

UDC 332.1+330.15

DOI: 10.17238/issn2221-2698.2017.26.24

Foreign and domestic experience of economic development of the Arctic territories



© **Dmitriy A. Matviishin**, postgraduate student, Department of Economics. Phone: +7 (909) 561-22-20. E-mail: bestumik@rambler.ru
Murmansk State Technical University, Murmansk, Russia.

Abstract. The article deals with the key aspects of the Arctic exploration. There is a brief description of the Arctic Council, as well as strategic goals, objectives, activities and resources used of member countries and observer organizations to achieve these goals. The resource base of the Arctic region is studied. The economic analysis of the Arctic territories by circumpolar states, including the characteristics of resource projects, is arranged. The features of the Russian and

foreign approaches to the management of the economy in the Arctic are noted. The method of logical analysis, economic and statistical and historical methods are used in the research. The result is the scientific justification of advantages and potential of domestic experience of development of the Arctic, and also of the necessity of timely adaptation of economic approaches, investment policy and the legislation according to the current challenges and tendencies.

Keywords: *The Arctic, the history of the Arctic exploration, the Arctic strategies, resource base, resource extraction projects, the features of the Arctic development*

Regional development of the Arctic in the XXI century involves the inclusion in the economic turnover not only the territory of the Arctic coast, but also the water areas of the Arctic seas and the Arctic Ocean [1, Burtsev O.V., pp. 17-21], that is, the formation of the foundations of marine civilization within this regional space. Such geoeconomic development of the Arctic contributes to the expansion of Russia's geopolitical space in the traditional direction to the south and southwest [2, Kozmenko S.Y., pp. 46-49].

At the same time, it should be emphasized that the main source of the development of the Arctic region has been, as before, natural resources and, above all, hydrocarbons. The Arctic is a region with severe climatic conditions, which creates additional difficulties in the development of its expanses. The extraction of minerals is associated first of all with the problem of the lack of a proper number of technologies that would allow us to make the environmentally safe management of natural resources. However, every year, scientific and technological progress allows subsoil users to move ever deeper into the North. Understanding the goals, objectives, methods and approaches of different countries to the development of the Arctic territories let us determine the most effective of them, which ensures the use of best practices and the optimization of the whole process in order to form the basic provisions of the strategy for the development of maritime activities and the nature management economy in the Arctic [3, Kozmenko S.Y., pp. 58-63].

Key historical aspects of the study of the Arctic territories

The Arctic territories have attracted humanity since ancient times. According to some sources, the first permanent settlements of the ancestors of modern Saami in the Arctic are dated back to the 3rd-2nd millennium BC. However, in fact, the "studies" of the northern territories began only with the development of the era of navigation in the X–XII centuries.

Approximately from the XVI century the first Arctic expeditions (Willem Barents, William Baffin) started, their goal was the discovery of new sea routes in the North [4, Ksenofontova D.A., pp. 178-179]. At the beginning of the next century, the research continued, and in the north of Western Siberia, at the confluence of the river Mangazeyka in the river Taz, the first Russian polar settlement Mangazeya was founded. In the XVIII century, K.P. and D.Ya. Laptev, S.G. Malygin, V.I. Bering, S.I. Chelyuskin and other researchers, with the support of the Russian Admiralty College as part of seven detachments, carried out a number of expeditions, which resulted in the mapping of virtually the entire northern coastal zone of Russia.

The XIX century was full of English expeditions (Thomas Simpson, John Franklin, George Nars and others), when significant areas of the Canadian Arctic Archipelago were explored and a number of unsuccessful attempts to reach the North Pole were made. At the same time, Austro-Hungarian researchers K. Weiprecht, J. Payer discovered and described Franz Josef Land [5, Potaturov V.A., pp. 290-291].

In 1882-1883 the First International Polar Year was held, when 14 polar stations were organized, 12 of them — in the Arctic. Valuable meteorological, geophysical, biological and anthropological materials were obtained on the results of the Polar year.

At the edge of the XIX-XX centuries the number of studies and discoveries only grew. The ice cover of the Greenland Island (F. Nansen) was crossed for the first time, the Northwest Passage (R. Amundsen) was completely traversed by water, the North Pole (R. Piri) was reached, the Northern Sea Route was conquered (at different times by N. Nordenskiöld, B. Vilkitsky, R. Amundsen).

