port Condition Changes and Throughput Prospects with Opening of the Northern Sea Route* (Korea Maritime Institute, 2011).
 42. <http://blog.daum.net/shbaik6850/16547148> (accessed October 3, 2013).
 43. <http://ru.arctic.ru/international/20170605/622660.html> (accessed October 4, 2017).
 44. Kim Yeon-suk, "Russia's Gas Development and Introduction Business on the North Pole Accelerates," *Energy Economic News*, October 14, 2018.
 45. With respect to the Korea-Russia Arctic Consultation, agreement was reached at the ROK–Russia summit talks in Vladivostok in September 2017. The Korea–Russia Arctic Consultation was first held in Seoul in November 2017 and has since taken place in the two countries annually on a rotational basis. Next year's meeting will be held in Russia, *Report of the Ministry of Foreign Affairs*, July 3, 2019, 19–448.
 46. news.kotra.or.kr/user/globalBbs/kotranews/4/globalBbsDataView.do (accessed October 16, 2018).

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