LUISS

Department of Political Science

Chair of Security Studies

Arctic region, climate change and multidimensional security.

Opportunities and challenges for Italy.

Thesis Supervisor
Prof. Carlo Magrassi

Thesis Co-Supervisor
Prof. Giuseppe Scognamiglio

Candidate
Flavia Pace
641572

Academic Year 2020/2021

Nulla tenaci invia est via

Index

Introduction

The Arctic region is coming to the forefront of the international scenario. From an area of high confrontation and tensions in the 70s, it moved toward a peaceful area where cooperation and dialogue are the main driving principles. In this context, Arctic states underline and stress the importance of their sovereignty over the region; the national sense of identity and belonging are elements that are at the basis of Arctic governance and management. Climate change has been a catalytic factor that brought the region to the center of attention. Indeed, the ice melting, the oceans' rise, and the warm temperatures make the Arctic a much more accessible region. The studies forecast that the region could be free of ice during the summer period of 2035; moreover, further accessibility may be reached in the following years with a lack of ice even during some winter periods. Nowadays, most of the ice present in the region is first-year ice; this implies that the ice that has survived several summers is now melting. This situation opens new prospects and scenarios for the coming years, especially for the Arctic countries, the main actors involved. These countries govern the region and have several interests at stake if the environment keeps changing. Global warming is causing and will keep causing ice and permafrost to melt, drastically changing the environment, the flora, and the fauna living conditions. Moreover, there is a significant risk that dangerous bacteria will be airborne due to the ice melting influencing the human lifestyle and habits.

Several interests are connected to the region that Arctic states want to protect and non-Arctic ones want to exploit. First of all, the Arctic is abundant in resources; in 2008, the US Geological Survey published a report about the new resources in the Arctic, and the most critical data were related to oil and gas: the Arctic contains 13% and 30% of their respective undiscovered, but technically recoverable, reserves. These resources represent a significant potential for the future global energy sector. Furthermore, the region is characterized by the significant fishing stock traded and exported in the global market. Indeed, the Arctic Ocean is one of the most important fishing grounds globally, with many countries sending their vessels there. Moreover, the region's peacefulness is an element that attracts countries and entices them to develop economic plans and political strategies in the territory since few possibilities of clash occur. All these factors attract the interest of countries claiming rights in the region and potential investors from non-Arctic states. The increasing potentiality of the region is also characterized by the growing attention toward the Arctic routes. Different passages cross the region, and the possibility of using them as an alternative to the traditional routes is extremely attractive for states. The Northern Sea Route, the Northwest Passage, and the Transpolar Sea Route are opening up, calling the attention of the Arctic and non-Arctic states.

Indeed, several studies demonstrate how these routes would significantly reduce costs, travel days, distance, and fuel consumption to connect East Asia, Europe and North America. The ice melting rate is expected to increase, and countries are willing and interested in using alternative routes to increase the shipping and make it cheaper and faster. The attraction toward the region is doomed to increase, and new scenarios, prospects, and changes will influence the security level of the Arctic. Environmental, economic, and international security are intertwined in the region, representing the primary shapers of its future. These security concerns and issues mainly drive the Arctic and non-Arctic states' decisions in the region.

Since 2013, Italy is an observer in the Arctic Council, and it owns the power to take part in meetings and discussions to have a say in the future of the Arctic. The Italian involvement in the region can be dated back to roughly one hundred years ago, and from an initial scientific involvement, it evolved to economic, scientific, and maritime participation and contribution.
After giving an overview of the current Arctic condition and its developments in recent years, the main aim of the thesis is to understand the challenges and opportunities for Italy in the Arctic, a region whose centrality is growing and calling several states' attention. Italy managed to have a say in Arctic affairs and the scientific research in the region. It is essential to understand whether the country will have its own space and seize the future economic, social, military, commercial, and scientific opportunities in the region.

The first chapter of the thesis presents the overall Arctic's condition and governance, deepening its strengths and fragilities. The chapter deepens all main elements and characteristics that the region owns and represent a source of interest for countries. The Arctic governance is in the hand of the eight Arctic countries that mainly manage this precarious situation and conduct international campaigns and meetings in order to reduce as much as possible, increasing damages. The chapter analyzes the difference between the Arctic Five and the Arctic Council, and it presents the Arctic sea's primary legislation. This comparison is essential to understand the Arctic balance and how the Arctic countries regulate their territories and foreign participation in decision-making. Moreover, the chapter presents the region's critical climate condition and describes the worrying ice extension, graphs and concerning data, and the future expected consequences.

The second chapter deeply analyzes the primary Arctic states and international organizations' position in the region in order to give an overall view of their intentions, interests, and fears in connection to their territory. Russia and Canada are aware that their region is becoming increasingly attractive, and

they have to protect their interests with all the necessary tools. Indeed, these two countries are the ones that are harshly defending some of the Arctic routes considering them part of their internal waters. The countries are well aware of the economic potential that they have. Moreover, countries are increasing the military presence and deployed exercises, keeping for the moment a defensive attitude. Meanwhile, NATO and the EU do not present a clear and well-defined position toward the region. While NATO has to balance a soft and a more substantial intervention, Europe still has to develop a specific strategy for the region. A growing international interest toward the region seems inevitable, and the Arctic countries have to find the right balance between national interests and sovereignty and international aims and economic attraction. Indeed, some external non-Arctic countries have a voice and a position in this context and are willing to make their voice heard in order to influence, contribute and gain from the Arctic region. The observer status in the Arctic Council gives them this power. These actors include China, which has defined itself as a near-Arctic state. Indeed, it is investing significant money in the region to exploit the territory and its natural resources. The Arctic is the new main Chinese focus, as declared in its White Paper released in 2018, and it has all the intention to occupy a prominent position in the region. China has already invested significant money in the Arctic countries, and it is intended to cover a decisive role in the region. Its "near Arctic-state" status worries some Arctic countries, and risks to drastically influence the future of the Arctic routes and their investments. Indeed, the main Chinese aim is to deviate part of the trade from the Suez Canal toward the north. This risks to threaten Mediterranean ports, including Italian ones. It is crucial to underline how the region is rich in terms of potentiality: the number of undiscovered and unreached underground resources is extremely attractive for states, the energy production capacity is immense, and the possibility of the opening of new Arctic commercial routes is calling the attention of states that want to be included in the Arctic changing and development. The Arctic has been defined as the new Eldorado, and climate change is speeding up the possibilities for countries to access this prosperous and not anymore isolated region.

Italy is already involved in the Arctic system, and it is important to analyze if it owns the tools and resources to keep covering a role in the region and implementing it in the following years. Therefore, the third chapter presents the opportunities and prospects of the Italian involvement in the region. Using research as the main driving factor, Italy boosted its involvement in the Arctic. Indeed, it owns platforms, tools, and know-how that could likely increase its opportunities in the region; Italy could gain from the Arctic and, at the same time, contribute to defining the future shape of the region.

Finally, the last chapter presents the prospects and future plans of the Arctic routes. In the following years, ice is expected to melt faster, allowing the Arctic routes to open. The three main routes in the analysis are the Northern Sea Route, the Northwest Passage, and the Transpolar Sea Route. This scenario presents a severe challenge for Italy: a significant part of the maritime trade could deviate toward the north, reducing the passages and the ships' Italian ports' call. Even if this phenomenon is doomed to occur in at least 15 years, Italy must prepare itself and find a way to keep its port system competitive and attractive for the largest shipping companies. At the same time, Italy has to find a balance between the possibility of impacting its port system through the Arctic routes and its international involvement in the Arctic to implement the development of these routes where several Italian interests can be found.

The research aims are to analyze and understanding the Arctic's current condition, its governance, and its potentiality connected with multidimensional security aspects. Environmental, international and economic security are different declinations of security intertwined in this fragile and vulnerable environment, shaping the region's development. The dissertation will be focused on the opportunities and challenges that Italy, a non-Arctic country with a centenary interest and involvement in the region, will face. The aim is to understand if Italy can still grow and contribute to this environment and if it will be able to seize new opportunities. At the same time, some challenges might emerge for Italy in connection to this region. It is essential to understand if Italy will find a balance between challenges and opportunities connected to this region and manage to make its voice heard in the international scenario.

In order to achieve the aim of the research, several official Arctic states' documents have been consulted to fully understand the Arctic states' position and attitude toward the region. Indeed, it is essential to understand the roles, positions, and strategies that the leading Arctic states have toward their territory. In the last years, Russia released numerous documents in order to develop and implement its strategy toward the Arctic. In the same way, Canada, with the Canadian Northern Policy Framework, set aims and objectives for its involvement and activities in the region. In addition, the Chinese release of its Arctic White Paper surprised the international community and represents a document to monitor and study carefully; this paper may drive significant Chinese intervention in the region. The 2015 Italian Arctic Strategy has been an essential document to understand the current Italian positioning in the region and predict and analyze its future involvement. Subsequently, different interviews have been conducted with significant actors from different backgrounds, strictly connected to the Italian participation and contribution to the region. The Italian Ambassador in

Norway, Alberto Colella, and the plenipotentiary Minister and special envoy for the Arctic Carmine Robustelli gave their views about Italy's future opportunities and challenges. Their contribution was essential in order to draw a better picture of the Italian situation in the region. Finally, some interviews have been conducted with the researchers and scientists of the Italian Center of National Research dealing with Arctic issues and matters to analyze and understand the future of Italian research in the region.

1. The importance of the Arctic region for multidimensional security

1.1 The Artic centrality and fragility

The scientists define the Arctic as "the region above the Arctic Circle, an imaginary line that circles the globe at approximately 66° 34' N."[1] The Arctic includes the Arctic Ocean basin, northern areas of Scandinavia, Russia, Canada, Greenland, and the US state of Alaska. It is quite difficult to delineate the limits of the Arctic: it is a sea of ice surrounded by land that stretches over six Arctic countries; usually, the main used criterion is the cold that is defined by the line that combines locations above which temperatures do not rise above 10° C in the hottest month (July). This line, also known as isotherm, roughly coincides with the end of forests that become tundra. The outline of the Arctic region, thus assumed, is in any case, jagged and irregular.

There are two main lines of thought at the international level, regarding the consideration of the Arctic territory: the first and currently dominant position tends to recognize Arctic as a regional identity denying any conception of the region as a global common to freely access and exploit. The second considers the Arctic as an international common good since it lacks the fundamental elements that usually characterize a political-geographical region (the amount of population living there, stable and organized presence of human groups, specific local governance and well-defined territory). The United National Environment Program defines the Global Commons as "resource domains or areas that lie outside of the political reach of any one nation State."[2] These commons are generally accepted to be the "sea, air, space, and cyberspace."[3] This definition is particularly important in order to understand the different actors' positions and claims fully. The first group of thought is composed of the Arctic Five, those states that have direct access to the Arctic Ocean (Russia, Alaska, Canada, Greenland and Norway). According to this thought, considering the Arctic as a "common good", taking as the primary reference the Arctic high sea, the portion of the sea under the jurisdiction of no states, is not judged a sufficient and fair element. They underline how most of the Arctic region falls

[1] What Is The Arctic? | National Snow And Ice Data Center", *Nsidc.Org*, 2020, https://nsidc.org/cryosphere/arctic-meteorology/arctic.html#:~:text=Most%20commonly%2C%20scientists%

[2] United Nations Environment Programme, *International Environmental Governance of the Global Commons*, http://www.unep.org/delc/GlobalCommons/tabid/54404/Default.aspx

[3] Tara Murphy, "Security Challenges In the 21St Century Global Commons", *Yale Journal Of International Affairs* 52 (2010): 28.

under their national jurisdiction, and therefore, no international claim can be made. According to the UNCLOS Convention, the coastal states enjoy sovereignty over the natural resources in the Arctic Ocean within 200 nautical miles of distance from the coast in the Exclusive Economic Zone, beyond which there are international waters. However, according to the UN Convention on the Law of the Sea, each country has ten years to formulate a claim to extend its continental shelf before a special Commission. These states tend to legally extend their continental shelf to ensure additional energy resources' supply and avoid as much as possible external and international claims over them. According to this first though, the Arctic is considered an area falling within the geopolitical orbit of the interests of the states bordering it. Conversely, the second line of thought perceives the Arctic as a global common. The actors involved base their statement on the abundance of resources and economic opportunities located in the area, at the disposal of all the international community; moreover, the lack of a specific Arctic treaty or convention supports region's assessment as global common. This means that the region is seen as an international, borderless area and all the resources, from gas, oil to fish and iron are available for any states. This allows these states always to have a possibility of accessing the region even without a specific plan or interests; this ensures states a non-excludability principle. The definition of the Arctic as a global common is based on the lack of a legal regime and the UNCLOS legislation definition of the high sea as subject to international norms and customs in addition to common maritime law. These two elements are considered sufficient to claim rights over the region. States oppose the first school of thought since they affirm how Arctic states' focus is limited to issues such as claiming Exclusive Economic Zones so that "resources can be exploited, rights and resources for sea passage, and the like."[4] It is evident how protecting the environment and changing a business-as-usual approach are not the priorities, contributing to the further degrading of the ecology of the region. However, the two schools of thought refer not only to high seas but to outer space too. The management of outer space issues can be concisely understood as the three C's, an abbreviation for congested, competitive, and contested space.[5] There is a concern that the need for outer space as a resource means that states are fighting for space supremacy. The space is regulated by the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), but international claims overlap. The satellites' role of surveillance, search and rescue, navigation, weather forecasting, fishing, prospecting, sea-ice monitoring and environmental research are perceived either as a national tool for individual aims or as a tool that should be jointly used for a larger benefit of the international community.

[4] Pradeep Kumar Gautam, *The Arctic As A Global Common* (New Dheli: Institute for Defence and Analysis, 2011).
[5] Roger G. Harrison, "Unpacking The Three C's: Congested, Competitive, And Contested Space", *Astropolitics* 11, no. 3 (2013): 123-131, doi:10.1080/14777622.2013.838820.

The clash that emerges from these two positions is a real international confrontation that creates a net separation between a realist and a liberal approach. The school of thought that does not consider the Arctic as a global common has developed an individualist and self-referred approach; it mainly perceives the region as a competitive arena for resources calling for selfish national interest. The realist actors are egoist and rational, perceiving the environment as highly competitive. In a highly fragile region as the Arctic, those states cannot allow external actors to exploit and take advantage of their national territories and resources. Conversely, those who perceive the region as a global common demonstrate a liberal approach. The Arctic arena does not exclude cooperation among actors; rather it favors progress and collective security. According to these actors, promoting an international free commerce in the region will be cheaper and more beneficial than the competition. In this regard, China is looking at the Arctic routes under national jurisdiction: the North West passage under Canadian control and the Russian Northern Sea Route; despite some states are defining these routes as international waters, the two Arctic states have no intentions of reducing their national sovereignty over these parts of the sea. They do not want to increase possible external penetration and exploitation of the corridors. The considered problem is that especially the Canadian case, may lay the ground for a worldwide precedent encouraging other states to affirm their sovereignty over waters considered international by law.
Re-defining and clarifying the actual and unclear blurred distinction between the whole Arctic region and the high sea may be a starting point to find a first common ground among the two positions. Forcing one of the two approaches will benefit neither the Arctic Five nor the non-Arctic states. During the thesis it will be possible to deeper analyze states' positions and interests to better understand which position states should better take into consideration.

The Arctic region has seen in the last years a rebirth of interests at the global level. From being an area of control and confrontation between the superpowers in the bipolar period, it has been transformed, starting from the early 1970s and with a long-lasting process, into a world area of growing geographical, political and geostrategic importance. During the bipolar confrontation, on the one hand, it was crossed by endless submarine patrols, military bases surrounded it and it was the object of control and nuclear plans that made it a "special observer" of rival superpowers; on the other hand, it saw its economic weight grow exponentially, starting from when, at the end of the sixties, important deposits of fossil fuels were discovered on its seabed. The Arctic Ocean thus worked and currently works as a separator of the two most decisive bicontinental masses on the planet: America and Eurasia; key territories and the birthplaces of the world's major powers: USA, Russia, and China. Nowadays, what happens in the Arctic does not remain in the Arctic. The ice melting and the

consequent easier access is calling the attention not only of the eight Arctic states (Russia, United States, Denmark, Finland, Sweden, Norway, Canada, Iceland), but also of other powers with no direct geographical connection to the Arctic Ocean, such as China.

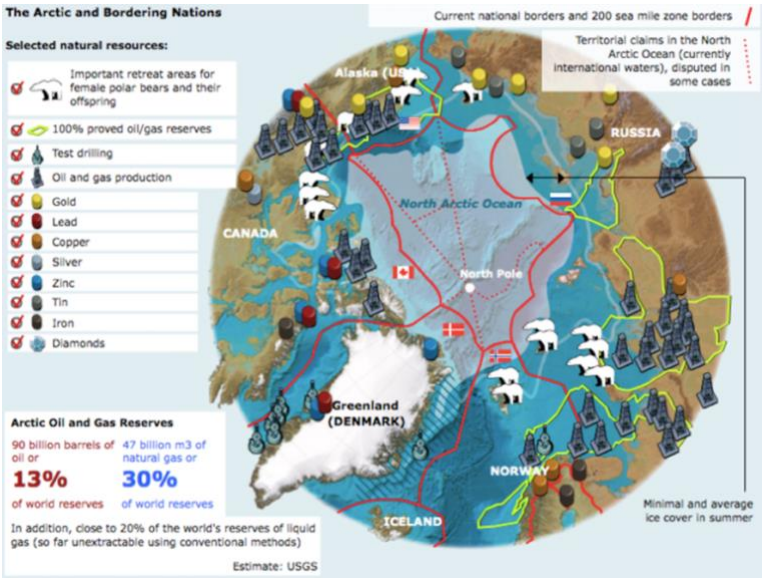
The sovereignty and the national sense of identity and belonging to the region are the basic starting points when discussing the Arctic increasing relevance. In July 2007, Canada's Prime Minister, Stephen Harper, made a statement that became famous in this regard, affirming that: "Canada has to choose between defending our sovereignty over the Arctic. Either we use it, or we lose it. Moreover, there is no doubt that this government intends to use it. Because Canada's Arctic is central to our identity as a northern nation, it is part of our history. Furthermore, it represents the greatest potential for our future".[6] Subsequently, all the states bordering the Arctic Ocean have presented their identity as inextricably connected to the Arctic. With the same Canadian national proud, Norway usually refers to its national exploration activities when giving official speeches about the region. US, during their chairmanship in the Arctic Council, underlined the necessity of strengthening the US Arctic identity. Identity is a real political factor and a tool in Arctic geopolitics. As it will be later explained, the current Arctic dynamic is not characterized by conflict and war, but it is an actual race to establish the significant influence in the region; the aim is not excluding other states but ensuring its own place at the Arctic "roundtable". The national identity is considered extremely useful in Arctic local environments, and in the international political and economic confrontations. Among the Arctic states, there are important commonalities and differences of developing and expressing the sense of national belonging. The Arctic identity can thus be shared among polar actors to work together and cooperate on specific issues, but it can also be something that divides states remarking the different roles in the region. However, there are further non-Arctic states that refer to the Arctic identity to legitimate their activities in the region; remote actors have different strategies and tools, such as history, research, climate change fight and ideological proximity to claim their place in the region. As it will be later analyzed, this is the case of Italy and China. The Arctic geopolitics is not exclusively reserved to national levels, but it includes international ones too. The Arctic is neither a national region nor the geographical center of states bordering over it; it is a complex environment where identities, claims, and history overlap. Being in the Arctic has become something essential to gaining influence and a good name: those who deal with the Arctic are concerned with the health of the planet, with scientific research, and environmental protection. However, these should be added to the economic and geopolitical factors that have brought the Arctic back into history.

