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ROLE OF "GREEN" LOGISTICS IN PROVIDING ECOLOGICAL SAFETY OF ARCTIC RESOURCES: SOCIAL AND ECONOMIC ASPECT

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Abstract: *This article is a review of basic logistic and technological solutions that must be implemented to rationalize surface management in the European Arctic. On the basis of stating the article materials, the following conclusions were obtained:*

- *The Arctic Regions are the world heritage and "climate laboratory" of the planet. That is why the reclamation of the resourceful, industrial and transportation and logistics potential of this region must be based on "green" technologies,*
- *At the present time reserves of hydrocarbon resources concentrated in the European Arctic cannot be extracted without consequences of ecological nature. The access to these resources is limited because the transportation component is not developed,*
- *The Arctic Regions have a considerable transportation and logistics potential whose reclamation is also obstructed due to objective circumstances (underdevelopment of the infrastructure, severe climate conditions, etc.) and due to the fact that traditional logistics can make greater ecological damage to the Arctic eco-system, and*
- *The article considers four ecologically-focused areas (formation of the material and technical base, establishment of the safe icebreaking fleet, development of new systems of navigation and communications, and power supply) that will allow to reclaim industrial and transportation and logistics potential of the Arctic Regions with the minimum technogenic loading.*

Keywords: *"green" logistics, "green" economy, European Arctic, transportation and logistics potential, ecological safety.*

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1. INTRODUCTION

The latest 50 years of the modern civilization development have showed that economic and ecological context has to be harmonized in order to transfer from the "brown" (resources wasteful) trend (Ban Ki-moon 2014) to "green" (resources efficient) trend of evolution. Otherwise the modern world should be on the threshold of the ecological catastrophe and physical extinction. First of all, it is important to provide institutionally and innovationally responsible surface management.

The Arctic Regions are the "climate depositary" of the world, and probably, the region that is the richest in mineral resources (mainly hydrocarbons) (UNESCO 2009; Mazur 2010). Attempts to reclaim the Arctic Regions have been made rather long ago. Thus, for example, it is truly known about Russian and European expansions of the XVIII – XIX century. At the present time the urgency of industrial reclamation of the Arctic territories remains rather high. The Russian Federation and the USA are the most active in this issue. Other European countries (Finland, Norway, Denmark, Sweden, and Island) that are represented in the Arctic Council together with the Russian Federation and the USA also make attempts related to industrial reclamation of the Arctic territories. However, they have achieved less progress. The natural system and ecological balance of the Arctic Regions are rather sensible to the attempted expansions. It is expressed in constantly growing ecological damage. That is why international non-governmental organizations like Green Peace constantly lobby initiatives of complete prohibition of industrial reclamation of the Arctic Regions, as well as the use of its transportation potential (Smith 2012; Chater 2012).

In the last aspect it is necessary to note that the Arctic Regions do have a considerable transportation and logistics potential. In the news resources and scientific-journalistic literature, it is possible to read a lot of messages about the current reclamation of the transportation and logistics potential of the Arctic territories, for example:

The development of the Shtockman gas condensate field with the creation of the special functional logistics complex and transportation corridor on transporting cargoes and people from and to the continent,

"Ru-No Barents" project implemented in the interests of Russia and Norway focused on forming the transportation and logistics infrastructure required for producing oil and gas in the Arctic shelf,

"Barents Logistics" and "Barents Logistics 2" projects implemented under financial support of the European Union and aiming at the creation of new transportation corridors to increase the speed and to decrease time expenditures related to the transportation of various cargoes, and

"Northern Air Corridor" and "Northern Sea Route" projects also aim to create trans-boundary transportation corridors and form the transportation and logistics infrastructure required for performing works on producing oil and gas in the Arctic shelf.

Obviously, in spite of the variety of projects and programs related to using the transportation and logistics potential of the Arctic Regions, almost all of them come down to one thing: creation of the infrastructure required for industrial prospecting and reclamation of natural reserves of the hydrocarbon raw materials of this region, which is unique in terms of ecology and geography. Here it is necessary to pay attention to the fact that the feasibility to produce hydrocarbon raw materials in the Arctic Regions remains insufficiently justified in the economic, social, and ecological context, all the more when the prices for raw hydrocarbons decreased down to the historical minimum (McCauley et al 2016).