In 1898 the first icebreaker of the Arctic class "Ermak" built on the order of the Russian Empire was launched. The development of the Arctic airspace began. So, the Russian military pilot Ya.I. Nagursky in 1914 became the first polar pilot in the world. In 1926 (R. Amundsen) and 1928 (U. Nobile) flew over the North Pole on airships in the framework of the Arctic expeditions. In 1937 the Soviet aviators made a non-stop flight over the North Pole from Moscow to Vancouver.

From 1932 to 1933 the Second International Polar Year was held, and the work of more than 100 stations with the participation of scientists from 44 countries were organized. The

program of the Polar year included the study of magnetic storms, ionospheric conditions, meteorological phenomena, auroras and so on.

In 1937, the world's first polar research drifting station "North Pole-1" was opened in the Soviet Union. In 1933 the first icebreaker with the diesel-electric installation "Imer" was built in Sweden. Diesel-electric icebreakers of class "Wind" were built in the United States in 1942-1946. The Soviet Union in 1959 commissioned the world's first nuclear-powered icebreaker, and in 1960 the first domestic diesel-electric one. In 1977, the nuclear icebreaker "Arktika" reached the North Pole for the first time.

In 1957-1958 the International Geophysical Year was held, which is considered to be the Third International Polar Year. Already 67 countries took part in the work of the Polar year. The Soviet and American satellites were launched, radiation belts around the Earth were discovered, discoveries of underwater ocean ridges and discoveries in plate tectonics were made.

It should be noted that in XX century, in connection with the discovery of mineral deposits in the Arctic, a huge potential of the region as a large mineral resource base was discovered. So, in the 40's the Soviet Union began mining of non-ferrous metals on Taimyr and Kola Peninsulas. In the North Sea, Norway started gas production in 1971, and the United Kingdom began oil production in 1975. Since 1977, the development of the Prudhoe Bay field in the USA (Alaska) has begun.

The main areas of the strategic development of the Arctic

By the end of XX century humanity came with understanding of the enormous wealth of the Arctic region with natural resources. Estimates of the volume of mineral resources are constantly being refined, confirming the vast resource base of the Arctic. However, the process of development of these resources is constrained by a number of factors: the lack of technology for working in difficult climatic conditions, the need to preserve the ecology of the region, the unresolved issues of "property rights" in the Arctic territories and their resources.

For interethnic cooperation to coordinate issues related to sustainable development and environmental protection in the Arctic, eight Arctic countries (Canada, the United States of America, Finland, Iceland, the Russian Federation, Norway, the Kingdom of Denmark and Sweden) created the Arctic Council in 1996 — an intergovernmental forum for cooperation and teamwork to solve common Arctic issues. It should be noted that the consideration of military security issues was categorically excluded from the powers of the AC.

Nowadays the Arctic Council has eight member states that founded the organization. Six organizations representing the interests of Arctic indigenous peoples have received the status of

permanent participants. A number of non-Arctic states (France, Germany, the Netherlands, Poland, Spain, the United Kingdom, the People's Republic of China, the Republic of Italy, Japan, the Republic of Korea, Singapore and India) and non-governmental organizations have observer status. The issue of appropriation of this status is accepted by the members of the Arctic Council on the basis of an assessment of the interest of the country or organization in the development of the Arctic, as well as its potential contribution to the work of the AC.

The Arctic Council is not a full-fledged international organization, representing a discussion forum. The work of the Council is carried out within the framework of six main working groups that deal with the issues of the Arctic ecology and its sustainable development, the use of the Arctic marine environment, flora and fauna of the region, its protection from the threats of pollution from accidents. Since 2013, Secretariat of the Arctic Council has officially started working in Norwegian Tromsø, its main tasks are to provide administrative, institutional and agitational functions, as well as general support for the activities of the AC.

Working groups regularly publish the results of comprehensive research in the field of environmental and social problems in the Arctic. On the basis of the Council, important legally binding agreements were signed between its members: The Agreement on Cooperation in Aviation and Marine Search and Rescue in the Arctic signed in Nuuk (Greenland) in 2011 and the Agreement on Cooperation in sphere of readiness and response to marine pollution by oil in the Arctic signed in Kiruna, Sweden in 2013.¹

It should be mentioned that the high interest of states to the Arctic, which arose in the second half of the XX century, is currently intensifying. Thus, it is revealing that, despite the functioning of the Arctic Council since 1996, the signing of the first documents binding to its members took place only at the beginning of the second decade of the XXI century. This can also be judged by the timing of approval of strategies for the development of the subarctic states in the Arctic, which all the members of the AC have now.