[6] Government of Canada, Prime Minister Stephen Harper Announces New Arctic Offshore Patrol Ships, 2007, https://www.canada.ca/en/news/archive/2007/07/prime-minister-stephen-harper-announces-new-arctic-offshore-patrol-ships.html.

The main element that is making the Arctic the center of attention is the energy potential of the region; the discovery of fossil fuel deposits (natural gas and oil) through the years made the Arctic a new reality for new industrial activities. In 2008, the US Geological Survey published a report about the unexplored resources in the Arctic, and the most important data were related to oil and gas: the Arctic contains 13% and 30% of their respective undiscovered, but technically recoverable, reserves.[7] Apart from being an important source of revenue, this aspect is creating some frictions among countries leading to a latent international confrontation, not always easy to settle and manage. Therefore, in the next chapter, it is analyzed how the two continental masses overlook the Arctic Ocean: Eurasia and North America; here Russia, China, Canada, and USA have and settle interests and aims that could have some common goals risking a real overlap. However, the availability of resources will not probably be enough to trigger a conflict, and it is important to underline how most of hydrocarbons reserves is under coastal states' jurisdiction. In addition, the central part of the Arctic Sea available for international exploitation is 2.8 million square kilometers. It is one of the most unknown places on earth due to its sea depth (maximum dept 5.450 meters) totally unexplored.

The image below shows all the different resources that the region offers and their geographical locations; it emerges that the most significant concentration of oil and gas production is currently located in Russia, with a substantial presence in Alaska. Diamonds are located exclusively in the Russian Arctic, given the country and essential leverage in the resources' sectors. Copper, iron, tin, and other resources are diffused in the whole region with no significant remarks. It emerges that silver is placed only in the Canadian territory, while lead and zinc can be found mainly in the western hemisphere. There is not a leading country owning and disposing all the resources that the Arctic offers: they are scattered around the territories. This gives more leverages to some countries in abundance of crucial resources such as oil and gas in Russia and Alaska; at the same time, these resources distribution may provide some countries with some specific advantages that, if cleverly manage, can become a real asset for the nation.

[7] "Charles Geisler, "Cambiamento Climatico e Risorse Naturali nell'artico", Human (In)Security E Ambiente, 2016, https://www.twai.it/articles/cambiamento-climatico-e-risorse-naturali-nellartico/



Der Spiegel, Ecological society of America, "Arctic flora and fauna" Study, "Le monde diplomatique", Britannica USGS, 2018

The table below indicates Arctic areas where estimated undiscovered technically recoverable conventional oil and natural gas resources for the eleven larger Arctic basin provinces are located. These eleven provinces account for about 400 billion barrels of oil among the Arctic resources. The provinces are presented in ranked order of total equivalent of barrels of oil. The first data that emerges is the significant detachment that Siberia gives to all the other provinces; the most prominent gap corresponds to about 127 billion barrels. It occurs between Siberian reserves and Eurasia basin ones. Despite the Arctic Alaska being the second territory in terms of oil and gas disposal, the table distinctly shows how the disparity with Russia is still remarkable; indeed, roughly 60 billions of barrels differentiate the two countries. A significant Siberian data that need to be stressed is the crude oil disposal: Siberia owns only 3.66 billion barrels of crude oil in comparison to 29.96 billion barrels of Arctic Alaska; despite this big gap, Moscow still owns an advantage over the American province. The table clearly shows the evident advantage of the Kremlin over all the other Arctic countries, constituting significant leverage.

Province Code	Province	Oil (MMBO)	Total Gas (BCFG)	NGL (MMBNGL)	BOE (MMBOE)
WSB	West Siberian Basin	3,659.88	651,498.56	20,328.69	132,571.66
AA	Arctic Alaska	29,960.94	221,397.60	5,904.97	72,765.52
EBB	East Barents Basin	7,406.49	317,557.97	1,422.28	61,755.10
EGR	East Greenland Rift Basins	8,902.13	86,180.06	8,121.57	31,387.04
YK	Yenisey-Khatanga Basin	5,583.74	99,964.26	2,675.15	24,919.61
AM	Amerasia Basin	9,723.58	56,891.21	541.69	19,747.14
WGEC	West Greenland-East Canada	7,274.40	51,818.16	1,152.59	17,063.35
LSS	Laptev Sea Shelf	3,115.57	32,562.84	867.16	9,409.87
NM	Norwegian Margin	1,437.29	32,281.01	504.73	7,322.19
BP	Barents Platform	2,055.51	26,218.67	278.71	6,704.00
EB	Eurasia Basin	1,342.15	19,475.43	520.26	5,108.31

USGS World Assessment Team, 2000, U.S. Geo- logical Survey World Petroleum Assessment 2000-Description and Results: U.S. Geological Survey Digital Data Series – DDS60

https://pubs.usgs.gov/dds/dds-060/

When talking about resources, it is crucial not only to consider minerals and coal but all the different resources that the Arctic region offers. The fish stock of the region includes products such as shrimps, snow crabs, cod, herring, and sardines. The Arctic Ocean is one of the most important fishing grounds globally with many countries sending their vessels there. However, overfishing is becoming an increasing problem and a threat to the natural environment. Moreover, the Arctic is rich in vegetation, as the shrub formation shows. The boreal forest is the largest natural forest on earth; although it is affected by agricultural and logging activities, strict environmental regulations have limited its exploitation. All these valuable raw materials give Artic a specific relevance and centrality attracting the interest of countries claiming rights in the region, and potential investors from non-Arctic states. Secondly, in the polar region, the stakes depend on the most essential element: knowledge. To be in the Arctic and to use it, it is necessary to know it. The Arctic is still essentially a mystery, which fuels its fascination and determines the state-research nexus. Glaciologists and climatologists must be consulted in order to predict the stability of future shipping routes. It is necessary to conduct geological surveys to exploit resources, and claim underwater ridges. Unknow is the core of states' interest to find out new opportunities, new revenues and discoveries they can take advantage of. The new Artic centrality is thus given by its unexplored land and its new economic potential. This is why states are building research centers, investing in research activities, and developing new technological means. New core drilling techniques to extract cylinders from glaciers and polar shelves are giving scientists new opportunities to study polar algae, and dust pollutants so that they can better understand and study the food chain and biological systems of the region. Those who invest more in research will have more "weapons" in the region, and the states understand this.

The increasingly plausible possibility of making the northern routes navigable makes the Arctic the center of new future vital scenarios. This has been demonstrated by the recent expeditions that have covered both the Northwest Passage (Canada) and the connection, close to the coast of Russia, that

starting from Europe can reach Japan through the Bering Strait; this allows to avoid the passage through the Suez Canal, shortening distances and travel times. The evident “areal" climatic changes in the Arctic are making the routes from the Atlantic to the Pacific more and more feasible.[8] The possibility of a Polar Silk Road and the possibility of permanently opening the Northern Sea Route are becoming a long-term possibility; the concrete chances of reducing costs and time are therefore desirable to the states. Arctic centrality is also due to the new possibility of controlling the extreme north from a new position; the Russian certainty that the ice would have always protected the north side is slowly decreasing, opening new possibilities and accesses to the country. At the same time, Europe can be threatened by a potential power and control from the Arctic region; this is also why the European Union is recently developing an integrated policy for the Arctic to make a significant contribution in regional and multilateral fora dealing with Arctic issues and security.

One of the main peculiarities of the Arctic is its actual pacifism. The Arctic indeed is a pacific area extraneous to any conflict; it represents a model that should be ideally exported. This characteristic makes the region charming for states. The first person to attribute this adjective to the region was Gorbachev, who affirmed “Arctic, area of peace” during his speech in 1987 in Murmansk, Russia.[9] After the Cold War, the area became a place of cooperation and the Americans and Scandinavians were expecting to shape the region in their image and likeness. However, there is also the other side of the coin that needs to be analyzed; we can consider the pacific Arctic as the best place to look at, but, at the same time, through the marginalization of the military apparatus, the Arctic may risk getting caught unprepared. The army indeed is the one that owns the tools to put in place the agreements signed among the countries, and it is the one able to guarantee the safety and protection of the region. Therefore, Russia increased by 30% the *Specnaz* [10] presence in the Arctic territories in the last four years with an unprecedented military build-up. It seems clear how the states understand that the military presence is essential in such a delicate region, and the pacific nature of the Arctic can be kept exclusively under certain conditions.

Finally, climate change is a cruel reality, and the Arctic region is the first area its effects are visible in; in September 2018, the polar cap still occupied a semi-continental space with 4.7 million square miles. Compared to the season average, there was 1.7 million square miles more of water. In addition, the ice is not only less expanded, but it is also thinner and more fragile. If this extreme environmental condition helps on one side to open new economic opportunities and routes, on the other side, it has a dramatic impact on the environment, and it can pose some limitations on commercial activities as

[9] Mikhail Gorbachev, " Ceremonial meeting on the occasion of the presentation of the order of Lenin and the gold star to the city of Murmansk”, (Presentation, Murmansk, 1987).
[10] Special military Russian forces

well; some backflows emerge. In this regard, it is possible to illustrate the risks of the glaciers' melting on economic activities. First of all, the thawing of permafrost risks make the ground unstable, threatening the stability and the possibility of future infrastructures' building; there is a risk of triggering accidents such as the disastrous one that occurred in May 2020 in Norilsk (Russia). On that occasion, a tank, built right on the permafrost, suddenly collapsed, releasing more than 20 000 tons of fuel oil that is now being released into the environment, causing an environmental disaster of immense proportions. Moreover, the ice melting impacts shipping activities as well; the glaciers are composed of fresh water, which has a lower specific gravity compared to the salt one; when the fresh water mixes with the salt one, because of glaciers' increasing thawing, the latter reaches a lower specific gravity. Consequently, the ship floating decreases and the ships' loading capacity reduces. The implicit consequences would be transporting a lower number of containers in order to avoid on the one hand, an overload of goods and, on the other hand, the risk of ship's sinking. Therefore, it is possible to affirm that the economic revenue from that shipping, under these conditions, would decline. Climate change effects can have a serious impact on the precarious balance of this region both at environmental and economic level. States have to focus on all the possible outcomes and scenarios that this fragile region could offer.

The Arctic is composed of different elements and characteristics, both charming and dangerous at the same time. The centrality and the fragility of the Arctic region are strongly interconnected; one cannot exist without the other. States are trying to take advantage of the new opportunities that are emerging from the region. However, they have to bear in mind its backflows and precariousness when undertaking activities and applying strategies. The complex reality of the Arctic makes it the new center of international security; economic, geographical, military, and social issues are at stake, and the changing balance, even if of only one of these elements, can influence all the others. "The Arctic is central because it is fragile, and it is fragile because it is central." [11]

1.1.1 Climate change effects in the region

Climate change affects the Arctic in more drastically and importantly way than in all the other areas of the world, creating severe consequences: sea-ice cover decrease, melting of the ice sheet, and glaciers and thawing of permafrost. Since 2011, the values connected to the ice thickness, extent, volume, and duration are getting worst. The cold Arctic is going through a fast transformation with significant consequences. Although the Arctic occupies a relatively small area compared to the rest of the globe, it has a vital function for the climatic balance of the planet. The alteration of the Arctic

[11] Federico Petroni, "Centralità E Fragilità Strategica Dell'Artico", *LIMES Rivista Italiana Di Geopolitica*, 2019.

phenomena, such as the thermohaline circulation[12] and the albedo effect, influenced by climate change, has an important impact on the global climate system. The albedo effect is a surface's capacity - in this case, the sea ice - of reflecting solar radiations; this depends on the type of surface and on its color, which can range from white, capable of reflecting all radiation, to black, capable of absorbing all radiation. From this, it can be deduced that albedo is one of the crucial factors involved in the earth's radioactive balance[13]. If a surface can reflect more solar radiation, it will result in less absorption of heat and, therefore lower temperatures. It is not by coincidence that the geographical areas registering a high percentage of albedo coincide with the coldest areas of the Earth, such as the Poles, where the combination of snow and clouds leads to the highest recorded albedo peaks. However, the current increasing temperatures reduce the "white" part of the Arctic, the ice, increasing the dark area corresponding to the amount of water, increasing the absorption of heat, and increasing temperatures and ice thawing. The loss of reflectivity of snow and ice sheets is currently more than double the projections of the most crucial climate models. In the same way, the thermohaline circulation is being reduced because of climate change effects; global warming is causing the interruption of this circulation with the risk of amplifying climate change effects with catastrophic consequences. "The circulation moves the warm water from the surface of the southern hemisphere toward the North Pole; between Greenland and Norway, the water cools, sinks into the deep ocean, and begins flowing back to the south."[14] This movement carries an important amount of heat toward the north, and it has a crucial role in preserving the current climate. Some studies carried in Greenland demonstrate how the thermohaline circulation has been interrupted, causing climate changes in the region and a decrease of 7°C in the Greenland temperatures in several decades.

"Since 2011, the Arctic reached incredible temperatures never recorded before; its warming rate was twice faster than in the rest of the globe; in 2018 the Arctic reached the third-highest temperature ever recorded since 1900."[15] In 2016, the temperature was 5°C warmer than the average from 1981 to 2010, 2°C warmer than the 2008 record, and the temperature from October to December was 6°C warmer than their seasonal monthly average. This increase in temperatures leads to even more frequent and drastic events in the region: in Alaska and Northeaster Russia, in autumn and spring, the seasons are getting warmer while the extreme cold in winter is reducing its lifetime. The 2020 annual Arctic Report Card presented in December illustrated concerning data: 2020 has been defined as the

[12] Large-scale density-driven circulation in the ocean, caused by differences in temperature and salinity. In the north Atlantic, the thermohaline circulation consists of warm surface water flowing northward and cold deep-water flowing southward, resulting in a net poleward transport of heat.

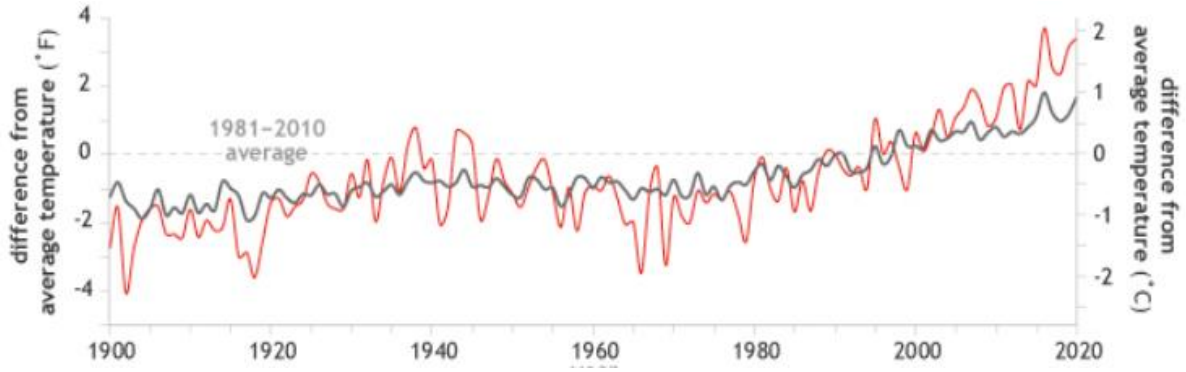
[13] The balance between absorption and release of heat between the Earth and solar radiation

[14] James Kloeppel, "News Bureau | ILLINOIS", *News.Illinois. Edu*, 2004, https://news.illinois.edu/view/6367/207427.

[15] *Arctic climate change update 2019. An Update to key findings of snow, water, ice and permafrostin the Arctic (SWIPA) 2017*, Arctic Climate Change (Tromsø: Arctic monitoring and assessing programme, 2019).

second-worst year of the Arctic following 2016, since the 1990 recording in the region. Average sea surface temperatures in August 2020 were 1-3°C warmer than the August average for 1982-2010. This was the case over most of the Arctic Ocean, with hot temperatures in the Laptev and Kara Seas. Not surprisingly, the Laptev Sea in the Russian Arctic marked its negative peak in 2020 in ice formation. Indeed, highly temperatures across Siberia during spring 2020 resulted in the lowest June snow extent across the Eurasian Arctic observed in the past 54 years. "A further monthly mean air temperature record high was set in July at Svalbard Airport (9.8°C), which is 0.8°C above the previous record value from 2016 and 3.4°C above average. Ny-Ålesund also set a similar record in July (8°C), which is 0.7°C above the previous record value from 2019 and 2.7°C above normal."[16] According to a new study published in Nature Climate Change Journal, temperatures in the Arctic have risen by an average of one degree per decade over the past four decades, with peaks identified by researchers in the Barents Sea and near the Svalbard archipelago in Norway. In these two areas, average temperatures have risen even faster, by 1.5°C per decade.[17]

The graph below shows how annual temperatures over the Arctic (red) and the entire globe (grey) compared to the 1981-2010 average. The graph underlines how 2016 brought warmer temperatures to the Arctic than the most recent meteorological year, 2020. Temperatures from October 2018 to September 2019 are now in third place.[18]



NOAA, Climate.gov, 2020

https://www.climate.gov/news-features/featured-images/2020-arctic-air-temperatures-continue-long-term-warming-streak

[16] James E. Overlnad, Menghua Wang and Thomas J. Ballinger, "Arctic Report Card 2020: Surface Air Temperature", *Arctic Report Card 2020* 4-5 (2020).

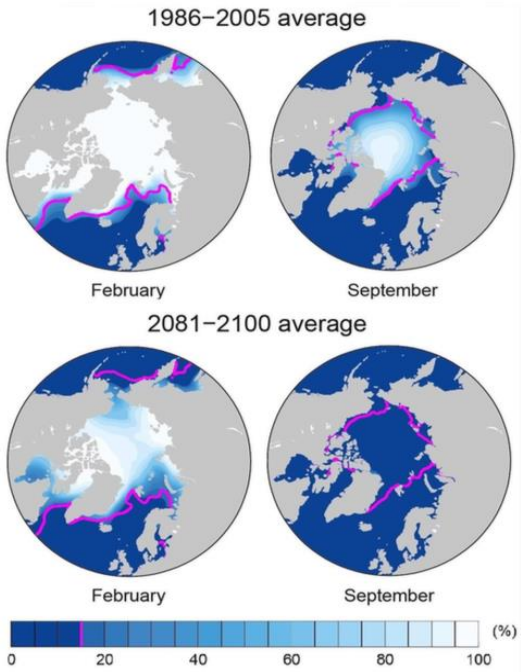
[17] Eystein Jansen et al., "Past Perspectives On The Present Era Of Abrupt Arctic Climate Change", *Nature Climate Change* 10, no. 8 (2020): 714-721, doi:10.1038/s41558-020-0860-7.

[18] Michon Scott, "2020 Arctic Air Temperatures Continue A Long-Term Warming Streak | NOAA Climate.Gov", *Climate.Gov*, 2020, https://www.climate.gov/news-features/featured-images/2020-arctic-air-temperatures-continue-long-term-warming-streak.