Besides, the creation of transportation and logistics infrastructure and the use of traditional ecologically aggressive types of transportation also affect the fragile unique nature of the Arctic Regions. In addition to potentially considerable reserves of hydrocarbon resources, the nature of the Arctic Regions is characterized by the considerable biological diversity. Particularly, in the Arctic Regions there are such species of animals and plants that cannot be found anywhere else on the planet. Consequently, the use of ecologically aggressive types of transportation and oils has a negative impact on the biological diversity, and maintenance of the unique flora and fauna of the Arctic territories. That is why solving issues related to industrial reclamation of reserves of hydrocarbon raw materials of the Arctic Regions must be postponed at least to the moment of solving the problems related to creating such transportation and logistics infrastructure that would be characterized by low technogenic and anthropogenic loading on the eco-system of the Arctic and pre-Arctic territories.

Thus, the reclamation of the Arctic Regions in terms of both its industrial and transportation use must be based on the ecologically responsible approach.

2. METHODOLOGY.

The key factor of transferring from resources wasteful or "brown" economy to the ecologically, socially and economically harmonized development is based on the strategic concept called "green economy". The necessity to harmonize ecological, social and economic vector of the development of the modern civilization was continually stipulated in scientific and research works (Meadows 1977; UNEP 2015). They served as the theoretical and methodological basis of this article.

The increase in the ecological responsibility in the transportation and logistics areas was called "green logistics" (McKinnon et al 2015, Christof, Ehrhart 2012, Grandview 2010). The "Green" logistics (including in terms of transportation and logistics potential of the Arctic Regions) is the organization of transporting cargoes and passengers, and other transportation and logistics services. They are delivered to economic agents and agents of the social and household sector by using ecologically safe technologies that do not increase and at the same time decrease the level of anthropogenic and technogenic loading on the global eco-system. The key idea of "green" logistics that does not deny traditional scientific postulates lies in "…achieving more by using less…" (Bowersox et al 1991, Coyle et al 1992, Apostol 2012, McKinnon et al 2015). In other words, green logistics includes two conceptual methodological provisions:

Firstly, it is necessary to gradually and systematically refuse from ecologically harmful and aggressive transport that uses gasoline and other similar types of oil with a high level of exhaling carbonic dioxide in the atmosphere, and

Secondly, it is necessary to intensify the use of transportation capacities not only for the purpose of decreasing the pressure on the eco-system, but also for the purpose of decreasing the loading on the transportation and logistics infrastructure whose recovery is always characterized by high capital volume.

3. RESULTS

The Arctic territories that are adjacent to the North Pole and include the suburbs of two continents (the North America and Eurasia), almost the whole Arctic Ocean with islands, adjacent parts of two more oceans (the Pacific Ocean and the Atlantic Ocean) have a magnificent area – about 27 mln. square kilometers. The Arctic Regions are the least populated world region. At the present time about 4 mln. people live in the Arctic zone. This

is one of the lowest indicators of the population density – less than 7 persons per one square kilometer. In the Arctic zone large modern cities were built (for example, Russian Salekhard, and the Norwegian Tromso). Polar and pre-polar expeditions operate here. Industrial enterprises function, and transportation routes have been blazed.