Norway was the first of the Arctic powers which published in 2006 the Government Strategy in the northern regions. In 2009, the document was supplemented with the report "New structural elements in the north", which clarified the priorities and directions for the long-term. In 2011, a new strategic document, "The Far North — vision and strategy" was approved, in which the Far North and the Arctic were declared as the country's top priorities. The main provisions of the Norwegian policy are leadership in the scientific research of the North, the development of

¹ Arctic Council — main page (official website). URL: <http://www.arctic-council.org/index.php/ru> (Accessed: 28 September 2016)

mineral and biological resources, the development of the sea transport routes, the recognition of the principles of international maritime law, the creation of a full system of cooperation with the Arctic and Northern European countries, as well as the economic development of the Northern Norway. It is significant that the main factor of the Norwegian policy in the North is the cooperation with Russia.

The strategy of the Russian Federation was approved in 2008 by the document "Fundamentals of the State Policy of the Russian Federation in the Arctic for the period to 2020 and Further Prospects." Subsequently, it was supplemented in 2013 with the "Strategy for the development of the Arctic zone of the Russian Federation and national security ensuring for the period until 2020" and in 2014 with the state program "Social and economic development of the Arctic zone of the Russian Federation for the period until 2020". The key objectives and tasks of the Russian policy in the Arctic include the study of the resource base of the Arctic zone of Russia, the protection of the state border of the country, the preservation of the region's ecology, the implementation of scientific research, cooperation with the Arctic states, etc. One of the key roles in ensuring the realization of Russia's Arctic interests is allocated to the Northern Sea route as a national transport passage.

The US published the Arctic Policy Directive in 2009. The main interests are primarily the issues of internal and external security, as well as the demonstration of maritime power and the expansion of economic presence in the Arctic. It is worth noting the statement mentioned in the document about the willingness to cooperate with other states, but at the same time preserving the right of independent unilateral actions to protect their own interests [6, Bashmakova E.P., pp. 17–18]. The military, "strong-arm" approach of the US to the Arctic is due to a rather weak level of economic development of the region and a backlog from other subarctic countries on many issues, including financial support of scientific research, the state of the icebreaking fleet and so on. This approach is confirmed by the fact that the "Arctic Road Map" for the US Navy, first published in 2009, was already republished in 2014 for the period until 2030, and then updated in 2015.

Canada outlined the main areas of the strategy in the document "Canada's Northern Strategy: Our North, Our Heritage, Our Future" in 2009. These include: protecting the sovereignty of the country by building up a military presence in the Arctic, social and economic development of the North, preservation of ecology and adaptation to climate change. Canada's Arctic strategy is primarily aimed at the sustainable development of the northern territories, despite the presence of a military-political aspect.

The State Strategy of Finland in the Arctic was accepted in 2010. The main issues are the country's security, ecology, economy and infrastructure, the interests of the indigenous population and the activities of international organizations. The creation and use of new technologies for the development of the Arctic, the development of shipbuilding, the forestry and mining industry, the preservation of the country's status as an international arctic expert are important for Finland.

The strategies of Iceland (the Parliamentary Resolution on Arctic Policy), Sweden (the Swedish Strategy in the Arctic) and Denmark (the Kingdom of Denmark Strategy for the Arctic for 2011–2020) were published in 2011. In terms of key provisions, they are similar and note the important role of the Arctic Council as a consultative forum, the need to develop cooperation between the Arctic countries and support the rights of indigenous peoples. They declare the importance of ensuring security in the Arctic by civilian means, adherence to international law, preservation of the ecology and the environment, increased attention to climate change, development of the economy and trade relations, cooperation on scientific issues, search and rescue operations, and prevention of pollution.

A strategic approach to the Arctic is also expressed in official documents and actions taken by European and Asian countries that are not subarctic ones.