As a further consequence of global warming, the ice is becoming thinner with a 65% decline in 1975-2012 and keeps having a negative trend. The minimum sea ice extension record has been reached in 2012, while the maximum extension occurred in 2016. In 2020, the winter extension was the eleventh lowest, and the summer one was recorded as the second-lowest. The Arctic Report Card of 2020 showed how "the maximum Northern Hemisphere sea ice volume in April 2020 was 18,785 km^3, approximately 1,000km^3 below the 2010-2019 average, and in October 2020, sea ice volume showed the lowest value (4.627 km^3) in the past 10 years because of the second largest summer loss of 15.215 km^3."[19] The studies confirm that the most severe scenarios predicted a few decades ago are being overtaken by reality; Arctic ice is disappearing at a rate no one would have ever imagined. Scientists studying the Arctic have concluded that the ice cap has now passed the point of no return; the snow accumulated each year is no longer sufficient to replace the snow and ice loss during the summer. This process aggravates the situation of 234 glaciers in the area in summer. The estimated rate is a loss of 13% of sea ice every decade compared to the 1981-2010 average, with a dramatic possibility of an ice-free Arctic area by summer 2030. The point of no return seems to be passed; indeed, Northern Siberia and the Canadian Arctic are warming three times faster than the rest of the world and Canada's last completely intact ice shelf no longer exists. The ice melting is upsetting the whole ecosystem: oceans rising, climate transformation, and food chain unbalance are just some of the possible scenarios that the non-stop thawing of ice is causing.

The image below forecasts the expected sea-ice concentration; the upper part of the graph shows the 1986-2005 average of ice concentration, respectively in February and September. The lower part shows the same period of the year's forecasts about ice extension in the Arctic region. The whiter is the ice, the more its concentration in the area. Worth of mention is the comparison between September 1986-2005 average and September 2081-2100 average: while in the first period the percentage of the sea ice was equal or higher than the 60%, in 2100 it is expected to be 0%. It is also evident the considerable ice reduction in the winter period comparing the two averages: from a 90-100% ice-covered average, the predictions expected a 60% cover. The pink line represents the satellite observed sea-ice extent in 1986–2005, and it is employed to stress the differences among the two analyzed periods and make the reduction perceived.

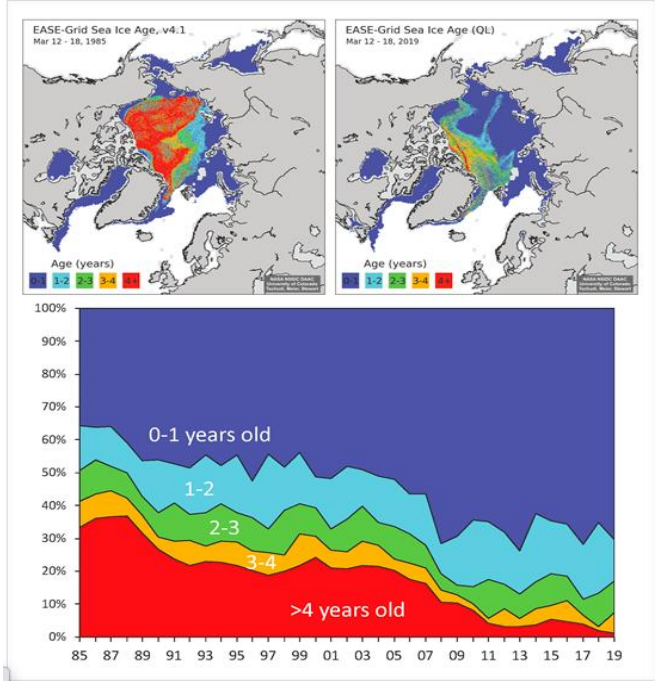
[19] Donald Perovich, Walt Meier and Simon Hendricks, *Arctic Report Card 2020: Sea Ice*, Arctic Report Card: Update For 2020The Sustained Transformation To A Warmer, Less Frozen And Biologically Changed Arctic Remains Clear, 2021.



Future of the Sea: Implications from Opening Arctic Sea Routes, Government office for Science, 2017
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/634437/Future_of_the_sea_-_implications_from_opening_arctic_sea_routes_final.pdf

It is important to underline how by now, the larger part of ice present in the Arctic is "first-year ice" and the old one, which has usually survived for several summers, is melting. The image below shows how the amount of "more than four years old ice" in the Arctic is being drastically reduced since 1985; indeed, in 2019, most of the ice was 0-1-year-old. 30 years ago, ice at least "4 years old" alone constituted about one-third of the Arctic ice sheet at the end of winter; "the total extent of the oldest ice decreased from 2.70 million km^2 in March 1985 to 0.34 million km^2 in March 2020".[20] According to the latest National Oceanic and Atmospheric Administration (NOAA) surveys, the old ice now makes up less than 5 % of the ice sheet. Newly formed ice is less compact and thinner, thus much more susceptible to melting due to higher temperatures; this affects the overall volume of available ice, as the measurements in recent years registered new record lows.

[20] Donald Perovich, Walt Meier and Simon Hendricks, *Arctic Report Card 2020: Sea Ice*, Arctic Report Card: Update For 2020The Sustained Transformation To A Warmer, Less Frozen And Biologically Changed Arctic Remains Clear, 2021.



NOAA, Climate.gov, 2019

https://arctic.noaa.gov/Report-Card/Report-Card-2019/ArtMID/7916/ArticleID/841/Sea-Ice

In the Arctic, the permafrost acquires specific importance: permafrost is the name of perennially frozen terrain found between far northern Europe, Siberia, and North America. Permafrost is found on land and under the ocean floor in areas where temperatures remain consistently below freezing. It covers about 22.8 million square kilometers in the Earth's northern hemisphere and its thickness can vary from 1 to over 1,000 meters. Since 2007, the permafrost warmed more than 0.5°C, and its melting has increased during summer. The permafrost holds 50% of soil carbon. Its thawing will contribute to further greenhouse gas emissions that have been trapped in the ground for millennia, further worsening the planet's already precarious environmental conditions. A contribution that has been insignificant in the last 60 years but that now is becoming dangerous. One of the main concerns connected to the permafrost melting is the emergence of pandemic and dangerous bacteria. A few years ago, the increasing temperatures melted the ice, wrapping a reindeer that died at the end of 1800, bringing its carcass to the surface; this carcass released some anthrax spores, an extremely toxic and lethal bacterium, reactivating them and killing a young man and contaminating a flock of reindeer.[21] Through the years, the region moved from the remote possibility of permafrost thawing to the real occurring threat.

One of the biggest concerns related to Arctic, is the increasing sea level; the melting of the ice cap keeps occurring due to the solid and constant greenhouse gas emissions that increase the

[21] Carlo Barbante, "Italia Chiama Artico", (Speech, 2021).

temperatures. Scientists have underlined how, despite the ice caps constitute only one-fourth of the world ice area, the water melting from them constitutes 35% of the actual global sea-level rise. 70% of the Arctic contribution to this phenomenon comes from Greenland, where 375 gigatons of ice per year are lost. One of the biggest concerns connected to this phenomenon is the actual threat of several submerged cities in the future. The increasing ice-thawing trend will submerge entire cities and, in some cases, megalopolis with consequent mass migration. "The damages costs for flooding in the world's biggest coastal cities could move from an actual $6 billion a year to $1 trillion a year by 2050."[22] At the same time, retreating glaciers and melting permafrost has already destabilized mountain slopes, and there has been an increase in "wet snow" avalanches in recent decades. Landslides will also become an increasing problem in the coming years. "Glaciers also contain toxic man-made chemicals such as DDT, heavy metals and black carbon, which spill into water bodies and decrease water quality in surrounding areas."[23] Scientists expect that the 2006-2100 period the sea level will grow by 25cm with a consequent disappearance of the minor glaciers by the mid-century. Between 2012 and 2016, sea levels rose about 1.2 millimeters per year, fueled by ice sheets melting, a 700% increase from two decades earlier. One of the main consequences of this phenomenon is the increase of precipitation in the Arctic, no more in the shape of snow, but rain that will have an important effect on water resources management and the freshwater flow in the Arctic Ocean. Indeed, the amount of fresh water in the Arctic has an increase by 11% compared to the average of 1980-2000. The transformation of the Arctic will last at least until the mid-century. Nowadays, it has a solid impact on ecosystems and biodiversity, creating significant changes and increasingly frequent events such as the increasing presence of algal blooms, the changing in the feed of marine mammals, and the changes in the migration patterns. In addition, the ecosystems will go through a process of disruption and hardships: the thawing of ice, and the increase of sea level will impact polar bears, ice-dependent algae and different species.

1.1.2 Decades ahead

According to projections of the 2017 Snow, Water, Ice and Permafrost in the Arctic report (SWIPA 2017), the next decades are not promising. During winter and fall of the next thirty years, temperatures are expected to grow by 4°C establishing new records with consequences, especially in northern Eurasia. The Arctic freshwater is expected to increase because of glacier melting, worsening conditions for the ecosystem, industries, and activities. Moreover, the SWIPA report declares how

[22] Antonio Massariolo, "Il Livello Dei Mari Sta Crescendo Più Velocemente Del Previsto | Il Bo Live Unipd", *Il Bo Live Unipd*, 2021, https://ilbolive.unipd.it/index.php/it/news/livello-mari-sta-crescendo-piu-velocemente
[23] Ibidem

the Arctic is expected to be completely free from ice by summer 2030, with a consequent increase in the thinning of ice in the winter season. The permafrost in the North Hemisphere is expected to be reduced by 20% by 2040, and it could be reduced by two-third by 2080 if greenhouse gas emissions are not reduced. Moreover, the SWIPA analysis estimates that, when all sources of sea-level rise are considered, not just those from the Arctic, the rise in global sea level by 2100 would be at least 52 cm for a greenhouse gas reduction scenario and 74 cm for a business-as-usual scenario. These estimates are almost double the minimum estimates made by the Intergovernmental Panel on Climate Change (IPCC) in 2013. The ecosystems will be in danger: some species will extinguish or will have to change living areas because of the drastic sea-ice thinning, while others could colonize new areas; conversely, phytoplankton and populations of non-native species may increase due to the warmer waters and reductions in sea ice.[24]

The decades ahead are characterized by hypothesis and studies on the opening up of new arctic routes, as it will be discussed in the last chapter; these opportunities apart from being a robust economic revenue will have a significant environmental impact for the coming decades. The shipping industry traditionally uses heavy gasoline, part of highly polluting fossil fuels such as CO_2 and black carbon. In the following decades, these fuels' emissions will have a global scale impact with a specific effect on an extremely sensitive and fragile area as the Arctic. This influences the natural phenomena such as reducing the before mentioned albedo effect and the destabilization of the precarious ecosystem of the region. The concerns for the next decades' opening of new routes can be summarized in two main impact's categories: regional impact and global one. For what concerns the first one, the increasing Arctic traffic will influence the region's fauna, favoring some spaces and penalizing the others. Moreover, the increase in sea level will impact on port facilities and energy corridors, becoming a problematic issue for the new opening routes. At global level, the main concerns are related to fisheries and oil spills. The ships' increasing activity in the region may damage the fish's environment; some of the risks are the discharges of pollutant substances and the possible introduction of new species in the region due to ships' ballast water poured into the Arctic Ocean ports. Meanwhile, the oil spill concerns are connected to the increased risk of possible ship collision in the region; the scientists have estimated how, due to the low rate of biological degradation, the oil could risk remaining in the Arctic water for more than fifty years. Moreover, the impact of oil on the ice pack may influence the Albedo effect. Finally, the last important concern connected to the increase of shipping in the region is the long period of darkness and sunlight; the former may create problems in oil spills cleaning process while the latter may favor the toxicity of possible oil spills, damaging aquatic organisms. The decades ahead are not promising from an environmental point of view; states'

[24] Ibidem

duty to manage and prevent dramatic consequences in the region. Therefore, it is clear how the Arctic region balance is essential not only at local levels but at global level. A recent economic study has evaluated how the Arctic changes will have a cost of USD 70–90 trillion for 2010-2100.[25] What clearly emerges from the SWIPA 2017 analysis is the urgent need to mitigate the effects of climate change. The most urgent action that needs to be made is stabilizing arctic warming, with a clear cut in the greenhouse gas emission, the cause of most of the analyzed phenomena. Although the changes in the Arctic are expected to last at least until mid-century, this cut could start reversing the trend or slow down the changing process. Sticking to the Paris Agreement may permit to stabilize the loss of snow cover and permafrost, reducing the worst scenario of a business-as-usual approach.[26]

1.2 The Arctic governance

The Arctic Five is the five littoral states of the Arctic (United States, Russia, Norway, Greenland and Canada) that deal with Arctic matters. Specifically, they mutually negotiate and deliberate on the most critical issues and topics at stake. It is fundamental to underline how this group of states is not a separate entity from their states' power, nor it is in contrast with them; moreover, there is not a permanent regulatory structure or arrangement in this group. It is just a label attributed to how these five states decide to organize and meet based on common geographical location, and consequently, interests. Nonetheless, the importance and the relevance of the group and its meetings should not be underestimated; the decisions and gatherings of these states have a strong influence and repercussion on the whole Arctic region.

Despite the fact that the bilateral and multilateral diplomatic communications are the most frequent and used methods of contact among the five Arctic states, the pick of diplomacy occurs during formal summits where important issues need to be decided according to all the actors involved. The most essential summits the five Arctic states took part in are Ilulissat, Greenland (2008), and Oslo, Norway (2015). These gatherings ended up with important declarations for Arctic states.[27] The Ilulissat meeting produced the Ilulissat declaration through which the five Arctic states provided the basis for handling and managing the Arctic Ocean; indeed, the framework provided: "*a solid foundation for responsible management by the five coastal States and other users of this Ocean through national*

[25] Dmitry Yumashev et al., "Climate Policy Implications Of Nonlinear Decline Of Arctic Land Permafrost And Other Cryosphere Elements", *Nature Communication*, 2019.
[26] *Snow, Water, Ice And Permafrost In The Arctic (SWIPA) 2017* (Oslo: Arctic Monitoring and Assessment Programme (AMAP), 2017).

implementation and application of relevant provisions". [28] Moreover, the declaration affirmed how states would have "*taken steps in accordance with international law both nationally and in cooperation among the five states and other interested parties to ensure the protection and preservation of the fragile marine environment of the Arctic Ocean*";[29] finally the declaration highlights the will of the five Arctic states to keep cooperating with the most important Arctic organization, the Arctic Council. In 2015, the Oslo declaration reached an important result in the prevention of unregulated high sea fishing in the Arctic Ocean; this was a non-binding regulation addressed to the five Arctic states in order to carry out actions to "*conduct commercial fishing in [the high seas portion of the central Arctic Ocean] only pursuant to one or more regional or subregional fisheries management organizations or arrangements that are or may be established to manage such fishing in accordance with recognized international standards*".[30] The relevance of these declarations lies in the cooperative and non-binding approach that the five Arctic states put into practice through the years, always keeping and fueling the pacific framework of the region.

Next to the Arctic Five group, there is a further Arctic category: the Arctic Eight. The Arctic Eight include the previously mentioned five Arctic states plus Sweden, Finland and Iceland. All these eight states make up the Arctic Council. The Arctic Council was created in 1996 after the Ottawa declaration in Canada; "the Arctic Council is an intergovernmental forum that promotes cooperation, coordination, and interaction among Arctic states, indigenous communities, and other Arctic inhabitants on common Arctic issues, particularly issues affecting environmentally, socially, and economically sustainable development."[31] The Arctic Council has not a programming budget, but it is constantly financed by the Arctic states, sometimes accompanied by a contribution from other entities. Moreover, the Council's guidelines cannot be enforced and imposed; the duty is in the hand of every Arctic state, and the decisions inside the Council are taken by consensus. One of the most important decisions related to the creation of the Arctic Council is the impossibility of discussing military security. The declaration affirms: "the Arctic Council should not deal with matters related to military security".[32] However, the terminology "should not" leaves some space for a future change of direction in the Council;[33] in addition, this somehow contrasts the nature of the Arctic Five that did not put any limits to their issue's discussions. Differently from the Arctic Five, the Arctic Council gatherings can produce binding agreements for the member States, such as the 2009 Agreement on

[28] Illulisat Declaration, 2008
[29] Ibidem
[30] Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean, 2015
[31] "About The Arctic Council", *Arctic Council*, accessed 16 March 2021, https://arctic-council.org/en/about/.
[32] Declaration on the Establishment of the Arctic Council, September 1996
[33] Ibidem

Cooperation and Rescue in the Arctic and the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. In addition to the eight states, the Council includes six organizations representing Arctic indigenous peoples, holding a permanent participant status, supported by the indigenous people secretariat. Furthermore, the Arctic Council includes six working groups; the working groups do the greater part of the job inside the Council. They constantly supervise the environment, study the pollution risks, try to prevent environmental accidents and they always promote the sustainable development of the region, the biodiversity protection and the custody of Arctic seas. Protection of the Arctic Marine Environment (PAME) Working Group and Sustainable Development Working Group (SDWG) are just two of the six groups involved. The working groups publish important scientific researches, studies and released recommendations. Finally, task forces and expert groups are an essential component of the Council; the former are composed of members from the working groups and the Arctic states. Their objective is to work on specific issues for a limited period, until they achieve specific results or agreements. Through the years, the Task Force on Arctic Marine Cooperation (TFAMC) and the Task Force on Improved Connectivity in the Arctic (TFICA) have been established to give a fundamental contribution to the development of the area. Instead, the expert groups cooperate with the working groups and provide advice on economic, social and cultural Arctic topics. Every two years, the Chairmanship of the Council rotates; the first country to hold the position was Canada, while for the biennium 2021-2023, Russia chairs the Council. The chair is the Minister of Foreign affairs of the country in charge; at the end of his mandate, the representative ministers of the Arctic states assess the Council's work and invest the new Chairman for the next two years. Finally, in the Arctic Council, it is possible to hold an observer status; non-Arctic states, intergovernmental, inter-parliamentary, global, regional, and non-governmental organizations can have this role. Since 2013, Italy has obtained this status. The Italian role as an observer has been a real turning point for the historical Italian Arctic interest and involvement. The observer status grants countries the possibility of meeting participation, contribution with scientific knowledge inside the Working Groups, project recommendation, and financial contribution. The Italian interests in the Arctic can be dated back to 1899 when the Duca Degli Abruzzi expedition was conducted and to 1926 and 1928 Umberto Nobile explorations. Scientific research is the main fuel of the Italian presence in the Arctic, thanks to the Dirigibile Italian research station located in Svalbard, Norway, opened in 1997, and THAAO international observatory in Thule in Greenland. Moreover, several Italian firms that will be later analyzed, hold an important role in the technological and transport sector in the Arctic. Italy is actively contributing to the Arctic Council through its participation in Working Groups and experts' groups, such as the Expert Group on Black Carbon and Methane (EGBCM). Our country's entry into the Arctic Council also meant gaining influence over

processes that would otherwise be the exclusive domain of regional actors. Italy, as an observer state, needs to comply with some Arctic Council essential principles, such as: the promotion of the local and Indigenous peoples' traditions and cultures and the participation in the economic development of the Arctic, in compliance with topmost environmental protection standards and sustainable development principles. During the preparatory years to the Italian application to the Arctic Council, Italy instituted the Arctic Task Force named "Tavolo Artico" currently chaired by Minister Carmine Robustelli; this is a coordination forum considered a real streamlined tool that can provide policy guidance on the overall national vision. In the forum, the ministries of Economic Development, Defense, Environment and Research, universities and research agencies debate. The issues discussed are related to the present and future Italian interests and participation in different activities in the Arctic; this forum is also a necessary tool to involve the Italian stakeholders and give them a precise role in the region.[34]

1.2.1 Artic Five vs Arctic Council

The overlapping membership of the Arctic Five in the Arctic Council is worth of being analyzed because of the positive and negative influences that the two entities have on each other's work. When the Arctic Five signed the Ilulissat Declaration in 2008, some concerns immediately emerged in the Arctic Council; the fear was a possible marginalization of the Arctic Council and reduced participation and contribution from the five states. The main problem that was immediately outlined was that the Arctic Five and their declaration were leaving out some essential actors that had a word in the regional issues; indigenous groups and working groups were just two categories that were left outside. The Arctic Five was perceived as an alternative forum discussing issues without the involvement of several additional actors and parties. In addition, the risk connected to the Arctic Five was the potential discussion of specific issues before their emergence in the Arctic Council, where, therefore, a higher number of voices and ideas would have needed to be heard. Consequently, preventive discussions and resolutions could emerge risking arriving at the Arctic Council already settled and altered in forms, concepts and final solutions. In this way, the Arctic Five could delineate their predominance on a specific regional area limiting the other actors' participation and commitment not only physically but also in the regional affairs.