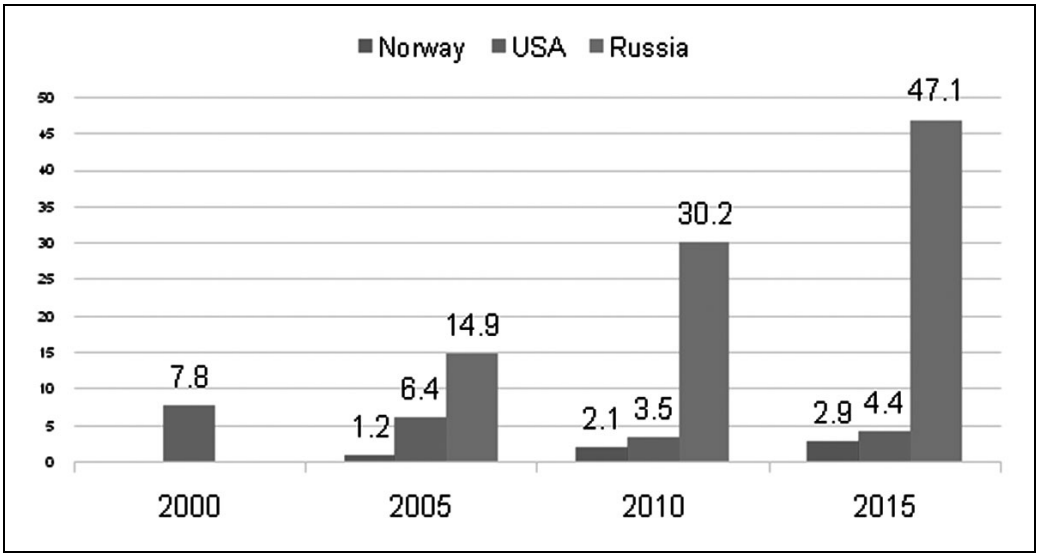
Preliminary expert and research estimations point at the fact that the reserves of hydrocarbon resources in the Arctic Regions are rather considerable. Thus, for example, the reserves of natural gas in the Arctic Regions make up about 30%, and the reserves of oil make up about 13% of all world reserves that were not prospected. They are localized mainly in the open sea at the depth of not more than 500 meters. Herewith, the main reserves of hydrocarbon resources are focused mainly on the Russian Arctic shelf. The perspectives of reserves of hydrocarbon resources of other countries that are represented in the Arctic Council (the USA, Finland, Denmark, Norway, Canada, Island, and Sweden) are smaller (Gautieretal 2009).

Besides, it is necessary to note that the exhaustibility of hydrocarbon resources of the Arctic Regions is estimated much higher than analogous indicators of the continent production. Thus, for example, the existing data about the production of oil and gas on the territory of the American Alaska shows that per year they produce about 15 mlb. barrels of oil there. Herewith, the oil reserves unchangeably decrease and according to the recent estimations they are not more than 6 mln. barrels per year of production. The reserves of gas are somehow higher and make up about 35 mln. cu.ft. However, under the current tempos of extracting resources from deposits the reserves of gas on Alaska can be completely exhausted during the nearest five to seven years (Houseknecht, Bird 2005; Murphy 2013).

Among the European countries Norway shows the most considerable results related to industrial reclamation of the Arctic and pre-Arctic territories. It has been producing marketable hydrocarbons since 2005.

Herewith, the volumes of extracting hydrocarbons from the Arctic surface by this country are comparatively low (see Figure 1), and considerably inferior to the same indicators of the USA (in spite of the fact that the USA have decreased the volumes of producing marketable hydrocarbons 1.4 – 1.8 times on average during the recent 10 years), and moreover the indicators of the Russian Federation.

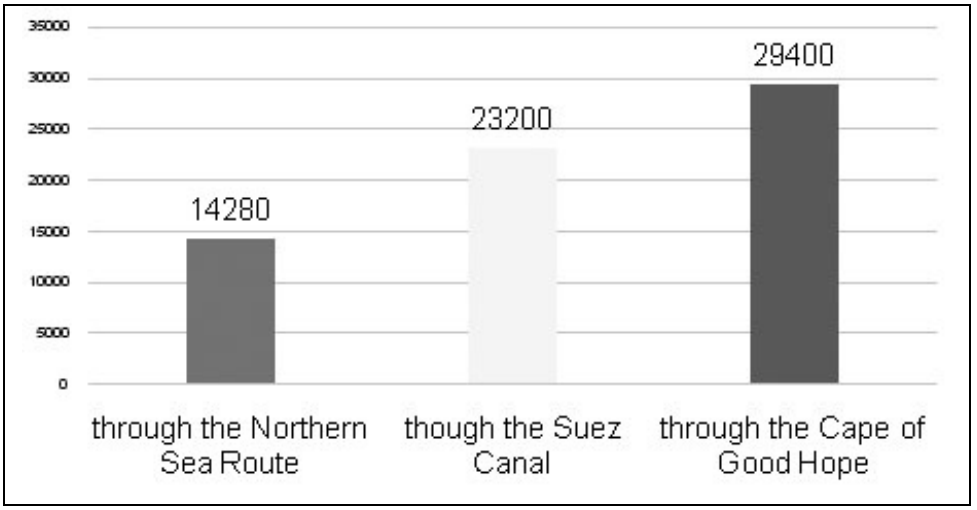
Figure1: Volumes of Producing Market-grade Hydrocarbons in the Arctic Regions, mln. Tons of the Oil Equivalent (Murphy 2013; Mazur 2010; McCauley et al 2016)