The strategic vision of the European Union's policy in the region is reflected in the communiqué "The European Union and the Arctic region" published in 2008. The document affirms the need to consider the Arctic issues by the international community, not just the subarctic states, the control of the European Commission over the processes of delimitation of territories in the Arctic, development of transport infrastructure and sea corridors in the region. The main partners of the EU in the issues of potential development of mineral resources are called Norway and Russia. The official website of the European External Action Service published in 2016 the key objectives and areas of the Arctic policy of the EU. The aims are the protection and preservation of the Arctic, the promotion of sustainable development of resources and the development of international cooperation.²

Germany developed the Arctic strategies in 2013 and France in 2016. The Italian Ministry of Foreign Affairs published a document "Towards the Italian strategy for the Arctic. The National priorities" in 2015, which can be considered as a prerequisite for the development of the official strategy [7, Lagutina M.L., pp. 157–158]. These documents are largely compatible with both the

² EU Arctic Policy — European External Action Service. URL: https://eeas.europa.eu/topics/eu-arctic-policy/418/eu-arctic-policy_en (accessed: 03 October 2016)

EU strategy and with each other: they are united by the main statements about the increasing significance of the Arctic for the world community, the need for rational economic development of the Arctic natural resources considering the climate change and preservation of the region's ecology, the development of scientific research and so on.

The remaining countries that are observers have similar policies for the Arctic, despite the absence of approved strategic documents.

The interests of European countries — the UK, Spain, the Netherlands, Poland — include the development of the energy sector (participation in hydrocarbon production), the possibility of free scientific research (primarily on climate change issues), maritime shipping and bioresources, and military interests.

Asian countries — China, Korea, Japan, India, Singapore — defend the following interests in the Arctic: scientific research (environment and climate change research), economic (participation in development of resources, use of sea routes, shipbuilding and construction of port infrastructure), geopolitical (including the improvement of international law) and military ones [8, Zhuravel V.P., pp. 113–141].

The economic development of the Arctic by the subarctic states

The resource potential of the Arctic region primarily contributes to the development of strategic approaches to the development of the region despite the importance of geopolitical, climatic, environmental and scientific research issues.

Currently large reserves of hydrocarbons have been discovered in the Arctic, as well as metal ores, coal and other minerals, and significant biological resources. According to the conducted research, the explored reserves of hydrocarbons in the Arctic make up 233 billion barrels of oil equivalent (o.e), the estimated volume of unexplored reserves is about 413 billion b.o.e. Total — 646 billion b.o.e., which is about the fifth part of the world's hydrocarbon reserves, while 73.8% of this volume falls on natural gas. It should be noted that 65% of oil (without gas condensate) in undeveloped reserves is accounted for by the North American Arctic zone, 17% — by the Russian Arctic. About 70% of unexplored gas reserves are concentrated in the Arctic zone of Russia. World Energy Agency study noted in 2009 that from 61 opened oil and gas fields, 43 are in Russia, 11 in Canada, 6 in the United States and 1 in Norway. At present, about 10% of oil and 25% of natural gas from the world level are extracted behind the Arctic Circle [9, Shvets N.N., pp. 61–63].

Large reserves of coal, copper, nickel, gold, wolframite, iron, and uranium are concentrated in the Arctic. In the north of Russia, the deposits of the following minerals are developed: copper,

nickel, cobalt, apatite concentrates, zirconium, phosphorus on the Kola Peninsula; In Western and Central Siberia — gold, nickel, molybdenum, zinc, coal, diamonds; In the Republic of Sakha (Yakutia) — diamonds (about the quarter of the world's mining), tin, gold. In Canada (Yukon) gold, quartz and coal are mined. The United States (Alaska) develops coal, lead and zinc. Coal, zinc, silver, cryolite, lead and marble are mined in Greenland, and Norway is the largest producer of magnesium and aluminum in Europe [10, Selin V.S., pp. 28–53].

The biological resources of the Arctic are also significant. About 20% of fresh water is concentrated in the region, the flora and fauna here are unique, and large populations of commercial fish live in the seas.