Despite the concerns that emerged during the creation of the Arctic Five, it is possible to delineate a synergy between the two fora. If the two entities are perceived as places where the Arctic interests

[34] "Interview With Arctic Council Observer: Italy", *Arctic Council*, 2020, https://arctic-council.org/en/news/interview-with-arctic-council-observer-italy/.

are at stake, ideal cooperation may occur in order to provide the best solution possible for the Arctic governance; cooperation among the Arctic Council and the Arctic Five gives obviously better results than an individual approach. The presence of fewer actors in the Arctic Five allows discussing issues and topic in a faster and dynamic way, taking into consideration the real essence of the issues and the common interests of the five states, sometimes too far from International Organization or other entities involved in the Arctic Council. Because of their slenderness, the Five would paradoxically be more able to involve non-Arctic states when deemed necessary; indeed, differently from the Arctic Council, the Arctic Five does not have formal rules and may address whatever states they need. Instead, the Arctic Council, with numerous actors, is less engaging and less keen on defending non-Arctic states' interests; a clear example is the major indigenous organizations' involvement in the Arctic Council debates than the non-Arctic states one, undermining the latter responsibilities and engagement. This could become a problem since: "*states are the paramount actors and sole deposits of sovereignty in the international system, they jealously guard their status as sovereign equals above all other types of actors in international relations*".[35]

The main advantage of the Arctic Council is its administrative and permanent structure together with the constant participation of working groups that can produce a constant flow of Arctic data. This is obviously in contraposition to the Arctic Five structure, which in order to obtain specific research or data, needs to convene a special meeting. Furthermore, the decisions that come from the Council are more credible and solid because of the broad inclusion of different actors. However, this credibility emerges more among the three Arctic states that are not present in the Arctic Five, since the decisions and agreements they are part of are the only ones that can produce; conversely, the Arctic Five have a distinct possibility of producing their declarations and documents. If cleverly managed, the two fora can cooperate and compensate the other's shortcomings; the Council produces more relevant and practical documents. The Arctic Five emanate decisions that can broadly involve non-Arctic states because of the simpler structure of the forum. As mentioned before, the Arctic Five can discuss the issues before they arrive at the Arctic Council; initially, this has been perceived negatively, but in an optic of cooperation among the fora, it could be a tool to declare some countries' position already and streamlining discussions in the Council. Therefore, it is unlikely that the Arctic Five will start adopting binding international agreements; the Arctic Five will probably keep dealing with important issues mainly connected to the littoral states at a non-binding level to move them up to a binding level

[35] Biersteker, T.J. (2013). State, Sovereignty, and Territory. In W. Carlsnaes, T. Risse, & B.A. Simmons (Eds.), Handbook of International Relations (2nd ed.) (pp. 245-324). London, UK: SAGE Publications Ltd.

under the Council approval. Despite at first analysis the role with the Council may seem conflictual, it may lay the ground for smooth agreements.
In conclusion, the activities of the two fora, despite seeming opposite, are intertwined; the rules-free nature of the Arctic Five and the binding and well-structured apparatus of the Arctic Council can be complementary in the activities aimed at reaching the best international governance for the Arctic region.

1.3 UNCLOS as legislative tool for the Arctic

Unlike Antarctica, the Arctic is not governed by a specific international treaty. Its legal regulation is subject to coastal states' jurisdiction within the international legal framework of the United Nations Conference on the Law of the Sea (UNCLOS) signed in 1982 in Montego Bay and other specific international treaties. UNCLOS is in force among 175 states, including the Arctic Five, apart from the United States that did not ratify the Convention. This Convention regulates the international relations among states in the sea domain, and it is the output of the third United Nations conference on the Law of the Sea. UNCLOS provides a legal framework for the world's oceans. The most crucial topics it regulates are: international communication, the peaceful use of the sea, fair and efficient use of marine resources, conservation of living marine resources, and the study, protection and preservation of the marine environment. UNCLOS Convention needs to be underlined for its important introduction and implementation of states' maritime zones in order to manage the states' surrounding waters better; the defined zones are six: internal waters, territorial sea, contiguous zone, exclusive economic zone, continental shelf, and high sea. The baseline is a preliminary concept necessary to explain the maritime division, and it is the line along the coast from which the seaward limits of a state's territorial sea and certain other maritime zones of jurisdiction are measured. The first jurisdictional levels defined by UNCLOS cover the internal waters, which include maritime spaces within the base line and the territorial sea, which extends 12 miles from the baseline. The subsequent zones are the contiguous zone, extended for 24 miles from the baseline, and the exclusive economic zone (EEZ) that, is up to 200 nautical miles; the continental shelf is the submerged part of the continents that extends from the coastline to a depth established by Convention. As a natural extension of the mainland, the extent of each state's continental shelf depends on the geological conformation of its coastline. Finally, the high sea is a portion of the sea under the jurisdiction of no states where every state can have access; indeed, the customary international law established the principle of the 'freedom' of the high seas. Through the exclusive economic zones established by the Convention, each coastal state has sovereign rights for the management of natural resources, jurisdiction over the installation and use of artificial or fixed structures, scientific research, protection,

and conservation of the marine environment. Roughly 90% of the offshore Arctic resources are located in the exclusive economic zone of the Arctic states, whose extension covers most of the Arctic Ocean. The continental shelf has a crucial role in the Arctic region; in that specific maritime zone, there is a high presence of mineral resources, especially hydrocarbons. Therefore, the continental shelf is the natural submerged extension of the continent and has become more and more important as technology allowed its exploration and exploitation. This explains the great interest shown by many states during the drafting of UNCLOS in this regard: the purpose was to ensure the exploitation of resources placed right on the continental shelf.

UNCLOS indirectly included Arctic as a will of Canada, the Soviet Union and the United States, planning to negotiate a private Arctic agreement among them in the future. The outcome was the inclusion of article 234, which states: "*Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence*."[36]

Despite there was no specific reference for the Arctic region, UNCLOS Convention was sufficient to satisfy the Arctic countries for more than two decades; UNCLOS was perceived as an agreement part of a broader framework of regional agreements to regulate maritime activities and the management of the resources. Since the mid-2000s, the Arctic Ocean governance started to have some problems that the UNCLOS was not perfectly able to deal with; climate change was presenting new challenges that the 1982 Convention did not directly address; therefore, art. 234 does not correctly manage the ice-covered area of the Arctic. The article lacks in asserting maritime jurisdiction over ice-covered waters and cannot regulate the consequent Arctic Ocean navigation. The definitions present in article 234, such as "where severe climatic conditions", "most of the year" and "obstructions or exceptional hazards to navigation" does not correctly and clearly explain what an ice-covered area means. The word "where", as the introduction of different climate conditions, opens two possible interpretations: either try to define the geographical area where the extended jurisdiction of coastal states, is applicable or it hypothetically substitutes the word "when". There are different arguments supporting the two possible interpretations, but it is clear that this leaves a "free to interpretations legislations".

[36] Art. 234, United Nations Convention on the Law of the Sea

The second interpretation seems insidious because it would mean that states should apply different sets of rules according to the season and weather conditions; consequently, different interpretations have been adopted. Canada and Russia, in order to define their domains, referred to the first one. This created a different prospective about the legal status of the polar sea routes on each side of the Arctic Ocean.[37] In 1985 Canada included the Arctic Archipelago of Canada in its territories by drawing a straight baseline around it; in this way Canada claimed the North West Passage in Canadian internal waters and therefore, under its sovereignty. Moreover, Canada affirmed that the internal waters claim was also established based on an historical principle that comes from the exclusive presence of Canadian Inuit in the territory. This decision has been strongly criticized by the international community, especially by the United States. The US was asserting that these waters, and therefore the Northwest Passage, needed to be considered international straits according to two main elements: the geographical element (a strait is a natural passage that link two seas) and the functional element (a strait is a commonly used passage used by international navigation). In the past, this conflict created two crises among the countries: in 1969 first and then in 1985 when an American super tanker and an American ice breaker navigated the Passage without asking permission from Canada.[38] In the same way, Russia affirmed that most parts of the Arctic straits are internal waters based on the same Canadian principle: drawing extended baselines. According to the Russian Basic State policy, a 2000 document where the main Russian interests over the Arctic are contained, the North Sea Route is defined as Russian primary national interest in the Arctic.[39] Moreover, its importance was stressed in the 2013 Russian Development Strategy of the Artic too, where it is affirmed that in order to improve the shipping strategy in the Northern Sea Route it is necessary to take several steps such as a system of tariff regulations for icebreaking, and the development of a mechanism of insurance.[40] This shows how the unclear nature of article 234 allowed Canada and Russia to define their domain and jurisdiction over two international routes. Their stands contrast the principles of free navigation, mainly because, in order to reach the high seas of the Arctic Ocean, it is necessary to pass through the territorial seas or EEZ of the littoral states' Arctic routes. Consequently, non-Artic states and some Arctic states' ships suffer a limitation accessing the Arctic Ocean and the nearby seas. A further limitation and misinterpretation that could emerge from article 234 refer to "the best available scientific evidence" that needs to be used by coastal states for

[37] "Article 234 UNCLOS And The Polar Code The Interaction Between Regulations On Different Levels In The Arctic Region" (University of Oslo, 2014).
[38] "Straight Baselines", *Option.Canada. Pagesperso-Orange.Fr*, 2020, http://option.canada.pagesperso-orange.fr/NWP_baselines.htm.
[39] Basics of the State Policy of the Russian Federation in the Arctic for the Period till 2020 and for a Further Perspective, 2008
[40] The Development Strategy of the Arctic Zone of the Russian Federation and National Security for the period up to 2020, 2013

navigation and protection of the maritime environment; this sentence affirms how the scientific standards need to be accepted at an international level and cannot be exclusively produced on single coastal states scientific and research data. Consequently, this stance has been interpreted by different scholars as a way to control states' measures.

Climate change is threatening the ice pack of the area, and therefore, the application of article 234 may vary according to ice extension over the Arctic Routes. In the same way, there are doubts about the future definition of the arctic routes as ice-covered. The aim of the article will be uncertain. A further problem will be connected with the determination of the Arctic continental shelf; UNCLOS provides that each state may define, unilaterally and without outside interference, the extent of its shelf within 200 nautical miles of the coast. A further extension, but not exceeding 350 nautical miles, may be requested; this determination lies in the hand of the Commission on the Limits of the Continental Shelf (CLCS). The states present their request that the CLCS than validates. In the future, the ice melting will probably imply, despite the binding nature of CLCS recommendations, that the delimitations established will be changed due to newly available data and environmental evolution.
In conclusion, UNCLOS has been able to regulate the Arctic maritime environment for a couple of decades. However, the global warming and the consequent climate change are posing severe threats and are altering the environment, posing essential obstacles. The Convention does not really consider the actual environmental changes and mutations of the region; this complicates maritime zone and continental shelf delimitations, creates a potential conflict over Arctic expeditions, shipping and management of resources. UNCLOS's ability to regulate the future Arctic governance is doubtful.[41]

1.4 IMO Polar Code to manage the increasing presence in the Arctic

Data affirm how the polar shipping will grow, especially in the Arctic, both commercially due to the numerous deposits of natural resources, and in terms of tourism due to the beauty and fascination of these areas; they will be facilitated by the possibility of drawing new routes as the ice melts, also alternative to the Suez Canal, between Europe and the Far East, with significant reductions in the distances to be travelled. All these challenges will have to be realized without compromising either the safety of life at sea and the sustainability of polar environments, or protecting resident populations; indeed, in this fragile environment, ships could create a further and severe damage to the ecosystem. The Code implies an enormous challenge that will influence the world economy in

[41] "ARCTIS | Law Of The Sea", *Arctis-Search.Com*, 2009, http://www.arctis-search.com/Law+of+the+Sea.

the coming decades, namely how to combine the development of maritime traffic in the Arctic areas preserve an environment that has remained intact until now. Furthermore, ships operating in these environments are subject to outstanding risks threatening their Artic activities: bad weather conditions, difficulty in communications, accessing the area and the lack of nautical charts. These operating conditions implement the possibilities of incidents in the region. Despite the predominant role of the Arctic Council, IMO had a crucial role in the maritime shipping regulations in the Arctic. The International Maritime Organization is the specialized agency of the United Nations charged with "responsibility for the safety and security of navigation and the prevention of marine pollution from ships."[42] In 2017, the IMO emanated a Polar Code; this Code covers the full range of issues relating to navigation in the waters surrounding the two poles: "vessel design, construction and equipment, operational and training issues, search and rescue, and, equally important, the protection of the unique environment and ecosystems of the polar regions".[43] IMO's Code integrated, not substituted, the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL) adopted in 2014 and 2015. These two Conventions established globally applicable minimum standards, but the Polar Code is fundamental in order to protect the navigation for the challenges that the Arctic region can present. The Code affirms and recognizes how the Arctic coastal communities may be in danger and how the ecosystems are victims of human activities, such as shipping and ground exploitation. Therefore, the Code lists the sources of risk for this region: ice, low temperature, high latitude that influences the navigation and communication systems and continuous period of dark or daylight, lack of crew's experience in this outer region and extreme weather conditions. The Polar Code includes two mandatory sections (IA and IIA) regarding security and pollution prevention to "reduce the likelihood of an accident" and two different sections (IB and IIB) with recommendations. The Polar Code would probably enter into UNCLOS article 211 definition of a "*generally accepted international norms and standards*" for environmental protection; in this case, states are responsible for its enforcement under a UNLCOS obligation and the coastal states may require compliance with its conditions. The Polar Code sets new guidelines and rules for the expected increase of vessels in the Arctic waters due to ice retreat and it compensates the UNCLOS norms; indeed, when the norms established in the 1985 convention result limited, the Polar Code fills the gap and increase the security and safety of the region. It is evident how the Polar Code's approach is new and broader since it considers a changing of the environment and possible future prospective. The Code covers the full range of maritime issues such as search and rescue, ships' construction and equipment. An important element introduced by

[42] "The International Maritime Organization (IMO). GMDSS Radio Survey Blog", *Gmdsstesters.Com*, accessed 11 March 2021, https://gmdsstesters.com/radio-survey/general/the-international-maritime-organization-
[43] International Code for Ships Operating in Polar Waters, 2017

the Code is the request to ships that are willing to operate in Arctic waters applying for the Polar Ship Certificates; this certificate sets a classification of the ships according to three ice classes of vessels in connection to the Arctic ice conditions; the Category A ships include all those ships that are built for conducting activities in polar water in medium-first-year ice with a thickness > 70cm; Category B ships are allowed to operate in at least thin first-year ice with an ice thickness > 30 cm and Category C ships are able to conduct activities in open water where ice conditions are less strict than in the last two categories. The classification of the ships occurred after an assessment of ships' capabilities, of the operative conditions and of the risks that ships may face in Arctic waters.

IMO has been quick in providing an efficient answer to the international communities' concerns over the region changes. Moreover, the Polar Code foresaw the increased interests of new states, Arctic and non-Arctic, in the region due to the changing conditions of the sea and ice cover. Therefore, it was necessary to establish a specific set of rules to perfectly regulate the increment of attention and presence in the Arctic. States such as Russia and China are changing their attitude toward the region; this can mean an increasing presence of ships, mining activities and research in the region with a consequent increase of the human presence and human impact. It resulted necessarily for IMO to introduce a code that could have prevent, as much as possible, further damage of this fragile region. The next chapter thus analyses the role of the major players in the Arctic region with their consequent interests and activities in the area.

2. Major players in the Arctic

2.1 Russian comeback in the region

The Arctic is a decisive region for Russia. Since recently, the Russian government is engaged in the difficult task of developing its potential to the full and defend the area against the threats. The strategic link that has always connected Moscow with its immense region has recently taken on priority value in the design of Russian decision-makers; they are forced to come to terms with the West's tenacious hostility and the perennial need for energy resources that the polar seabed contains in large quantities and that conditions their economy. Russia feels the Arctic as naturally part of its identity and interest; the Arctic is a Russian historical-spiritual concept, closely related to "Nordicity" and includes all the territories in which the peoples who possess a particular "Nordic spirit" reside. Kremlin is interested in a specific definition of the Russian Arctic. For some time now, the official documents include the concept of "Arctic Zone of the Russian Federation" that finds the basis in the Soviet period. Precisely define the Russian limits of its Arctic possessions is of primary importance for Moscow; it is according to the regions and municipal districts that are part of its identity and history that Russia carries out federal programs of social and economic development, implements infrastructure projects and promotes facilities for the people living in those territories. Moreover, a specific definition of its possessions and boundaries favors a territory that it is not isolated anymore. Russian coastline accounts for 53% of Arctic Ocean coastlines, and of its 145 million inhabitants, 2 million live in Arctic areas. In recent times, the Russian interests in the Arctic are increasing. Russia has always been present in the region, especially during the Cold War, with several confrontations through submarines and military bases; moreover, the Arctic was the mainstay for Russia's nuclear Northern Fleet. Since the fall of the Soviet Union in 1991, for a decade, the Russian interests in the region decreased; during the 1990s, the newly born Russian Federation gave few attentions toward the North. After the lost contraposition with Washington, Moscow did not have the means to keep a military presence at the same level as the previous years; moreover, it did not have the tools to develop its Arctic side. Inadequate financing, a significant decrease in submarines and military ships, stop of explorations plan, and shutdown of several enterprises occurred. The passages through the Northern Route went to a drastic reduction: loaded goods went from 6.6 million tons in 1987 to 1.65 million tons in 1996. Meanwhile, some scholars believed that the Russian withdrawal from the Arctic would have been definitive and a possible new balance in the region would have been settled until 2050. Indeed, several military analysts from Finland and Sweden underlined the decline of military capabilities of Russia, its consequent reduction of technical, and scientific ability and the scientific

and technological backwardness in the region; they believed that the Russian presence would have been just an element of the past. In the eyes of experts and scholars, these elements did not allow any possible second chance to the country to have a role in the region. Although Russia had to start from scratch in several sectors because of the years of inactivity, it came back in the region. It occurred first in 2001, with the release of the first strategic plan for the region and then, in 2007, when Moscow left a significant and discussed sign of its return: two submarines placed a Russian flag on the Lomonosov underwater rid. That flag symbolized the Russian return in the region and a message of a scientific and economic new interest in the Arctic. In 2009 Russia affirmed that they would not have given the Arctic to anyone; therefore, its comeback began to be connected to military and civilian new infrastructures, research programs, testing of new technologies, and military deployment. This created several concerns among the neighbor countries that started to closer analyze all the Russian moves in the region.

The main elements that guided the country in the comeback in the region were military and economic aims. After the end of the Cold war, NATO took control of the former Soviet and Warsaw Pact military infrastructures, which strongly reduced Russian power and the possibility of maneuver. Consequently, the attention of Russia moved toward the Arctic. The North of Russia has always been the most fragile and sensitive part of the country. It resulted a perfect target for the intercontinental ballistic missiles: indeed, the Americans had their ballistic missile submarines in the Barents Sea, dangerously close to Russian costs. Moreover, the Russians understood that the Arctic Ocean would have given access to all the oceans of the world, and its protection resulted essentially for the international missions; Russia had already lost several ports in the Black Sea and the Baltic Sea after the collapse of the Soviet Union and it did not want to waste a precious occasion in the Arctic. From an economic perspective, Russia developed the idea of exploiting as much as possible all the reserves that the region could offer in order to enrich the country; in 2008, the main economic aim set during the Russian return in the region was the principle of "transforming the Arctic into the country's strategic base for natural resources in the 21st century" [44]. During the years, Russia developed several different strategies and policies in order to maximize its advantages in the region and reach the established goal.