Here it is necessary to note that the level of the technological development of the modern civilization does not allow to develop industrial non-aggressive reclamation of the Arctic Regions (first of all, in terms of extracting hydrocarbons from Arctic shelves) with the considerable decrease in ecological risks. That is why it is necessary to make additional investments in the innovational technological solutions that can be used for organizing industrial, scientific and research and other works in the Arctic zone. Unlike Norway, other European countries yet cannot declare about any considerable volumes of hydrocarbons production in the Arctic Region, and obviously the resourceful potential of the Arctic and pre-Arctic European territories will not be fully reclaimed before the problem related to transportation and logistics is solved.

Almost 30 years ago (in 1987) the international boat traffic on the Northern Sea Route was opened, and for more than 20 years there has been the International North Sea Route Program (1993). The Northern Sea Route is a unique competitive advantage of the Arctic logistics. Above all, European countries are interested in its use because the Northern Sea Route is almost 1.7 times shorter than the route from Europe to the Far East (if to go through the Suez Canal), and 2.1 times shorter if to go around the Cape of Good Hope (See Figure 2).

Figure 2: Length of Sea Routes from Europe to the Far East, km



Consequently, when using the Northern Sea Route, the length of the route from Yokohama (Japan) to Rotterdam (the Netherlands) is shorter by almost 35%. And in this case the length of the route from Rotterdam to Vancouver (Canada) is shorter by almost 22% (Table 1).

Table 1.
Length of the Traditional Routes from Europe to Japan and the North America

Route	*in geographic miles*		Fluctuation in %
	though the Suez Canal	through the North Sea Route	
Yokohama-Rotterdam	11,250	7,350	-34.7
Rotterdam-Vancouver	8,920	6,980	-21.7

Concurrently, it is necessary to note that the Northern Sea Route can be fully used only subject to the year-round exploitation of the nuclear icebreaking fleet because the individual transfer of the water transport through the Taimyr and Iona ice massifs is impossible. That is why at the present time the following structural and functional disproportions are characterized for the Arctic navigation:

- The Arctic navigation develops most quickly in water areas of the Barents, Norwegian, and Greenland Seas. Here passing of vessels does not require the assistance of nuclear icebreakers. However, at the same time this type of navigation cannot meet all needs in cargo transportation in the Arctic Regions,

- The main part of transportation used for the Arctic navigation is fishing vessels that cannot be used for transporting industrial cargoes, research equipment, and hydrocarbon raw materials that are greatly needed, and
- Full functioning of the Northern Sea Route (that connects the Atlantic and Pacific Oceans) is already possible in the nearest future. However, it requires new technological solutions because the exploitation of nuclear icebreakers increases the level of ecological threats and technogenic dangers.

Besides, it is necessary to pay attention to the fact that the capacity of the Northern Sea Route is from 50 to 100 mln. tons of bulk and bulk dry cargo. However, these indicators cannot be even compared with those flows of cargo provided by the Suez Canal (above 800 mln. tons of cargoes per year), and the Panama Canal (above 300 mln. tons of cargoes per year) (McCauleyetal 2016; Choi 2010). That was why it is not absolutely justified to consider the Northern Sea Route as a direct competitor of other sea routes in the short and medium-term perspective under the current development of technologies. It is obvious that the perspective of using the Arctic navigation for providing the transportation of hydrocarbon raw materials sets one more serious problem: the necessity to create the expended infrastructure for servicing tankers, vessels and other hydrotechnical constructions.

The production of hydrocarbon raw materials in the Arctic Regions (all the more, from the surface of the Arctic shelf) requires the creation and exploitation of sleet-proof self-mobile or transported platforms. In particular, one of such platforms ("Prirazlomnaya") is rather successfully exploited by the Russian Federation. However, at the same time it is necessary not to forget that before putting the "Prirazlomnaya" platform into operation, there were several serious Arctic accidents related to exploiting hydrotechnical transportation means and constructions. Thus, for example, in 2011 the "Kolskaya" platform went down. It did ecological damage both to the Arctic flora and fauna.