According to experts, about half of the unexplored US oil reserves (approximately 30 billion barrels) are concentrated in the state of Alaska on the territories of the National Oil Reserve and the National Arctic Reserve, as well as on the continental shelves of the Beaufort Sea and the Chukchi Sea. In 1977 the development of the Prudhoe Bay deposit in the borough of North Slope began. The companies Sohio, Exxon and Arco produce about 8% of the oil from the national average in Prudhoe Bay, which is transported along the Trans-Alaska oil pipeline, almost 1,300 km long, to the port of Valdez on the southern coast of Alaska, from where it is delivered by oil tankers to oil refineries in the United States. The infrastructure of the pipeline can be used in the future to transport oil extracted in the Beaufort Sea. In borough Northwest Arctic since 1987, the Red Dog mine is being developed with the largest reserves of zinc in the world. Here, about 10% of zinc from the level of global production is extracted, as well as lead. According to the US Census, the number of people living in Prudhoe Bay varies between 2000–10000 people, depending on season. Almost all residents of the settlement are engaged in the production of hydrocarbons, living in Prudhoe Bay with long alternating shifts. The work of the Red Dog mine is provided by more than 630 people.

Important hydrocarbon deposits in Canada are found in the Mackenzie Delta region, the Beaufort Sea basin and the Canadian Arctic Archipelago. The most active development of these resources was carried out in the 70–80's of XX century, supported by rising oil prices and government support. Since that time about 90 wells were drilled in the Beaufort Sea, about 37 wells — on shelf.

After a significant break at the end of the first decade of the XXI century, the volume of geological exploration started to increase, including those carried out by Chevron and Statoil. Since 1997, Exxon Mobil has been producing oil at the Khyberniya field in the east of Newfoundland. In the same area, the development of Terra Nova and White Rose deposits is

being carried out — oil is extracted using a floating, storage and unloading (FPSO) vessel. Personnel is involved in shifts to work on oil platforms and vessels.

Geological exploration of oil fields in Greenland in the 70's of the XX century showed no prospects for profitable production. Only in 2010, Cairn Energy first discovered hydrocarbons, prompting Greenland to issue the first licenses for exploration of gas and oil fields offshore purchased by Cairn Energy, Shell and Statoil. However, despite the significant probable potential of the region, oil production is restrained by its high costs with reduced prices for petroleum products. Geological exploration of diamond, zinc, molybdenum and gold deposits is also carried out in the region.

The extraction of hydrocarbons in Norway is carried out mainly on the continental shelf in the Northern, Norwegian and Barents Seas. The main volume of the exploration work since the 80's. of the XX century is carried out by Statoil. The largest deposits are the developed fields of Heydrun (since 1995) and Snøhvit (since 2007) and promising ones are: named after Juhan Kastberg (renamed Skrugard and Havis), Ormen Lange and others. As the deposits are in the water area of the seas, oil products are extracted mainly using oil platforms. The Italian company Eni in cooperation with Statoil in 2016 began oil production in the Barents Sea with the help of the world's largest offshore oil platform Goliath. The functioning of oil platforms is provided by labor resources working in shifts.

Since the late 40s. of the XX century, sulphide copper—nickel ores are mined on Taimyr Peninsula. The Polar division of Norilsk Nickel stably holds the world's first places to produce palladium and nickel, and produces platinum, cobalt and copper. Norilsk residents are working in factories and concentrating factories — the most northern city with a population of more than 150 thousand people. Large reserves of iron and copper-nickel ores, aluminum and rare metals, nonmetallic and mining chemical raw materials are discovered on Kola Peninsula. The extraction of minerals began already in the first half of the XX century. The largest companies extracting natural resources are JSC Kola MSC (nickel, copper, cobalt concentrate), JSC Olkon (iron ore concentrate), JSC Apatite (phosphate raw materials) and JSC Kovdorsky MPW (apatite, baddeleyite and Iron ore concentrates). These enterprises are city-forming for the cities of Apatity, Monchegorsk, Kirovsk, Olenegorsk, Kovdor, Zapolyarny and Nikel.

The largest oil and gas bearing regions in the Russian Arctic are the East Barents, South Kara, Laptev, East Siberian and Chukotka Autonomous Region. At the same time, main volume of the hydrocarbon reserves is concentrated in the western sector of the Arctic zone of Russia, and the undiscovered reserves of the eastern sector are mainly classified as conditional and inferred.

One of the largest gas-condensate fields in the world is discovered on the shelf of the Barents Sea — Shtokman, which reserves are 3.9 trillion m³ of gas. The development of the field was planned by Gazprom together with Total and Statoil. However, now the project is suspended due to changes in the world gas market.