The first Russian strategy for the Arctic was the 2000 "Basics of the Russian Federation State Policy in the Arctic" (namely Basics); Putin signed this policy, and it was the basis for developing a

[44] Nazrin Mehdiyeva, *Russia'S Arctic Papers: The Evolution Of Strategic Thinking On The High North*, Russian Studies Series 4/18 (NATO defense college, 2018), https://www.ndc.nato.int/research/research.php?icode=567.

modernization strategy for the military sector in the region since the USSR collapse. Putin attributed the Arctic region the role of the future base of national resources, underlining its economic potential and the possibility of exploitation. However, the main focus of the policy was the military sector: it declared that all the activities carried in the Arctic should have been conducted for the defense and security to the maximum degree. For instance, one of the leading military priorities was to test the optimal functioning of seabed nuclear forces in order to undermine all the possible threats against Russia. In the framework of this strategy, several texts have been adopted, such as a policy plan for naval construction and a development plan for naval transport in Russia, but hardly implemented.[45]
In 2008, a new strategy for the Arctic had been approved. President Medvedev signed the "Foundation of State Policy of the Russian Federation in the Arctic to 2020 and Beyond" (namely Foundations). This has been one of the most important policy that has ever been discussed about Arctic since its publication occurred immediately after the before mentioned 2007 Arctic expedition. The policy's aim was broadened and the military apparatus was not the primary aim anymore; further national interests were set. These included the Arctic area as a strategic region of socio-economic development in strict correlation with resources availability, environmental preservation, and the preservation of the region as a peaceful area.
Furthermore, the Northern Sea Route was for the first time defined, in terms of communication and transport, as a route of strategic interest for Russia. It is important to underline how the Foundations still mentioned and highlighted the importance of the military sector in the region in order to create a sphere of military security. Nevertheless, the aim and prospective have been enlarged compared to the 2000's strategy; it was more open toward cooperation for security aims than favoring a military clash. The strategy mentioned how Arctic resources could have been a tool for Russia to be a great power, comparing it to the central Asia and Caspian seas energy battlegrounds. An important place was given to the Russian navy: the strategy declared how Russia would have re-established a warship presence in the region. This was extremely important since the Northern Fleet cannot enter the Atlantic Ocean if not passing through specific choke points connecting Norway, Iceland and Greenland.[46]
The following update is dated to 2013 when president Putin improved the Russian strategy for the Arctic announcing the "Development Strategy of the Arctic Zone of the Russian Federation and National Security for the period until 2020". This version delineated the goals, objectives and means of Russian strategy in the region in a more specific way. First of all, the North Sea route's role was highlighted as a fundamental economic corridor (Blue Silk Road); moreover, technology, science,

[45] Valdai Discussion club, *Russian Strategies In The Arctic: Avoiding A New Cold War*, 2012.
[46] Ibidem

telecommunication, and a modern information system were added to the agenda. Once again, the military-security priority emerged in the text: national interests' defense remained a priority for Putin. The Russian borders in the Arctic with a strong military air force and naval patrol and presence were issued. Further aims included airports' network modernization, modern telecommunication infrastructures and icebreaker fleet. Together with the Strategy, Russia released several programs to boost its implementation, and effectivity such as the Socioeconomic Development program of the Russian Arctic Zone up to 2020.[47]

The latest update regarding the strategic policy in the Arctic occurred in 2020 and it culminated with the document "Fundamental Principles of the State Policy of the Russian Federation in the Arctic until 2035". It is important to underline how this new strategy was announced at the eve of the two years Russian Arctic Council's presidency. Although the new strategy is largely a continuation of the previous one, the Russian domestic and foreign policy changes since 2013 are visible: the strategy discusses possibilities for international cooperation, but devotes more space to threat scenarios. Additionally, while the 2013 strategy mentioned civil society organizations as implementation partners, now they are absent. Climate change's prospective has changed too with a more aware approach toward the issue. In detail, the report defines the nation's interests, objectives and implementation mechanisms for the next 15 years. This shows continuity with the previous documents and strategies, and it still ensures territorial sovereignty and integrity. The program is based on stable "mutually beneficial" partnerships to reach goals and objectives in the region. Russia knows that cannot reach its ambitious economic goals without the economic support of other wealthier countries. The strategy delineates how the securitization and militarization of the region are still the main Russian concerns and, despite the Arctic Council does not accept military issues discussion, there is the possibility of a Russian attempt to enlarge the Arctic Council mandate in this regard. Russia could take in consideration and could try to sensitize countries about their lack of an institution that can discuss and deal with the militarization of the Arctic, an issue that in recent times it is acquiring growing relevance. In this regard, most Arctic states perceive the militarization of the region as a potential threat toward national interests and Russia could use these concerns for its advantage and open the Council's addressed topics.

The 2020 strategy deals with several different macro areas that will be analyzed in the following pages.[48]

[47] Marlène Laruelle, *Russian Military Presence In The High North*, Russia In The Arctic (Strategic Studies Istitute, US Army War College, 2011).
[48] Ibidem

2.1.1 Economy, energy plan and the NSR route

In June 2020, the Russian Energy Strategy for 2035 (ES) has been approved. It represents for Moscow and for all the regional actors involved in the Arctic, not only an economic but also a strategic document at a political level. The document approved by the government confirms the Russian ambition of playing a central role in the energy global markets thanks to its reserves. The goal is to allow Asia to overcome Europe as the foremost destination for energy products export. The 2035 ES outlines the main factors that will drive the internal development of the energy sector and the single energy sources; The main 2035 ES's five energy objectives are:

- Consolidation of Russia's position in global energy markets;
- Diversification of exports to Asian markets;
- Development of the domestic market;
- Reduction of energetic intensity and emissions
- Renewable sources sector development

The delineated aims are in line with the traditional Russian ambition and the new international sustainable goals: emissions reduction and an increasing role for renewable resources in the energy mix; in the ES outlined future scenario, the centrality of the natural gas will be indeed increased. Furthermore, pipelines' exports will grow by 144,8% in 2035 and the LNG is expected to grow by 471,1% moving from 26.9 bcm exported in 2018 to roughly 127 bcm in 2035.[49]

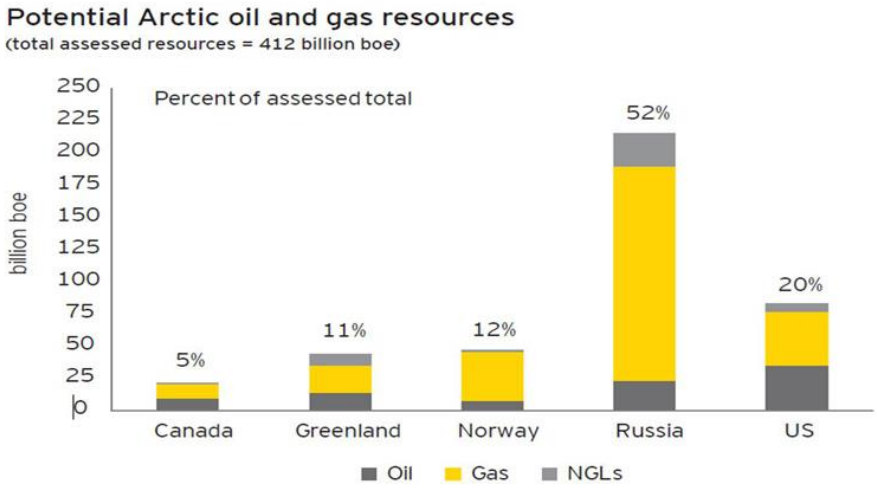
The Arctic is a fertile land of energy resources and raw materials, a good reason for Russia to try to take the maximum advantage from it. Moreover, the Arctic deposits of nickel, cobalt, copper, gold, diamonds, and other minerals make it an invaluable treasure chest to develop and save. Because of its abundance of oil reserves, energy resources, and raw materials, the Arctic is often referred to as the "New Gulf". Since 1915, Russia has been conducting exploration activities in the Arctic; around 20% of Russia's GDP is generated in the Arctic and the 22% of total exports come from the region. "Energy exports account for about half of the Russian state budget and two-thirds of total exports. In 2013, oil made up 33% of the value of Russia's exports, oil products 21%, and natural gas 14%."[50]

The mentioned richness needs to be added to the ones to be traced and extracted yet; it is estimated for hydrocarbons alone, at 90 billion barrels of oil and 47 trillion cubic meters of gas, most of which is found in Russia's Exclusive Economic Zone (EEZ), bordering the northern maritime basins. "They

[49] Leonardo Parigi, "La Strategia Energetica Russa Al 2035", *Osservatorio Artico*, 2020, https://www.osservatorioartico.it/strategia-energetica-russa/.

[50] Pami Aalto, "Modernisation Of The Russian Energy Sector: Constraints On Utilising Arctic Offshore Oil Resources", *Europe-Asia Studies* 68, no. 1 (2016): 38-63, doi:10.1080/09668136.2015.1113509.

are equivalent to roughly 14% of Russian oil and 40% of Russian gas."[51] The research and the exploitation of the huge riches under its seabed are the priority of the Russian leadership. The Kremlin is aware of the progressive depletion of continental hydrocarbon reserves, hence the key importance attached to energy resources in the Russian Arctic. The image below shows the different percentages of oil and gas resources in the Arctic expressed in billions of oil equivalent; it is clear how Russia owns a dominant position in the disposal of resources, creating important leverage for the country. As analyzed before, the lowest percentage of Russian disposal is oil with roughly 25 billion barrel of oil equivalent; the highest amounts of resources are represented by roughly 200 billion barrel of oil equivalent gas and the 225 boe NLG disposal. Russia holds a leading position in the sector, followed by US and Norwegian disposal.



Ernst & Young calculations from US DOE and US GS Data, 2013

https://www.safety4sea.com/wp-content/uploads/2014/09/pdf/EY-Arctic_oil_and_gas.pdf?__cf_chl_jschl_tk__=pmd_t0fnWXJDVtpy1R5uiMrBjOmbylgAvYsBob7tXqcHze0-1631115408-0-gqNtZGzNAhCjcnBszQb9

The goal of president Putin is to reach 30% of hydrocarbons' country production in the Arctic by 2050; this task is attributed to one of the most important Russian projects: the Yamal LNG plant.
The Yamal plant is a liquefied natural gas (LNG) plant located in the Yamal Peninsula, above the Arctic circle. The project has been launched in 2013 and it aims to exploit the onshore gas reserves of the Russian peninsula of Yamal for more than 4 billion barrels of oil. In order to achieve this goal, around 200 wells have been drilled and three liquefaction trains built. The LNG is sold to Europe and Asia with 15-20 years contracts. In the beginning, the main issue was that it was impossible to access

[51] Stanislav Pritchin, "Russia'S Untapped Arctic Potential", *Chathamhouse.Org*, 2018, https://www.chathamhouse.org/2018/01/russias-untapped-arctic-potential.

the site through sea or land routes; therefore, in 2011, a regional transportation hub started to be built including the port of Sabetta and an annexed international airport. In addition, in 2019, an LNG icebreaker tanker was built in order to ship LNG to the requesting countries. The route currently in use is known as the Northern Sea Route, and it allows ships to arrive in Asia through the Bering Strait in 15 days. This is an enormous advantage for Russia, considering that the traditional route through the Suez Canal took about 30 days of the journey. This aspect will be later analyzed in depth. Novatek, the Russia's second-largest natural gas producer, actually owns a 50% stake in the plant while the French energy company Total holds 20%.[52] Total defined the project as "one of the largest and most complex LNG projects in the world". The Arctic will provide Russia with a place as one of the leaders in the global LNG market. Indeed, Russia forecasts to increase LNG regional production from 8.6 million tons in 2018 to 43 million tons in 2024, 64 million tons in 2030, and 91 million tons in 2035. Moreover, Arctic production is expected to decrease domestic natural gas production, starting from 82.7% in 2018 to 82% in 2024, 81% in 2030, and 79% in 2035.[53] The Russian contribution in the region will significantly increase in the following years. Due to the commissioning of oil provinces and intensified platform development, the Arctic will supply up to 90% of all Russian gas and 25% of oil estimated trend. The resources' supply results thus the main element for enriching and developing the Russian economy. Therefore, the abundance of oil, gas and other renewable resources (e.g. water, carbon, hydropower, etc.) makes the Arctic an attractive territory. However, numerous criticisms have already been raised about the exploitation of the area, as the massive industrialization of the region could worsen the effects of climate change. This project should bring the Russian participation share in the global gas market from the actual 4% to around 20% by 2035, with an annual income that will contribute to Russian economy with over 30 billion dollars. [54]

A further necessary infrastructure that is warning all the other Arctic states is the Russia's first floating nuclear power plant, built in 2019. The Akademic Lomonosov plant was built by the Russian state-owned atomic company Rosatom, and entirely constructed in Pevek, in the remote region of Chukotka, in the Russian Far East. The floating power plant is replacing a coal-fired power plant and an old nuclear power plant that served the area. The project took ten years and cost an estimated 450

[52] Holly Ellyatt, "WORLD POLITICS Russia Is Dominating The Arctic, But It'S Not Looking To Fight Over It", CNBC, 2019, https://www.cnbc.com/2019/12/27/russias-dominance-in-the-arctic.html.
[53] Rosemary Griffin, "Russia Approves Arctic Strategy Up To 2035 | S&P Global Platts", Spglobal.Com, 2020, https://www.spglobal.com/platts/en/market-insights/latest-news/coal/102720-russia-approves-arctic-strategy-up-to-2035.
[54] Atle Staalesen, "Russia Presents An Ambitious 5-Year Plan For Arctic Investment - Arctictoday", Arctictoday, 2018, https://www.arctictoday.com/russia-presents-ambitious-5-year-plan-arctic-investment/#:~:text=Russia%20plans%20to%20invest%20some,next%20five%2Dyear%2Dplan.&text=The%205.5%20trillion%20sum%20only,period%20until%202024%2C%20Kobykin%20said.

million dollars, compared to 5-10 billion dollars for a conventional nuclear power plant. The Russian nuclear industry hope is to lead the way in exporting “tailor-made” power stations to suit every need, at low prices and with “home delivery”. With this ambitious project Russia established itself in the region affirming its willingness of being a power in the Arctic and its intention to exploit and obtain revenue from the region’s resources. However, there are several concerns of the plant; indeed, it has also been called the “Ice Chernobyl”, underlining the enormous risk of a plant of this size in the middle of the most fragile region of the world. Finally, raw materials are vital to many industries, including defense. Most Western countries depend on China for these raw materials, giving Beijing significant strategic leverage. Having access to Arctic raw materials would provide economic and strategic advantages that Russia intends to exploit. Its intention is to move the global request from China to the Arctic Russian side, placing itself as a new potential economic partner for several countries.[55]

The future economic aim of Russia is to keep developing with success the Russian Arctic as a future basis for strategic resources. Rosneft, a Russian oil company, claims to have a colossal project to extract the oil contained in the northern Urals. There are several deposits of black gold in the region and none of them have been appropriately exploited, nor have the barrel capacities been ascertained. Rosneft has made some estimates and believes that by developing and connecting the fields, at least 25 million tons of oil per year could be extracted and exported for more than a decade. If realized, this would be the largest oil project in the history of humankind. It would have a huge positive impact on the economy, infrastructure development in the region and Moscow's power status. According to Rosneft, the construction sites would employ at least 100,000 people and involve the construction of 15 new cities, 2 airports, a port, 800 kilometers of oil pipelines and 3,500 kilometers of power cables, with an annual impact on GDP of 2%. These ambitious economic and energy plans will consequently increase the amount of shipping of resources and energy through the Northern Sea Route (NSR). The NSR is the connection between the Barents Sea to the Bering Strait, connecting Europe to the Asian markets; the ice melting is making it more easily navigable, and attractive to the interests of different countries. Moscow considers the NSR a future key sea route in world trade, a potential alternative to the Suez Canal route since it considerably reduces transit times, and therefore costs, from Europe to East Asia. The data shows a significant increase of goods shipping over the route through the years: 10,7 tons per years in 2017, 20 tons in 2018 and 31.5 in 2019. The estimates predict a total of 90 million tons per year by 2035. This is considered a key element for a single Arctic transport national

[55] Giancarlo Sturloni, "Ecco La “Chernobyl Dei Ghiacci”, La Prima Centrale Nucleare Galleggiante - Wired", *Wired*, 2019, https://www.wired.it/scienza/energia/2019/08/24/akademik-lomonosov-centrale-nucleare-galleggiante/.

system and for the region's whole development and the far Russian East. The development of the Northern Sea Route will be accompanied by the provision of infrastructures and services necessary to ensure safe navigation throughout the region; ports, hub and international airports are just some of the main groundwork that need to be improved in order to make the route fully accessible and safe for the next years.[56] The future prospective and scenario of the routes will be analyzed in-depth in the last chapter.

2.1.2 Russian Arctic militarization

The Fundamental Principles of the State Policy of the Russian Federation in the Arctic until 2035 reflects the hopes and the perceived threats associated with the actual warming of the Arctic; it aims to advance the development of the region's abundant resources and improve the living conditions of the Russian population. From this perspective, the military presence of NATO in the Arctic region, due to US and Norwegian roles in the area, concerns Russia. In 2014, sanctions toward Russia were established right after the Crimean occupation and, in the same year, the Arctic Security Forces Roundtable, one of the main security-based Arctic forums, expelled Russia.[57] Therefore the problematic Russian-American relations influenced the threat perception with a consequent need to military protect Russian territories and interests. The Russian military presence in the Arctic increased with the reactivation and modernization of the post-Cold War period abandoned old military bases. The overall project to modernize the bases, located along the 24,000 kilometers of coastline overlooking the Arctic, includes the implementation of roads, airports, facilities, military headquarters, barracks, naval and air force sectors. The Russian Arctic Anti-Acess/Area Denial (A2/A2)[58] capacity has been mainly increased through the capacitive reinforcement of the Northern Fleet; it makes up two third of the whole Russian Navy and dispose of the most advanced Russian resources. As a consequence, the Russian naval strategy was updated underling and stressing the importance and the primary role of the fleet. The fleet, which is the hub of all military activities in the region, is based in Severomorsk in the Kola peninsula in the west Arctic, whence it controls and patrols the northern coast of Russia. The Northern Fleet accounts for 38 surface units and 41 submarines; among them, the strategic components are characterized by 8 ballistic missiles submarines, 6 Delta IV battles, 3 Oscar II battles with anti-ship missiles, and a nuclear-powered multi-

[56] Paola Fratantoni, "La Strategia Russa Nell'Artico", *European Affairs Magazine*, 2020, https://www.europeanaffairs.it/blog/2020/03/29/la-strategia-russa-nellartico/.
[57] Abhishek Saxena, "The Return Of Great Power Competition To The Arctic | The Arctic Institute", *The Arctic Institute*, 2020, https://www.thearcticinstitute.org/return-great-power-competition arctic/#:~:text=Russians%20have%20militarized%20the%20Arctic%20at
[58] The attempt to deny an adversary's freedom of movement on the battlefield

role submarine. On the other hand, the surface fleet disposes of the missile-launching cruiser Kuznetsov as its flagship recently comes from an extensive modernization program. The other central unit at the disposal of the Northern Fleet is the Kirov-class nuclear-powered missile cruiser Pyotr Velikiy, which is armed with long-range surface-to-air missiles. The territorial component instead, is composed of two permanent arctic brigades, specialized in conducting a military operation in extreme weather condition, such as the Polar Arctic Circle ones: the 80ª motorized brigade stationed on the Kola peninsula near the Finnish border and the 200ª motorized brigade stationed near Murmansk, only 11 km from the Norwegian border. Finally, essential means to mention are the several Russian diesel/electric and nuclear-powered icebreakers; the Arktika, the new entry, arrived in 2020. It is the world's most potent nuclear-powered icebreaker currently in service. With 173.3 meters long, 34 meters wide and with a displacement of 33540 tons the Arktika can break up ice sheets three meters thick.