The organization of cross-polar flights is also one of the possible areas of using the transportation and logistics potential of the Arctic Regions. This is in 2011 when there were attempts to create international flights by using the Northern Air Corridor in order to create a new area in the existing system of international transportation corridors as well. However, the efforts of European countries, including the participation of the Russian Federation and the USA at the present time, allow to talk only about the creation of separate infrastructural elements of the Transnational Transportation Northern Axis. However, the Transnational Transportation Northern Axis is

not the route that is used most widely, because there is no required ground support for the water and air traffic.

Herewith, the accumulated ecological damage from implementing solutions of reclaiming the transportation and logistics potential of the European Arctic and other Arctic sectors is estimated at a rather high level:

- First of all, the use of the transportation and logistics potential does not take into account the peculiarities and specificity of severe Arctic conditions that result in accidents related to petroleum products spill,
- Secondly, the used transport is characterized by the ecological aggressiveness. It potentiates the increase in the emission of the carbonic oxide. Herewith, the severe Arctic climate makes people constantly increase the consumption of traditional ecologically dangerous types of fuels, and
- Thirdly, normal life activity of research and industrial expeditions in the Arctic Regions requires constant provision of various resources from the continent. Herewith, the accumulated garbage is left in the Arctic Regions and is not utilized; besides, it does not dissolve naturally. It also affects the biological diversity in the region and causes further pollution of water and air.

That is why the creation and implementation of science-driven and innovational technologies, including those required not only for ecologically responsible surface management but also for forming ecologically safe transportation and logistics infrastructure, is an extremely urgent task.

4. DISCUSSION

Some scientific publications of the recent years predict the role of "the third Rome" to the Arctic Regions where millions of people will live and work. However, indigenous population of the Arctic and pre-Arctic territories as well as new settlers need normal conditions for their life activity and work (in the industry of biological resources, on producing hydrocarbon resources, when conducting researches). Accordingly, it is important to provide reliable power supply, transportation traffic and communications for the population of the Arctic Regions (both current and future).

The Arctic Council that includes eight member countries (Russia, the USA, Canada, Norway, Denmark, Sweden, Island, and Finland) works not only at solving the issues related to reclaiming the resource and power potential of the Arctic Regions but also at solving the problem on maintaining the Arctic flora and fauna. In spite of the fact that the territorial

disputes in the Arctic Regions have not been completed yet (at the present time there are several principles of allocating the Arctic territories and the Arctic shelf: sector principle, principle of the equal remoteness, and principle of allocating according to the boundaries of the continent shelf), the states that are members of the Arctic Council aim at the full maintenance of its natural and resources potential of the future generations.

In addition to the resource potential, the Arctic Regions have a considerable transportation potential. Particularly, here it is possible to establish the sea transportation corridor that connects the Western Europe and South-Eastern Asia. Besides, in the Arctic Regions it is possible to base the transpolar intercontinental aviation. However, at the present moment the Arctic navigation is almost the only variant of transporting the produced hydrocarbon raw materials and almost the only way (without taking into account the Arctic aviation) to ensure the life activity of research and industrial organizations that function in the Arctic zone.

(a) At the present time all European countries that enter the Arctic Council developed their own strategies of reclaiming Arctic, in particular:

(b) The strategy of Norway includes seven basic priorities, such as research, resourceful (production of hydrocarbons and renewable biological resources), infrastructural, transportation, legal, and ecological,

(c) The strategy of Denmark postulates two key priorities: development, social and economic, and infrastructural arrangement of Greenland, as well as claiming the sovereignty in the region,

(d) The Arctic doctrine of Finland is characterized by the specification of the following solutions. First of all, Finland has a unique experience and technologies of reclaiming the Arctic and pre-Arctic territories, and these technologies can be used for scientific, engineering survey and other works in the region. Secondly, Finland is most of all interested in transportation and communication projects in the Arctic Regions,

(e) The strategy of Sweden is the most politicized and military-focused. Its basic attention is paid to the protection and defense of the Arctic boundaries in spite of the fact that Sweden does not have a direct passage to the Arctic coast, and

(f) The strategy of Island that does not have a direct passage to the Arctic territories defines three most important priorities: research and technical (development and implementation of special technologies to provide normal industrial and research activity), ecological (elimination of the

accumulated ecological damage), and infrastructural and ethic (provision of normal conditions for the life of the indigenous population of the Arctic Regions).