Based on South Tambey field on Yamal peninsula, the Yamal LNG project is being implemented, which provides the production of up to 16.5 million tons of LNG per year when it reaches its full capacity in 2019. The project operator is a joint venture NOVATEK, Total, CNPC and Silk Road Foundation. The transport infrastructure is created as part of the project in the region, as well as the infrastructure of the Sabetta field camp (with a peak number of employees of up to 15,000 people). NOVATEK is also developing other deposits in the region with the aim of the subsequent planned launch of a series of three projects Arctic LNG.

In the south-east part of the Yamal Peninsula, Gazpromneft is producing Novoportovskoye oil deposit, with recoverable reserves of more than 250 million tonnes of new sort oil Novy Port. Transportation of raw materials is carried out by pipeline to the coast of Gulf of Ob, where further shipment is arranged with the help of the Arctic oil terminal "Gates of the Arctic" to tankers carrying out subsequent transportation by sea. Work of the personnel within the framework of the project is carried out on a shift basis.

Conclusion

The territory of the Arctic was initially developed regarding commercial and, less often, trading interests. Since the XVI century the first research expeditions began to determine which territories were in the North, and whether navigation was possible there. With the course of time, the scientific interest of expeditions intensified. Mariners and researchers set more and more ambitious goals, and closer to the end of the XIX century the competition for achievements in the Arctic between representatives of different countries began. Technological breakthrough of the XX century allowed to significantly accelerate the pace of exploration of the Arctic and opened the raw material potential of the region.

The development of the natural resources of the Arctic began in the first half of the XX century, but the active growth of this process occurs only from the end of the XX century to the beginning of the 21st century. The largest share in the structure of extracted minerals in the Arctic zone is occupied by hydrocarbons. Other mineral resources are also mined in the region, including metal ores, coal, nonmetallic and mining chemical raw materials. The use of new technologies, profitability of extraction, safety for the environment can be called as the main principles of the integrated approach to the development of the Arctic resources.

Relating to the growing interest to the Arctic region, primarily because of its resource potential and the impact of climate change, the world community in the late XX — early XXI centuries began to give the Arctic more and more attention. The subarctic states have established international organizations to jointly solve key issues in the region. Following their own interests, the countries remoted from the Arctic become participants in the work of these organizations. To realize their interests, states develop the Arctic strategies that contain information on the main goals, tasks, activities, resources used to achieve them, and so on. The main issues on the agenda are the issues of economic development of the Arctic in difficult climatic conditions with the need to preserve the ecology. And the lack of industrial technology and climate change are incentives for the development of scientific research.

Most of the subarctic states consider the development of the Arctic as one of the strategic goals, including the social and economic well-being of the region's population. The economic development of the Arctic territories has already been implemented by all these countries. The greatest experience in conducting economic activities in the Arctic was made by the Soviet Union (which was the first in the 1940s which started mining operations in the region) and its successor, Russia. The remaining subarctic states joined this process only in 1970s – 1980s. At the same time, only Canada among them initially led the "civil" development of the Arctic space, and for the United States and European countries the provision of a military presence in the Arctic was the initial goal. The USSR deployed military forces in the region in parallel with its economic development.

The Russian Federation, in addition to extensive experience in the development of Arctic fields, has considerable experience in operating the icebreaking fleet (the largest), including the world's only nuclear icebreaking fleet.

it is revealing that about half of the population of the Arctic zone lives on Russian territory. This is largely due to the legacy of the Soviet approach to the development of the Arctic associated with the foundation and development of single-industry towns inhabited by the labor force permanently residing on the territory to ensure the mining of minerals and the functioning of military bases. The countries of Europe and North America (primarily Canada) mainly use the principle of "development without settling", when the development of deposits is provided by the shift method, and only the indigenous population in the Arctic resides there permanently.

Thus, the domestic experience of conducting the Arctic economy has the significant advantages and reflects the high competitive potential of the Russian Federation. However, the preservation of these advantages over the western countries is possible only with the timely

adaptation of approaches to the development of the Arctic, investment policy and legislation in accordance with current challenges and trends, as further advance to the north will be provided primarily through the modernization of existing production processes and the discovery of fundamentally new technologies.

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