The fleet protects the military apparatus in the Kola peninsula, allowing Russia to conduct strategic operation and protect the nuclear forces freely. Moreover, the fleet ensures Russian access to the Arctic Ocean, North Atlantic Sea and, Giuk-n gap [59] while monitoring the Northern Sea Route. The air force is equally important for the Russian patrol of the region; in the last years, Russia modernized several Soviet-era airbases and constructed new bases along the Northern Sea Route. Examples include Nagurskoye airbase on Alexandra Land and Temp airbase on Kotelny Island. Air defense forces and anti-aircraft defense systems are prioritized among new military infrastructure in the Russian Arctic, both onshore and in the Arctic Zone of the Russian Federation (AZRF). This includes investments in multi-layered air and coastal defense systems, electronic warfare capabilities, and radar systems.[60] The new Russian strategy is also characterized by the impressive Russian military Arctic exercises' operational tempo, test, and scale of nuclear weapons; the main emerging features are strategic mobility and short warning time. These exercises' aim is to show how Russia can exercise its power within and outside the Arctic region and its military build-up. The most recent and explicative example occurred in March 2021: three Russian nuclear-propulsion submarines surfaced in the Arctic ice for the first time. The aim to demonstrate the Russian military increasing capabilities in the Arctic region perfectly succeeded.

However, the increasing military presence of Russia in the Arctic does not necessarily imply war offensives; it is important to bear in mind how the 2020 Policy in the Arctic until 2035 discusses

[59] GIUK is an acronym for Greenland, Iceland, United Kingdom and it consists in the open ocean between these three land masses. During the 1940s this term was used to refer to an area of the North Atlantic Ocean that forms a barrier point for naval warfare.

[60] Matthew Melino and Heather A. Conley, "The Ice Curtain: Russia'S Arctic Military Presence", *Csis.Org*, 2021, https://www.csis.org/features/ice-curtain-russias-arctic-military-presence.

possibilities for international cooperation, even though it devotes more space to threat scenarios for the country. First of all, the Russian military build-up needs to be observed in relative terms; the units, the naval facilities and the troops displaced seem massive, but the truth is that they are massive compared to other states' minimal military presence in the region such as the United States one. Secondly, Russia does not own a dominant position in the Arctic; even though 50% of Arctic territories belongs to Moscow, in order to get out of the Arctic Sea, it has to pass either through the 3 choke points controlled by USA and by the other Arctic states, Bering, Giuk-n Gap and Nares Strait, or through the Canadian internal waters, crossed by US submarines. Therefore, even though Russia would conquer the Arctic in the long run, it would not know how to use it and dominate over the other states; the Arctic is not an escape route from the Russian sense of encirclement; it is an integral part of it. Another important issue to consider is the enormous disposal of energy resources that Russia holds in its Exclusive Economic Zone and over the land; thus, Russia does not need to harshly compete with other countries for grabbing rights over the sea bed resources; its aim is just to exploit as much as possible its available resources in order to become a leader in the export sector and increase the national economy. Additionally, the central area of the Arctic Ocean, the area outside the national EEZ, where the claims of Russia, Canada, and Denmark to the Lomonosov submarine ridge overlap, is utterly unknown in mining terms. Finally, as mentioned before, the Russian attitude is defensive in the Arctic. The unextracted resources account for 40% of Russian gas, and 14% of Russian oil, one-fifth of Russia GDP is produced in the region, and the actual navigable arctic route is the Northern Sea Routes in the Russia internal water (contested by the USA); it seems clear how the Russian necessity is to protect, defend and extend its sovereignty over the extensive assets in this empty polar immensity. Economic and national security are the priorities. It is fundamental to occupy and consolidate strategic positions before the arrival of other states in the region. In the light of these reasons, Russia's valued militarization of the Arctic is an extension to the north of the ongoing garrison on its other borders. Moscow is protecting its wealth and symbols of power, not preparing territorial or maritime conquests. It is frightened, not enticed, by the opening of a new front due to the melting of the ice and its connection to Northern Europe and the Far East. Probably, it will not replicate in the polar latitudes the same assertiveness shown in Eastern Europe. From an indispensable treasure trove of resources to a world heritage site and a cradle of spiritual rebirth, the polar region remains for the Kremlin, an area of economic, strategic, and image interest to be defended and not dominated.

2.2 China: a near - Arctic state

In 1925, Chinese activities in the Arctic begun with the signing of the Svalbard Treaty that allowed the People's Republic of China (PRC) to conduct maritime, industrial, commercial and exploitative activities in the Svalbard archipelago in Norway. Since then, China's involvement in the exploration of the Arctic grew significantly, thanks to a boost in international cooperation among the local actors. In 1996, China became a member of the International Arctic Science Committee, and three years later, it started to organize several expeditions in the Arctic. An important turning point occurred in 2004 when China built its research Station called Arctic Yellow River Station in Ny-Ålesund, in the Svalbard Archipelago; in 2016, it built the China Remote Sensing Satellite North Polar Ground Station in Sweden, and in 2018, China unveiled the China-Iceland Arctic Science Observatory. It is clear how the involvement and the interests of China matured significantly over time. In 2013, China obtained the role of an observer in the Arctic Council: its presence in the Council allows China to use both the multilateral and bilateral contexts to conduct significant diplomatic and commercial activities in the region. China has no voting power in the Council, but it can participate in meetings and discussions about the most essential Arctic's issues. It is exactly for this reason that PRC included the "Polar Research Institute of China – PRIC" among the Council's working groups; this allows China, and thus other states involved in Arctic policy, to provide assessments that can influence decision making and support their interests in scientific research.

Right after the obtaining of the observer status, the Foreign Ministry Spokesperson Hong Lei' declared that: "China supports the [Arctic] Council's principles and purposes, recognizes Arctic countries' sovereignty, sovereign rights and jurisdiction in the Arctic region as well as their leading role in the Council and respects the values, interests, culture, and tradition of the indigenous people and other people living in the Arctic region".[61] Despite this declaration, China wanted to have a major say in Arctic governance, and through the years, it started implementing its strategy.

In 2018 Beijing issued the White Paper of China's Arctic Strategy; in the document, China presents itself as a "near-Arctic State" and one of the most important stakeholders in the region. Before going through the document's analysis is worth mentioning the origin of the Chinese Arctic Policy that led to the White Paper issuing. Through the years, China unveiled a substantial interest toward the North, and the publication and release of the White Paper are just the officialization of a long history of involvement and attraction toward the Arctic. Three internal elements shaped the Chinese Arctic Strategy. First of all, the strategy has been guided by the "Chinese dream" and by the Belt and Road

[61] "Foreign Ministry Spokesperson Hong Lei's Remarks On China Being Accepted As An Observer Of The Arctic Council", *Lr.China-Embassy.Org*, 2021, http://lr.china-embassy.org/eng/fyrth/t1040943.htm.

Initiative; according to Beijing, China has to take advantage of the present strategic opportunities, carry out economic development and represent a major responsible country. In 2017, China presented the Belt and Road Initiative, the great project of Chinese economic development in the Western world; it called for international cooperation for resources extraction, shipping and infrastructure developments. The Arctic is therefore a continuum of this initiative and an extremely strategic region for the development of the Polar Silk Road, an innovative investment for Chinese economic security that can implement the connection between China, Asia and Europe. The Arctic Strategy implemented the Chinese dream introducing a new role for China as a responsible power, which aims to be an active actor in the development and study of the region. The second internal element is the traditional involvement of experts and scholars in the conceptual evolution of the Arctic: through the years, the Chinese government appointed scholars and researchers to elaborate and program the Chinese role in the Arctic. Several different documents and studies have been issued contributing to the 2018 strategy release. The studies analyzed several different aspects, starting from which role China could have in the region to include non-Arctic states such as Mongolia and Kazakhstan. Although the scholars' statements not always reflecting Beijing's perspective, they actively contributed to shape the main *leitmotif*; indeed, the idea of China as a near-Arctic state has been first introduced and discussed among scholars for five years before the strategy publication. The last element that influenced this strategy is the crucial Chinese regional involvement in the area in order to implement national interests; cities and provinces are cooperating along with northern actors in a perspective of a future Chinese significant role in the region. For instance, the Heilongjiang province began cooperating with Murmansk in Russia. At the same time, Shanghai is working on shipping developments in a prospect of cooperation with Arctic countries' seaports.

The 2018 White Paper of China's Arctic Strategy is the first document that clearly outlines China's view over the Arctic issues, international cooperation, and resources' development. The document explains how the Arctic events strongly influence and impact China's economy, agriculture, industries, and many other sectors. Therefore, a Chinese participation seems essential since different security implications are at stake.

China affirms that the Arctic issues have a global impact and, in this framework, it presents itself as "responsible power". With this role, China underlines its obligation and moral right to be part of the regional development and create a "share future for mankind in the Arctic".[62] The paper clarifies how China knows the limitation of its right in the region. Consequently, it respects the in-forced rules; at the same time, the document defends the Chinese rights through the respect of International Law (e.g. the rights deriving from the Svalbard Treaty). The Chinese strategy does not breach the Arctic states'

[62] The State Council Information Office of the People's Republic of China, *China'S Arctic Policy* (Beijing, 2018).

rights but it stresses the importance of equal participation in the area, of both Arctic and non-Arctic states. Consequently, it appears clear how the Chinese approach toward the region has different shadows. The first is a clear global and inclusive idea of the region with the aim of Chinese participation in the Arctic governance in order to "participate in regulating and managing the affairs and activities relating to the Arctic based on rules and mechanisms and jointly build a shared future for human kind";[63] in this respect, the Arctic Council is seen as the right place to solve problems and promote sustainable development. Likewise, this is underlined by the Chinese involvement in different international organizations such as the "Arctic territory of dialogue forum". The second is more individual and self-referred: the Artic Silk Road project is hugely ambitious. Apart from the necessary and indispensable development of common strategies with the Arctic actors, China wants to promote its companies and research centers to enhance economic development and the economic security of the country. The strategy presented conciliate the aim of creating a future for humanity in the Arctic and the Beijing idea of being a major responsible country. China is longing to become a future "polar power" in the long run, able to cooperate at an equal level with other Arctic states and able to assert itself individually.

Three are the elements that China owns and uses in order to legitimized and promote this purpose. The first one is the geographical proximity; the People's Republic defines itself as one of the closer continental states to the North Pole. The idea of proximity was developed with other non-Arctic states that were much further away than China but that were candidates for the role of permanent observer to the Arctic Council, such as Japan. Indeed, China is at least 1,600 kilometers away from the region. Moreover, China uses specific maps made by the researcher Hao Xiaoguang, publicly released only in 2013 despite their use since the beginning of the century. The maps show how China is the Eurasia's basis instead of its edge; moreover, the Arctic area is represented as ice-free, and therefore, freely passable. These used maps alter the perception of China, making it appear as a maritime and terrestrial power. This is a typical and recurrent issue in Arctic geopolitics. The peculiarity of its cartography is the temporal dimension: the maps delineate future scenario to shape perceptions and strategies.[64] The second element that Beijing uses in order to legitimize its presence and interests in the region is international law; according to the published White Paper, the states outside the region "*are entitled to conduct scientific research, navigate, fish, flyover and to install submarine cables and pipes offshore, in the Area and in other relevant maritime area of the Arctic Ocean*".[65] In addition, the paper cites right of exploration and exploitation over Area's resources; these

[63] Ibidem
[64] Giorgio Cuscito, "L'artico È Vicino Ma Non Sarà Della Cina", *LIMES*, 2019.
[65] The State Council Information Office of the People's Republic of China, *China'S Arctic Policy* (Beijing, 2018).

assumptions are based in 1982 UNCLOS Convention. The last element is based on how the Arctic nature goes behind a regional approach; according to China, this region has a crucial role over the interests of all those states that do not belong to the region. Therefore, China knows that cannot remain outside this strategic theatre and it asks for a full access. To give a clear example, China signed an agreement with several states, including the European Union, in order to ban illegal fishing in the Central Arctic Ocean for the next 14 years.

2.2.1 Driving Factors

Several different interests in the region drive China and the aim of becoming an Arctic Power implies a 360° involvement. One of the most important driving factors of Chinese interests in the region comes from climate change events and potential security consequences. "The Arctic is the fasting warming region on earth, and China is the biggest gas emitter." [66] China is fully aware of being one of the most vulnerable countries to the negative impacts of climate change: extreme weather and natural disasters already had and will keep having an impact on economic losses, living conditions, and food chain in China. Thereupon China is eager to learn and study as much as possible about the linkages between the Arctic changing environment, natural and climatic events, and China. The worst future scenario foresees that by 2070 an increase in the sea level may force 20milion of Chinese to move from the coast to the inland.[67] In addition, the study of environmental events in the Arctic is significant for a country in which glaciers are present: the Himalayan glaciers melting will impact different Asian populations, including Chinese one; like ice melting in the Arctic, glacier melting in the Himalayas will also raise sea levels significantly; this is why the Himalaya is defined as the third pole. In April 2013 Iceland President Ólafur Ragnar Grímsson pointed out that: "the Arctic, the Himalayas, and Antarctica are not isolated and separate parts of the globe and, on the contrary, their fate, the fate of the people and their future are closely connected".[68] If China keeps its "business as usual" approach it will reach an increase of temperature of 2.7° by 2050; thus, China's interests in climatic changes in the Arctic are expected to be a way to learn and mitigate the effects in its territories. Because of all these factors and possible future scenario, China is investing in scientific research in the region, especially in Greenland; China plans to invest around €15 billion in the island over five years, opening zinc and iron ore mines, building three airports and most important a large scientific base. The Chinese researchers conduct scientific studies in compliance with the in-force

[66] Sanna Kopra, "China's Arctic Interests", *The Arctic Yearbook* 2 (2013): 2.
[67] ECD, *Ranking Of The World's Cities Most Expose To Coastal Flooding Today And In The Future*, OECD Environment Working Paper No. 1 (Newark, CA: OECD, 2007).
[68] Sanna Kopra, "China's Arctic Interests", *The Arctic Yearbook* 2 (2013): 5.

legislation in order to explore the territory and its abundance of resources. The White Paper mentions a different kind of resources of China's interest going from gas and oil to living resources; the aim behind it is to pursue a complete understanding and expertise of the Arctic science in order to create favorable conditions for humanity and ensure the protection and development not only of Arctic, but of China as well.

A further purpose outlined in the White Paper is the Chinese participation in the conservation and utilization of fish stock and other maritime living resources. The fisheries have shown a tendency to move toward the North of the globe because of climate change, nurturing the prospective of a new fishing center in the Arctic. In connection with a scientific aim and purposes, China presents itself as an actor willing to study fishing development in the high seas in the Arctic Ocean. This is why China strongly supports a legally binding international agreement and an ad hoc organization on the management of fisheries in the high seas of the Arctic Ocean. China declares itself committed to protect the biodiversity and the ecosystem in the Arctic region through lawful and transparent mechanisms in accordance and compliance with the Arctic States.

In this regard, several scholars started to talk about science diplomacy in the Arctic. As the Arctic suffers from the growing environmental instability, the scientific cooperation and knowledge sharing can be a fundamental tool in the discoveries field; China well understood this and, as mentioned before, it highlighted in the White Paper the respect of Arctic states sovereignty and rules. The Arctic Chinese scientific diplomacy is based on four main elements: sharing scientific resources, long-term interactions among scientists, reinforcing knowledge base institutions and spilling over effects. All these factors shape a positive vision of Chinese role in the Arctic; indeed, several actors such as think tanks and government agencies defined the Chinese presence as a professional partner that does not confront scientific rules and norms. Despite these positive assessments, some scholars delineate some problems: the perception is that the scientific intervention of China has to remain purely scientific without trespassing into politics; the term "science diplomacy" is therefore considered biased in this term. The major fear is losing professional principles, standards, scientific results, and evidences in the name of a major political game driven by Beijing.

All these analyzed goals lay the ground for a more significant economic pursuit: the aim for China is to reach exponential economic growth of the country. Chinese industries and the manufacturing sectors are constantly increasing the demand of energy and natural resources; the Arctic is where oil and natural gas are extraordinarily abundant and China is looking at the region as a place where replenishing them keeping the economic growth steady. The main objective for Beijing is to have natural gas making up 15% of Chinese energy basket for the next ten years. In the People's Republic of China, investing in clean energy is essential in order to reduce the extremely high pollution rates.

It is clear how the aim is in line with the Russian case, where the potential of undiscovered resources is a factor of interest for states in need of energy production. In 2014, following the US-EU sanctions against Russia, Moscow and Beijing signed an agreement to ensure China Russian gas supplies starting in 2018 for 30 years and the construction of thousands of kilometers of gas pipelines and infrastructure across Siberia; this would have ensured the country an energy diversification from Qatar, Indonesia, Australia, and the United States. According to estimates by the International Energy Agency, natural gas will be one of the sources replacing coal shortly. By 2040, an increase of 45% is expected due to the demands of Asian countries. China might likely cover a quarter of the expected increase of the global demand and its imports reach 280 billion cubic meters by 2040 (second only to those of the European Union); this could induce China in the medium to long term to invest more in Russia (Siberia) and in the Arctic, in order to ensure a constant and diversified energy supply. Chinese investments in the Russian Arctic are geared towards gas extraction and are planned to be provided through the Silk Road Fund system.

In order to fully understand all the Chinese Arctic economic aims, it is necessary to understand the new economic path that China is undertaking; the economic model of reference has been defined by President Xi Jinping the "New Normal". This model is based on a "domestic-driven economic model and a mid-to-high-speed growth with higher efficiency and lower cost".[69] The Belt and Road initiative (BRI), placed inside this framework, reflects the needs of the new economic model, which aims to increase confidence toward China as a responsible player in the global geopolitical context. Consequently, in the White Paper, a cooperative view of the Polar Silk Road is introduced as an opportunity for sustainable infrastructural, technological, commercial and economic development. Linked to the concept of the common human destiny in the Arctic and the concept of equal status among the actors, it is proposed as a platform for cooperation between the Arctic states and non-Arctic states. For this project, China mainly focuses on the Russian and North European countries' cooperation to build a comprehensive infrastructure network in the Arctic region, including coastal infrastructures and port facilities, as well as economic development projects, contributing to its economic flows. China wants to benefit from the Northern Sea route in order to create a third alternative link between China and Europe in the BRI framework. The Belt and Road Initiative's map is developed along the land route that crosses Eurasia passing through the central Asia and Middle East; moreover, a maritime route overcomes the Malacca strait, goes through the Indian Ocean and the Suez Canal. Therefore, the Polar Silk Road proposes an alternative that will allow a strong reduction of costs and time for Chinese shipping. China plans to exploit this "opportunity" through

[69] Michael M. Du, "China'S "One Belt, One Road" Initiative: Context, Focus, Institutions, And Implications", *The Chinese Journal Of Global Governance* 2, no. 1 (2016): 30-43, doi:10.1163/23525207-12340014.

the three main routes that are expected to be free of ice by summer 2030: Northern Sea Route, North West Passage and Transpolar Sea Route; therefore, the export and transport of energy resources will be facilitated thanks to them. Three main advantages are emerging from the Polar Silk Road project: the first one is a reduction of travelled nautical miles to reach Europe from China; the estimates declare a reduction between 1.370 and 4.600 NM with a saving of 127 billion dollars for the People's Republic. The second advantage would be an economic growth for northeast provinces such as Shandong and Liaoning. Finally, the new commercial flow will reduce the number of passages through the Malacca strait under the US Navy control. The project of the Polar Silk Road with its scenario and consequences will be analyzed in depth in the last chapter.