It is obvious that only two countries (Finland and Island) out of five European Arctic countries accurately form their priorities and realize the strategic importance of establishing efficient and simultaneously ecologically safe transportation and logistics infrastructure in the Arctic Regions. That is why it is necessary to consider the following primary tasks of the reclamation of the transportation and logistics potential of the Arctic Regions:

- Formation of the material and technical base for the Arctic navigation and cross-polar flights, creation of the land roadway network from the European continent through pre-Arctic territories,
- Cooperation in the area of using and creating of new units of safe icebreaking fleet by the countries of the European Arctic (at the present time such European Arctic countries as Sweden and Finland have icebreaking fleet; herewith, two Swedish icebreakers were on the North Pole),
- Development of navigation and informational communications systems by using satellite and space technologies that provide high stability of connection, and
- Creation of autonomous systems of generation and power supply by using mainly renewable sources of power.

When forming the material and technical base for the Arctic navigation and cross-polar flights, it is necessary to take into account not only severe climate conditions, but also the level of the environmental friendliness of the used materials for the construction and installations, creation of mechanisms and aggregates. Here, above all, it is important for the applied materials to be created with the minimum ecological loading and in future to be recycled. Thus, for example, for the creation of Arctic constructions it is possible to use technological solutions that simultaneously have small weight, resistance to low temperature, and endurance. Besides, the constructed materials created by using such technologies can be subject to the waste recycling after retiring, and their relatively small weight makes the transportation cheaper. It allows to timely remove these materials to the continent, avoiding the accumulation of the garbage that is not utilized and dissolves naturally in the Arctic Regions.

Issues related to the construction of the transportation network (railway and highway service) on the Arctic and pre-Arctic territories are the most difficult ones. Here the problem is in low return of investments focused on the implementation of projects related to creating such networks rather than in severe climate conditions:

- Firstly, for the indigenous community of the European Arctic, the railway service is required only for trips to the continents. In the Arctic Regions people use the transport that allows to comfortably move even when there is no high quality railway service. On the pre-Arctic territories of Europe the branchy network of the railway and highway service has already been created,
- Secondly, the Arctic Regions (not only its European part) are an under-populated region. Consequently, the existing population as well as research stations and separate industrial objects have a constant territorial localization. Quick connection between them is implemented by using cross-country vehicles and rotor-wing equipment. The indigenous Arctic population also uses traditional national means of transportation to move between stops.

Taking into account these two facts, it is necessary to develop the highway network in the European Arctic in those areas that will be used in the future as technological and engineering connectors to the basic transport routes and extremely important infrastructure objects that will provide functioning of these routes.

Issues related to creating and exploiting the icebreaking fleet for the European Arctic are especially urgent. The most powerful icebreaking fleet was created in the Russian Federation. However, the Russian icebreakers use nuclear engines. Undoubtedly, it creates additional ecological threat in case of accidents and catastrophes of icebreaking vessels. Along with this, it is necessary to note that non-atomic icebreakers are characterized by low power and do not provide normal passage of heavy loads along the Northern Sea Route.

In this case it is possible to find the solution in the context of using nuclear reactions based not on the division of the nuclei (nuclear decay) but on the nuclear fusion. The reaction of the nuclear fusion is a natural reaction that is characterized by a lower level of technogenic danger. There are already separate solutions on using the nuclear fusion (as autonomous power plants). However, it is necessary to continue the work on creating engines for icebreakers on the basis of the reaction of the nuclear fusion. At this moment

technological solutions on creating engines on the basis of the nuclear and thermonuclear fusion exist as laboratory prototypes and require considerable investments. For countries of the European Arctic the issue on investing in the development of icebreaking fleet of new generation can be solved due to the cooperation that will be based on the institutional and innovational multi-scale project of the development of the European Arctic territories.

One more problem that must be solved for the reclamation of the transportation and logistics potential of the Arctic Regions is the problem of navigation and informational communications. This is not a secret that in the Arctic Regions traditional systems of navigation and communications cannot function smoothly. That is why countries of the European Arctic, the Russian Federation, the USA, and Canada implement research and technical projects on creating new systems of navigation and connection by using space technologies. In this case it seems to be correct to unite the efforts of Arctic countries (and not only countries of the European Arctic) to create lateral tropospheric lines to enter the basic fiber-optic route that connects Europe and the Far East. The integration of such digital network with the existing ones, as well as with the designed modern systems of the satellite-link communication and mobile communications systems will allow to create optimal informational and communicational channels in the Arctic Regions.

One more important moment that requires attention is the issue related to providing objects in the European Arctic with power. Up to now the issue related to providing Arctic objects with power has been solved by bringing fuels from the continent. It causes the accumulation of empty and partially empty tare the fuels are brought in. It has an extremely negative impact on the state of the environment in the Arctic Regions and increases the level of the ecological damage that has already been accumulated.

In order to solve the problems related to providing European objects in the Arctic Regions with power, it is possible to use the solutions offered by Russian researchers. Particularly, for this purpose it is possible to use nuclear cogeneration plants, as well as plants of small capacity that use renewable resources of power (for example, wind generators) (Melnikov et al 2015). In order to accumulate the power from renewable sources, it is possible to use the equipment based on high temperature superconductivity technologies.

Thus, it is obvious that the reclamation of transportation and logistics potential of the European Arctic, as well as further industrial reclamation of this region and ecologically safe surface management in it are possible

subject to the implementation of international institutional and innovational projects. That is why the Arctic Regions must be considered not as a region of international competition but as a region of international cooperation.

5. CONCLUSIONS.

The Arctic zone is the world heritage. Herewith, the eco-system of not only the European Arctic but also other Arctic sectors is characterized by the fragility and vulnerability, as well as inability to quickly renew after technogenic and anthropogenic negative impacts on it. The Arctic Regions are considered to be the climate laboratory of the planet. Physical maintenance of the modern civilization and maintenance of its natural environment for future generations depends on maintaining its eco-system (Dudin et al 2015; Dudin , Frolova 2015).

In order to efficiently and ecologically safely reclaim the European Arctic and use its resourceful potential, it is necessary to create the transportation and logistics infrastructure that would be based on the concept and principles of the "green" logistics. Now the current accumulated ecological damage in the Arctic Regions is rather considerable. It is possible to observe changes in the nature in this region. They are expressed both in the decrease in the biological diversity, and the pollution of waters and atmosphere. In the future the wasteful exploitation of the Arctic Regions, its resourceful reserves can cause an ecological catastrophe. That is why in the current situation it is necessary to postpone the implementation of ambitious projects of surface management in the European Arctic and primarily solve transportation issues and issues related to creating ecologically responsible logistics in this region. It will allow to implement the international projects that have already been started, including the ones focused on creating the Northern Sea Route and the Northern Air Corridor with the minimum anthropogenic and technogenic loading on the Arctic eco-system.

In our opinion, the Arctic Regions must be considered not as a zone of international competition and contest but as a zone of international scientific, technical and institutional cooperation. First of all, all countries that are represented in the Arctic Council must find compromise solutions in terms of joint reclamation of industrial and transportation and logistics potential of the Arctic and pre-Arctic territories.

Stable social and economic development of the European Arctic cannot be implemented beyond the context of "green" economy and "green" logistics. At the same time it is necessary to note that the provision of stable

social and economic development of the European Arctic requires considerable investments that not always can be financed by one country. Moreover, the issues on transboundary cooperation in the Arctic Regions are the most actual. That is why the countries of the European Arctic as well as the Russian Federation, the USA and Canada must actively cooperate in order to, on the one hand, ecologically responsibly reclaim industrial and transportation and logistics potential of the Arctic and pre-Arctic territories, and on the other hand, maintain the unique heritage of the Arctic Regions for future generations.

In this article we have revealed general issues related to the ecologically responsible approach to reclaiming industrial and transportation and logistics potential of the European Arctic. In future researches we will pay attention to such aspects as methodology of estimating the accumulated ecological damage in the Arctic Regions, and areas of institutional and economic cooperation of the countries that are represented in the Arctic Council.

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