In order to reach the economic purposes in the Arctic, Beijing is equipping itself with different ships and instruments: China has commissioned several icebreakers, including a 152-metre atomic icebreaker which is expected to cost 140 million euros; it will be the largest in the world of its kind, and it will be able to break through a layer of ice one and a half meters thick. Commercial purposes obviously drive this new Chinese necessity: this icebreaker will allow China to access more easily the Arctic resources and navigate the ice-covered sea in order to conduct scientific researches. Nevertheless, behind this "civilian" research and development project a purely military move could hide: paving the way for research into nuclear propulsion to be carried on the new aircraft carriers of the Plan Navy, the Chinese navy. Moreover, China has also begun testing the 'Snow Eagle', an aircraft designed for polar flights, and is studying what a submarine emerging from the ice can do.

Finally, China targets and aspires to have a role in Arctic tourism since it is an evident emerging sector; consequently, Beijing upholds companies and enterprises in developing partnership with the Arctic states to develop this profitable sector. In the same way, China is developing security, rescue, and insurance systems to provide high-level assistance for Chinese tourists in the region. In a green optic, China is also rising environmental awareness in the Arctic and it aims to develop responsible, low-carbon, and sustainable tourism in the area.

2.2.2 Win - Win strategy

Thanks to the 2018 White Paper, China has officially declared which role it will play in the "North race" in the following years. This role can be expressed through the terminology "win-win strategy", which includes the boosting of bilateral relations with Arctic states and strengthening Chinese responsibility in Arctic matters. The win-win outcome can occur if there is equity, meaning that all parties are of equal status; therefore, China seeks to "pursue an economic development strategy for the region that requires the Arctic to be open to Chinese development and that China is given equal

standing to other Arctic nations".[70] China presents itself as an actor defined "near-Arctic state" respecting the international norms and agreements while underling the rights of non-Arctic countries in the region. From this binomial, a multi-layered Arctic cooperation for a win-win result is presented. With the announcement of the Beijing government that the Arctic is now an official goal for its Belt and Road Initiative, economic investments, diplomatic activities, and relations across Northern Europe, North America, and Russia are all the required pieces to build a coherent strategy. The launching of joint research projects, the care of bilateral relations with individual polar countries and the financing of essential infrastructures for developing the Arctic zones are the base of the win-win strategy. It gradually ensures the PRC a progressive improvement in Arctic diplomacy; moreover, it creates a space for maneuver that contributes to make the PRC an increasingly important partner, if not essential, for many states in the infrastructural and economic development. However, this is a very delicate area of maneuver, which puts Beijing in a privileged position in respect to partners that need financial support. However, it could lead to Chinese political interference in the domestic political affairs of partner countries, something Beijing has always been cautious not to allow. Here the Arctic Chinese relations, the financing plans and the contribution for the development of the region are presented.

Russia

Since 2014, after the Crimean occupation and the several sanctions imposed by the US and EU, the Kremlin started to boost the cooperation with China in the Arctic region in energy, military, and infrastructural terms. During the Yamal LNG project and Sabetta port's constructions, western sanctions prevented Russia from borrowing funding from the European Union and American banks for more than 30 days, posing an important constraint. Therefore, Russia moved toward China's investments. Two Chinese banks, the Export-Import Bank of China and the China Development Bank Corporation signed two 15-year credit lines for $10.7 and $1.5 billion, respectively. China's Silk Road Fund also provided $1.2 billion. In exchange, the China National Petroleum Corporation (CNPC) owns 20 percent equity in the project while the Silk Road Fund owns 9.9 percent, giving Chinese companies 29.9 percent ownership over the LNG plant.[71] In July 2019, the Russian producer Novatek shipped for the first time the LNG through the Northern Sea Route to China. A further element of cooperation among the two powers has been demonstrated by the agreement reached between the China Poly Group Corporation and the local government of Arkhangelsk to build a deep-water new port, in the Northern Dvina River. It will permit access for big-tonnage ships; the project

[70] Heather A. Conley, *China's Arctic Dream* (Washington: Center for Strategic & International Studies, 2018).
[71] Ibidem

aims also to connect the port to the Belkomur railway junction and in turn, to the Trans-Siberian Railway. This plan will increase shipping and trade volume to and from China; therefore, Chinese firms have confirmed their interest in financially supporting the project.[72] The project is supposed to start in 2023 and Russia should contribute with 1.6 billion dollars on 5 billion. In addition, China is cooperating and will try to boost the cooperation with Russia in order to develop valuable infrastructures and technologies to overcome the logistic difficulties of the Polar Silk Road project; the Northern Sea Route under the Russian domain is one of the most promising viable passage for its realization. However, it is important to underline how China and Russia are not allied. However, commercial partners with a strong interest in Eurasia, and we do not have to exclude a possible future clash among the powers in the Arctic region with a robust Russian opposition toward the Chinese Arctic penetration.

Greenland

In Greenland, Chinese investments represent 11.6% of the national GDP. The island is rich of mineral resources, especially rare earths that result extremely attractive for Beijing's mineral and energy sector. Rare earth elements comprise 17 different minerals, including uranium, praseodymium and neodymium essential in the automotive industry, for electric batteries, mobile phones and wind turbines production, Chinese centerpieces. The Chinese company Shenghe Resources and Greenland Minerals and Energy signed a memorandum of understanding to conduct extraction activities in Kvanefjeld, the sixth-largest world uranium deposit and the second in terms of rare earth oxides. In the same way, the Danish company Ironbark and the Chinese company Nonferrous Metal take these resources from the Greenland fjord of Citronen. Again, the General Nice Resources company from Hong Kong owns the rights for iron extraction in the land. In 2017 Huawei announced jointly with TeleGreenland company, would have installed the undersea 100G net to link the most remote territories and improve the communications lines among Greenland, Canada and, Iceland. For Greenland, the Chinese investments are a way not to financially depend on Denmark, even though Copenhagen is constantly monitoring the Chinese activities in the country and the national security implications that lie under Danish control. Denmark wants neither the island to become a territory of competition between China and the US nor encourage an island attempt at independence. For this

[72] Atle Staalesen, "Chinese Company COSCO Confirms Interest In Trans-Arctic Shipping To Arkhangelsk", *The Independent Barents Observer*, 2017, https://thebarentsobserver.com/en/arctic/2017/09/chinese-company-cosco-confirms-interest-trans-arctic-shipping-arkhangelsk#:~:text=Photo%3A%20dvinanews.ru,Chinese%20company%20COSCO%20confirms%20interest%20in%20trans%2DArctic%20shipping%20to,tonnage%20ships%2C%20the%20company%20says.

reason, in 2018, Denmark financed the construction of two airports on the island in order to avoid the Chinese companies control and management. Greenland has further importance for China; indeed, it is supposed to be the arrival point of the Polar Silk Route: the route should pass through the Transpolar Route, the actual solely route that is not included in any states territorial waters and that is currently in need of international investments in order to build and develop new infrastructures.

Iceland

This small but strategically located area is also evidence of the Chinese presence in the Arctic. China is particularly interested in fishing, geothermal energy and tourism; between 2007 and 2017 the Chinese tourists arrived at Keflavik airport moved from 9 thousand 5 hundred to 86 thousand. Since the economic collapse of the island in 2008, China started to inject significant investments in the country with a future view of using the country as a logistic hub in the region. Among the Chinese investments, it is possible to mention the purchase of the Norwegian company Elkem in Grundartangi- Iceland; this company owns a plant for ferrosilicon production, one of the most used and important materials for solar panels production, whose China is the first producer in the world. Moreover, in October 2018, the Chinese institute for polar research and the Icelandic research center built a combined structure to study the Northern Lights and magnetic field variations.

Canada

The main interest toward Canada arises from the abundance of oil and gas resources in the country. The China National Offshore Oil Corporation owns Nexen, the most extensive Canadian oil company in the country; moreover, in October 2018 Canada installed four maritime monitoring devices developed by the Chinese Sanya Institute of marine science and engineering. However, the main driving factors is the Northwest passage, an extremely important route for the Chinese plan of the Polar Silk Route; the route offers important resources and exploitation opportunities, but first of all, it is a fast hub delivery of resources to the Asian markets and a way to test the ice-breaking new technologies of China. The distinctiveness of Canada’s Arctic strategy lies in its approach that minimizes the relevance of preparing for conventional military conflict; rather, it focuses on the importance that the military itself plays in supporting civil society in dealing with unconventional threats from increased maritime trade or tourism growth. Thus, the crossing of the Northwest Passage regularly by the Chinese icebreaker Xue Long is not perceived as a direct threat but instead leads to an improvement and efficiency of military intervention in the area. Thus, the strategic nature of Beijing's planned investment lies in the little opposition the proposed investments will receive.

Alaska

China is strongly interested in this region but, the competition between Washington and Beijing poses some problems; moreover, the region hosts essential infrastructures for the US missile systems. In 2017 the Joint Development Agreement for a $43 billion development included three main Chinese energy and finance companies, Bank of China, Sinopec and China Investment Corporation. The main Chinese Investment was directed toward LNG sectors and annexed infrastructures. Due to the tariff war among the two countries, the agreement was off in 2019. However, China is still the most prominent commercial partner for Alaska, with an annual export value of more than $1 billion. Several interests are still at stake, from an LNG sector to an increase in trade relation with a particular look at fish export.

Norway

On the Svalbard islands, China has built its research station named Yellow River, a crucial point for Chinese scientists and researchers. At the same time, China is looking at Norway for its strategic position along the Northern sea route; indeed, Kirkenes is a place of strategic interest. For Kirkenes, whose economic fortunes have long been connected to an iron ore mine on the peninsula's western edge, Chinese interests in the region and its assets represent a crucial opportunity. Kirkenes has a unique position, and it will be the first ice-free port on the European side of the North Sea Route; this makes the city an ideal location for an Arctic shipping hub.[73]

Finland

The Chinese interest has arrived in Finland as well. One of the biggest financing, worth being mentioned, is the 2016 Sunshine Kaidi New Energy Group's $1.13 billion investment in wood-based biodiesel plants; this investment clarifies how China is trying to diversify as much as possible its energy portfolio in order to become a leader in the sector. Moreover, exports from China to Finland are growing up 12 percent year on year, mainly in textiles and electronics. China is also intensifying the diplomatic relations with the country: in 2017, Beijing signed with Helsinki a joint declaration setting and promoting future cooperation in the Arctic geology, marine industry, marine and polar research, and technology for environmental protection. It is not a case that this agreement has been signed roughly a month before Finland's chairmanship in the Arctic Council. Thanks to the increase in bilateral relations, China is boosting its connection to the Arctic economy. In November 2018,

[73] Isabella Borshoff, "Norway'S 'Northernmost Chinatown' Eyes Arctic Opportunity", *POLITICO*, 2019, https://www.politico.eu/article/norway-kirkenes-china-influence-arctic-shipping-opportunity/.

Finland has also been the first Arctic country to join China's Belt and Road Initiative through a direct cargo train connecting the Finnish city of Kouvola to Xi'an in China.

China presents itself as a polyhedral actor in the region. On the one hand, it wants to mark its commercial presence in the world and Asia through the participation in different arctic sectors, going from tourism to the exploitation of the subsoil, with a set of different and innovative tools; on the other hand, it wants to keep close all the Arctic states providing attracting and convenient investments in order to let them allow China to be a real Arctic partner; moreover, China aims to promote scientific cooperation and research to keep having continuous and peaceful access to area demonstrating itself as a responsible actor.

2.3 Canadian Arctic and non-conventional threats

Canadian Arctic makes up 25% of the region, with roughly 150.00 inhabitants constituting less than 1% of the Canadian population, of which more than a half are indigenous people. Canada occupied the first chairmanship in the Arctic Council in 1996 until 1998 and again from 2013 to 2015. The Canadian priorities have changed from the first chairmanship to the second one. In the first period, in 1996, the indigenous people were at the center of the focus: Canada was asking for implementation of the cooperation between indigenous and Artic states in order to include them and face common challenges and opportunities; in addition, it enhanced the role of youth in the Arctic with the relative social and economic issues. Instead, the second chairmanship was characterized by prioritizing the mental well-being of the Arctic population and environmental protection, including the reduction of black carbon and methane. Indeed, since the second decade of the century, individuals' awareness of climate change increased and its clear impact made the Canadian government review the countries' priorities. Over time, Canada has welcomed the prominent status of the Arctic and the resulting increase in Arctic activities. Consequently, Canada has been starting to update and modernize its foreign policy in the region. At the same time, Ottawa is aware that the growing attention toward a sensitive area such as the Arctic may create new threats in the far North, and for this reason, it is increasing its presence in the region also not to lose ground to other actors. The last decade has seen an increase in the number of military exercises carried out by the Canadian Armed Forces and in the number of bases in the region. In addition, new patrol vessels have been brought into operation and surveillance tools tested to increase the military's ability to monitor the vast Arctic expanses. The most important feature of the Canadian strategy in order to protect its territories is the shift from prioritizing conventional threats to non-conventional ones. The latter does not arise from the activities

of foreign armies but from the interests of trade, shipping, scientific research, and tourism. These areas call for increased efforts to combat criminal activities, carry out search and rescue operations and prevent natural or man-made disasters. Since roughly the second decade of the twenty-first century, the Arctic started be looked at with different purposes, also shifting the potential emerging risks; the conventional and well-known threats of the Cold War Period are no longer considered a hazard for the region. "Although the Canadian Armed Forces contribute to deterrence against strategic threats in both the North American Aerospace Defense Command (NORAD) and NATO, their contribution is limited to providing military capabilities for soft operations in Arctic operational terms conducted by other government departments." [74] In 2017 the prime minister Trudeau introduced the revision of the Canadian Policy Defense; the new doctrine "Strong, Secure, Engaged" emphasizes the importance of the Arctic for the Canadian Armed Forces; moreover it addresses the security threats posed by climate change, increased economic activities, shipping and the emergence of new actors with significant interests in the region. The main aims settled in the policy are implementing military defense in the region and boost cooperation with regional partners. However, it is important to stress how Ottawa considers the geopolitical nature of the Arctic as non-conflictual; there is no necessity for the country to increase the defense and security against Russian or other states' incursions into the Arctic. The Canadian defense remains the priority, but there is not implicit link with a conventional military threat. Canada incentives sustainable cooperation relationships and dialogue with the other Arctic states, not being worried about a possible future Cold War scenario in the region. Military investments are seen as a tool that will enable the Armed Forces to operate in the Arctic and adapt to the changing security environment through collaboration with allies, increased situational awareness and adequate tools to address major threats. In this framework, in 2000, the national Defense Department drafted the "Arctic Capacities Study" where the Canadian armed forces strategies were analyzed, establishing some recommendations to govern the Arctic environment. Starting from this study, the army developed a strategy and operational structure that abandoned the anti-Russian, state-centric approach that had dominated Canadian strategic thinking during the Cold War period. The new doctrine downplays the importance of being prepared for a conventional conflict in northern Canada and readjusts the function of the Armed Forces by emphasizing its role in supporting other agencies and civilian departments in managing unconventional threats.

The main elements of the Canadian approach are delineated in the 2009 Canada's Northern Strategy that affirms the low risk of military conflicts, the cooperative approach with Russia, and the common

[74] Whitney Lackenbauer and Adam Lajeunesse, "The Canadian Armed Forces In The Arctic: Building Appropriate Ca-Pabilities", *Journal Of Military And Strategic Studies* 16, no. 4 (2016): 7-76.

interests with European Arctic States as the main features and elements to base the Canadian behavior on. In the same way, the official documents for the Canadian Armed Forces plan and strategies are based on these assumptions. The concept of Arctic integration identifies, for example, the areas of law enforcement, environmental degradation, and health emergencies as the most likely and pressing security threats that Canada will face in the region soon. The armed forces play a supporting role to civilian departments dealing with oil spills, ship groundings, incidents requiring search and rescue operations, poaching incidents, naval interdictions, and other similar problems.[75]

As previously analyzed, in the Canadian Arctic policy, it is fundamental to analyze the meaning and the significance of sovereignty since, in the North of the planet, for geographical reasons, it is a more complex issue than elsewhere. The Canadian sovereignty deals with security and identity: states defend their sovereignty first and foremost to safeguard their interests and values. Arctic sovereignty is a recurring topic in Canadian political discourse since the number of resources to allocate for the protection and security of the North is a relevant matter that constantly emerges and that depends on Canadian land control. The Canadian sovereignty is broad since it includes archipelagic waters, defense, external threats, partnership with local communities and nation building activities. However, as analyzed before, the main goal for Canada is to keep its sovereignty over the territories rather than increase its defense and conflictual attitude in the framework of growing attention toward the region. The importance of sovereignty for this country has a long history and can be dated back to the colonial period. Canada did not have its government until the middle of the nineteenth centuries when it gradually gained independence. Since the Second World War, the Canadian Arctic has acquired its strategic importance and, since then, its relations to the American neighbor increased, and questions of sovereignty took on particular significance: the protection of the North means the protection of the continent. Therefore, in the Ottawa strategy, the security threats coming from non-conventional threats overlap with long-standing political and legal disagreements over the status of certain portions of territory and sea, which are referred to in the Canadian narrative as disputes over Arctic sovereignty. The main dispute is connected to the archipelagic water of the Arctic: from the Canadian perspective, it is a historically internal maritime space bounded by straight baselines over which Ottawa exercises full sovereignty. The United States, on the other hand, argues that these waters form an international strait and, therefore, disputes Canada's claim to extend its sovereignty beyond the internationally recognized 12 nautical miles limit. The cordial relationship between the two leaders facilitated an operating agreement according to which American icebreakers would seek transit

[75] Government of Canada, *Statement On Canada's Arctic Foreign Policy - Exercising Sovereignty And Promoting Canada'S NORTHERN STRATEGY Abroad* (Ottawa, 2010).

permission before crossing what Ottawa considered internal waters. However, the terms of the agreement were formulated in such a way as to exclude any effective American recognition of the Canadian position. Despite the long-standing cooperation with the United States, the latent dispute over the status of the Northwest Passage has made Canadian governments particularly sensitive to the possibility of uncontrolled activities in the North. For this reason, the cornerstone of Canada's Arctic policy has always been the assertion of its sovereignty in the region, which implies maintaining a robust military presence. Nowadays, the Northern routes are not exclusively crossed by the coastal states' icebreakers and effective control of the region is more than necessary. External actors like China are gaining an important role in the Arctic, in the arctic shipping and in exploiting regional resources. As previously analyzed, Chinese investments are one of the major sources of financing in the Arctic, and the activities are recurrent and increasing. However, these activities are not perceived as a threat for Canada, but they are an incentive for strengthening its security strategy and the presence of its armed forces in the region. Adam Austen, the spokesperson for Global Affairs Canada, affirmed that the foreign ships are welcomed in the Canadian water as long as they respect Canadian rules. The main priorities connected to the Canadian sovereignty are connected to the necessity of resolving boundary issues and securing international recognition for the full extent of the extended continental shelf wherein they can exercise sovereign rights over the seabed and subsoil resources. [76] Regarding the first priority, Canada answers through the use of international law; the disputes present among Canada and other countries, such as the already mentioned US case, are all well-managed and do not prevent a cooperation with the neighbor countries, nor increase security challenges. Regarding the second priority, Canada strictly respects the 1982 UNCLOS convention establishing states' rights for defining and exploiting the continental shelf; indeed, in 2013, Canada sent its submission to the United Nations Commission on the Limits of the Continental Shelf for defining the limits within which it may exercise its rights.

2.3.1 Canadian Northern Policy Framework

In September 2019, the Canadian government released a new Arctic Policy Framework co-developed with Indigenous, territorial and provincial partners in order to replace Canada's Northern Strategy (2009) and Canada's Arctic Foreign Policy Statement (2010). The Arctic and Northern Policy Framework started to be considered a real change for the Canadian government; indeed, Canada's Arctic and northern residents felt a big gap between opportunities, services and standards of life compared to the Canadians. The services sectors are not comparable: energy, transport, and

[76] *Statemente On Canada's Arctic Foreign Policy*, Exercising Sovereignty And Promoting Canada'S NORTHERN STRATEGY Abroad (Government of Canada, 2010).

communications are just some of the utilities there are not well developed in the Arctic. This is why a new awareness was born in Canada. The formal consultations were not considered enough to develop the Arctic region and to respond to the local populations' needs; therefore, the government co-developed a new framework: indigenous peoples, Inuit, First Nations and Métis, six territorial and provincial governments worked to this framework together. The government was aware that the traditional policies "made in Ottawa" were not successful to manage this complex region and answer all the new challenges. The 2019 Framework for the Arctic sets seven main priorities to address and implement in the region through 2030.

The first goal introduced in the policy set objectives to allow indigenous people to be healthy and resilient, reducing the traditional gaps between them and the rest of the Canadian population; among the initiatives to undertake, worth of mention is the eradication of hunger and the provision of learning and skills to development opportunities. The second goal of the policy regards Arctic's infrastructures; there are important gaps in the infrastructures' sector in the Canadian Arctic: only roughly 70 communities are accessible by air or water roads for the whole year; the others remain isolated winter season. Marine and aviation are the only possible way to connected some remote areas of Canada with the rest of the country; therefore, they need an important boost. The undeveloped transportation infrastructures make challenging, time-consuming, and expensive the services' delivery, the movement of passengers and goods within and outside the Arctic region. This has important implications for the trade and commerce of the region. In addition, climate change is a real threat for these infrastructures and, if on the one hand it limits the possibilities of building some new ones, on the other hand, they are a vital priority for the inhabitants. This situation causes high costs and a lack of sustainable and reliable energy resources: "nearly two-thirds of Arctic and northern communities relying exclusively on diesel, which is expensive, difficult to transport and one of the primary sources of greenhouse gases."[77] Consequently, Canada aims to develop corridors to achieve different purposes: connect communities, implement commerce and trade, access and transport the necessary resources. The Framework poses further attention to the development of sustainable and strong economies; to enhance the resilience of the Arctic, it is necessary to develop a strong economy in region. However, the problem remains connected to the high operating costs and to the lack of infrastructures and renewable energy supply. The Framework affirms to support the local economies of fishing, hunting and sealing while promoting innovation and diversification; the objective to reach by 2030 is boosting the access to domestic and foreign markets in furtherance of present and future economic activities. Foreign investments and international trade have to be considered as an

[77] "Canada's Arctic And Northern Policy Framework", *Rcaanc-Cirnac.Gc.Ca*, 2019, https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587.

important engine for the contribution to the growth of the Arctic and its business; this is why the Framework aims to "take advantage of global export opportunities made possible by existing and new free trade agreements and attract and retain foreign direct investment in a way that enhances economic development and environmental protection while ensuring Canada's national security interests".[78] At the same time, climate change is expected to influence some economic sectors such as tourism, shipping and resources extraction; Canada individuates these sectors as potential growing activities, but also as potential threats for its regional precarious stability. The access to the area will increase and the protection of borders and local population becomes essential. If climate change may increase economic growth for the region, on the other side it will increase risks for ecosystems and infrastructures while placing additional stress on search and rescue and disaster response capacity.[79] As all the other Arctic states Canada understood the potential and the contribution that local research could give to the region; this is why a specific part is dedicated to knowledge and research in the Framework. Studying and understanding climate change effects and adaptation is essential for research in this fragile region; simultaneously, the activities of geological mapping to tracking species distribution to understanding the socio-economic and cultural impacts of development are mentioned.[80] The Framework wants to ensure Canada the proper tools and infrastructures to conduct these researches and boost international cooperation to achieve results. Moreover, it aims to support the development of data collection and analysis to produce evidence for the Arctic and Northern populations. Fight against climate change is the fifth goal set in the Framework; the temperature in the Canadian Arctic increased at a rate of 2 to 3 times the global average posing severe threats for Arctic communities, activities and infrastructures. Moreover, the arctic ecosystems, water and land are suffering a significant impact causing habitat to shift and the diffusion of alien species. Canada commits itself to mitigate climate change through sustainable management of natural resources, minimizing pollution, conserving biodiversity, safeguarding and restoring the ecosystems. The Framework also underlines the essential role of Indigenous peoples in the stewardship of northern ecosystems and monitoring the region. At the same time, Canada is fully aware that climate change has to be tackled not only at domestic level, but also at international one: the causes and the driving factors of pollution are mainly external to the region. Although these environmental events have a global impact, there is a disproportionate impact on the Arctic region, Canada in particular. Therefore, Canada wants to play a leading role in the fight against climate change with ambitious international actions and strategies. In this perspective, the Framework affirms to: accelerate and intensify national and international reduction of greenhouse gas emissions and short-lived climate pollutants, ensure

[78] Ibidem
[79] Ibidem
[80] Ibidem

conservation, restore, and promote the sustainable use of ecosystems and species. Moreover, "the objectives facilitate greater understanding of climate change impacts, adapt options through monitoring and research, including Indigenous-led and community-based approaches and regionally, nationally and internationally, strengthen pollution prevention and mitigation."[81]

The sixth goal aims to keep a cooperative and international order in the region; as mention before, Canada favors international law as the best tool to use in Arctic management. Canada is aware how the international environment is dynamic and it continuously changes with new challenges and opportunities. Nowadays, the Arctic is fully involved in this dynamism. The international rules and institutions need to adapt to this new period to provide the best tools to deal with constant changes. Therefore, Canada wants to boost its international leadership by cooperating with Northern countries to ensure a safe environment. Finally, the last goal set in the policy is dedicated to the defense of the country: the determination to exercise sovereignty over the Northwest Passage (NWP) is reiterated. This reiteration has been considered necessary by the Canadian government. Over the past decade, the area has attracted considerable interest on an international scale, becoming the subject of increasing competition from state and non-state actors, attracted by the region's natural resources and geostrategic location.

In conclusion, the Trudeau administration has been enthusiastic in portraying Canada as a world leader in Arctic development. Ottawa has positioned itself as a leader in Arctic governance, including scientific research. This has been achieved by focusing heavily on regulatory and co-management systems to reinforce the image of a country with a deep understanding of the Arctic. Due to concerns for its national security and the priorities of citizens residing in the northern Canadian territories, Ottawa's Arctic security policy tends to be more local than circumpolar and focuses on unconventional threats arising from the changing configuration of the Arctic.

2.4 International Organizations' role

States are not the only actors involved and connected to the Arctic region; indeed, it is necessary to analyze the role and the activities of international organizations. After the Cold War, the Arctic states agreed to transform the region from one of the most militarized areas to a place of peace and cooperation to fight economic decline and environmental degradation. However, the Arctic has always remained a strategic region for Euro-Atlantic security. NATO has direct connections and interests in the region. Indeed, five of its members, Norway, the United States, Canada, Denmark, and Iceland are Arctic states. The states agreed that the Arctic was necessary for the Alliance's security, and they felt the necessity to ensure the security and the protection of these territories; in the

[81] Ibidem

2016 Warsaw Summit Communiqué, NATO underlined its willingness to strengthen security of the borders through its maritime position and the increase of states' "comprehensive situational awareness".[82] US started to increase their role in the region, especially since when, in 2019, the former Secretary of the State Mike Pompeo denounced the Russian and Chinese attitudes in the region. Consequently, US disposed an important number of fifth-generation fighter planes and remobilized the US Navy Second Fleet for the North Atlantic patrolling. In 2019 the US Coast Guard released the Arctic Strategy Outlook. The Defense Department issued the Defense Department's Arctic Strategy, followed by the US aviation's one. US Navy and US Army published their strategies respectively at the end of 2020 and in March 2021. The issuing of these documents is ideally in time with the increasing internationalization of the Arctic: NATO understands that there are issues at stake, and wants to ensure its state's security without losing ground over non-allied countries. The Alliance decisions depend on states' consensus and reaching a common arrangement on how to act is extremely difficult. To mention a previous analyzed case, the Canadian Policy framework for the Arctic affirms "Canada's durable Arctic sovereignty" and similarly to this, there are other states' sovereignty claims in the region. The risk for the Alliance is not to reach states' consensus in its increasing activity in the region, risking to create suspects also in Southern and Eastern Europe.

There are two current views about the NATO's role in the Arctic. According to some experts, the Alliance should either increase its presence in the region and create a security forum with Russia or create its emergency plan. Other scholars own a softer position and disagree with this idea since there is no consensus among states, and the security issues should be better managed by the single Arctic States. NATO should play a limited role in the region, developing security and emergency plans and avoiding to create a conflict with Russia. The Alliance should conduct Arctic exercises without risking to become weak with an unnecessary opposition to the Kremlin; a specific new Arctic alliance command is considered unnecessary. NATO has different options and opportunities that need to be carefully assed not to create an unfriendly environment in the high north while keeping its power and influence. Then, through the years, scholars depicted different scenarios for NATO's role in the region; the most crucial policy options that need to be analyzed by NATO are four: improving training, partnerships, and non-NATO operations in the Arctic; try to include Sweden and Finland in the Alliance; create a NATO Arctic Command and create a NATO-Russia security forum. The first option includes military exercises speeding up in the region strengthening unilateral, bilateral and multilateral partnership outside the Alliance. This option is in line with NATO's activities with Norway and Iceland, including rotational presence and submarine port calls; implementing them at a

[82] Heads of State and Government participating in the meeting of the North Atlantic Council in Warsaw 8-9 July 2016, *Warsaw Summit Communiqué*, 2016, https://www.nato.int/cps/en/natohq/official_texts_133169.htm

non-Alliance level may develop share competences in low temperature exercises and strength the NATO's attention and capabilities toward China and Russia activities. Moreover, bilateral exercises may decrease the Russian attention toward the Alliance, reducing the risk of Russian military responses, already happened during past NATO exercises.[83] The second option regards the inclusion of Finland and Sweden in the Alliance; this would mean to include seven of the eight Arctic states in NATO, creating a real connection between European and non-European Arctic states. The several made assessments showed how the two countries have important means for the Alliance: Finland owns important land forces while Sweden has significant aircrafts and submarines. The third option of creating a NATO Arctic command would allow the Alliance to have a headquarter for its Arctic forces; moreover, it would add a plan, command and control unit to solve Arctic crisis and conflicts. According to this option, NATO would directly enter into the Arctic policy and governance, eliminating its side role in the region. Finally, the last option proposes creating a NATO-Russia forum to discuss Arctic security issues; this may favor the communication between the two powers and reduce the frictions. However, it seems unlikely since the already existing NATO-Russia Council suspended the military consultations between the two countries after the 2014 Russian occupation of Crimea. "NATO did show any intentions to change its position in this regard."[84]

In conclusion, a combination of the different scholars' position and ideas should be applied in the region. As the softer scholars' positions states, an Arctic alliance command may be premature and dangerous, risking increasing the tension with Russia. Moreover, this command could create internal problems within the alliance, and some Arctic countries may consider the priority of a NATO response as a weakening of their sovereign control over their territory. An Arctic command would clash with the Ilulissat declaration, where Arctic waters' national control prevails over multinational ones. However, the stronger stance affirms how the NATO's presence in the region should be increased. Despite the structuring of an Arctic command and a security forum with Russia is not the best option, the alliance should start conducting some exercises in the region. It should adapt itself to the fasting changing Arctic scenario and to its new centrality and importance. Some regular military exercises in the Arctic may start preparing the NATO for a future increase of threats in the region; in addition, they would start affirming the presence of the whole alliance in the region. These exercises should be conducted in a pacific way, trying to avoid as much as possible any suspects from Russia. They would also allow a robust monitor of the non-Arctic states' activities such as the Chinese ones. This could implement the operational activities and abilities of the alliance, preparing the ground for

[83] During the 2018 Trident Juncture NATO exercise Russia blocked GPS signals and in a 2020 exercise, Russia organized live-fire exercises

[84] David Auerswald, "NATO In The Arctic: Keep Its Role Limited, For Now - War On The Rocks", *War On The Rocks*, 2020, https://warontherocks.com/2020/10/nato-in-the-arctic-keep-its-role-limited-for-now/.

a future clash in the region. In that case, NATO would be ready and well prepared in acting. The increasing levels of international military activity and great power competition in the Arctic can no longer be ignored.[85]

Although the European Union is composed also by three Arctic States, Denmark, Finland and Sweden, the region has remained a niche policy for Brussels and most European governments. Numerous declarations have been made about the importance of climate change and security issues for the region, but few concrete actions have been done. This fragile region and its natural connection with the European Union require a total developed interest and intervention from the international organization. The last decade of the European Union involvement in the region has been uncertain, with a new involvement only recently. EU has natural connections with the far North because of its three Member States' commerce, trade, geography, legal competences and environmental impact. However, at the same time, the European Union did not manage to be fully part of the Arctic region's events. The reasons are the lack of direct access to the Arctic Ocean, which seems to be a key factor to be considered an Arctic actor, and a seesaw approach in the region. For these reasons, regional engagement is frequently dominated by particular interest groups focused on climate change, animal protection or economic initiatives. Thus, the debates in Brussels seem to be dominated by a conflict between those who would like to use the Arctic as an emblem of climate change and human inaction and those who call for a moderate approach that pays special attention to the Arctic states and security issues. Despite some critics arriving from some Arctic States, the EU has a right in the region and it is interested in being part of the Arctic international debate. In 2016, the EU updates the Integrated EU policy for the Arctic region to strengthen international cooperation, improve environmental protection, tackle climate change, and promote sustainable development in a region of enormous environmental and economic importance. Drafted by the European Commission and the High Representative for Foreign Affairs and Security Policy, this updated aimed to give a clear direction to the EU's efforts in the Arctic area. It intensifies existing engagement in the region through 39 actions focusing on three key policy objectives: protecting and preserving the Arctic region and supporting research on solutions to environmental impacts and climate change; promoting a sustainable use of resources and an economic development in cooperation with the people of the region and strengthen international cooperation through engagement and dialogue with Arctic states, indigenous peoples and other partners. The importance of research, science, and innovation cuts

[85] Anna Wieslander, "NATO Must Engage In The Arctic", *Defense One*, 2019, https://www.defenseone.com/ideas/2019/09/its-time-nato-arctic/159887/.

across these priority areas. They will be reflected in projects aimed at strengthening cooperation, curbing climate change, and ensuring the sustainable use of resources. Despite this policy, the Arctic activities of the EU have not been significant, and most of all did not transform the EU into a major Arctic actor. Its security role is limited, its ethical approach is criticized and its funding mechanisms not always efficient. The EU Global Policy Strategy published in 2016 underlined the EU strategic interest in the region; the main problem was the affirmation on how the European Union prefers to work in the region through the already existing regional organizations, including the Arctic Council, rather than acting alone to reach its own goals. Moreover, the 2016 Integrated EU policy for the Arctic region mainly deals with soft power issues such as environment, science, and development, not prioritizing trade and security. Several EU representatives are asking Brussels to increase its investment in the North and update its approach. The necessity is to make Brussels look at the Arctic from a foreign policy perspective: the EU can balance economic activities and environmental protection in the region. Moreover, a possible update of the Policy may influence the Arctic Council, the cooperation partner of the EU, that does not deal with security issues. This modernization may lead the EU to have a clear position and opinion about the military and commercial developments currently in place in the region, increasing its stake in the area. The EU representatives' request is essential when the EU application as observer in the Arctic Council is pending: Canada put the veto first because Brussels's ban of seals' import and then Russia because of EU sanctions during the Crimea occupation.[86] Moreover, the European Union has to assert itself rightfully as one of the actors that, not only has a natural role in the region, but also as an actor from which other states can no longer disregard.

In July 2020, the European Commission and the European Service for the External Action jointly began a consultation for the new EU's Arctic policy. The consultation, which will launch new discussions about EU's Arctic policy in connection with new challenges and opportunities, including the EU's ambitions under the European Green Deal, aims to gather input on the strengths and weaknesses of the current policy with a view to its possible updating. Consultations will contribute to review the EU's role in Arctic issue, and to review the three priorities, climate change, sustainable development and international cooperation, of the Integrated EU policy for the Arctic region. Moreover, previous conduct actions and possible new policy areas to be developed will be analyzed and discussed. The starting point should be based on three key aspects: first, what future scenarios are possible in the Arctic; second, which of these scenarios is plausible; third, how to experience these potential future scenarios. It is necessary to know more about the problems ahead, about the various

[86] Kevin McGwin, "The EU Moves Forward Toward A New Arctic Strategy — And A More Independent Role In The Region - Arctictoday", *Arctictoday*, 2019, https://www.arctictoday.com/the-eu-moves-forward-toward-a-new-arctic-strategy-and-a-more-independent-role-in-the-region/

possibilities that the Arctic holds for the EU, and the kind of preventive actions that is not only necessary but also feasible to build different regional future scenarios. EU needs to find the right balance between the future-oriented ideas of the Union's Green Deal and the current (and near future) need to have Arctic gas and oil in the EU energy mix. Cleaner and greener energy relies on raw materials and rare earth elements. As such, the Green Deal is expected to change the relationship between the EU and its neighbors, with profound geopolitical consequences and goals hoped to be achieved in the Arctic region. For instance, it is necessary to ask if Europe's dependence on China, or its relationship with Greenland will increase the demand for green technologies due to the newly established EU green standards.

EU policymakers need to question which issues are particularly relevant for the Arctic and which should be addressed more globally. For European policymakers and the EU's future Arctic policy, this means answering or, at least, individuate and analyze two fundamental questions. Firstly, "what does the Arctic mean for a block of 27 states at the beginning of an era of global change? Secondly, what can the EU do to shape the future(s) of the Arctic in a European approach?"[87] In conclusion, the natural question that emerges is what role the EU can play in the Arctic. EU has to increase the awareness of the Arctic potential and increase its presence not only in environmental terms but in security and economic ones as well. The region is highly dynamic, and the EU has to study and start to deal with the several shadows that characterize the region. Climate change needs to be considered a starting point for EU activities and not a destination point. The region is doomed to become a hot point where interests and claims of the Arctic and non-Arctic region will overlap; the EU has to find its legitimate place in the region before it will be too late.

In this uncertain framework, Italy found a place for its interests and activities in the region. Italy has been able, on the one hand, to take advantage of the EU Arctic programs and activities and, on the other hand, to develop its initiatives and politics in order to both benefit and contribute to the region. It will be interesting to discover which role Italy may have in the following EU Arctic Policy, considering its commitment and its advanced means and tools. As it will be later analyzed, Italy will be strongly impacted by a possible opening of new Arctic trade routes and in this way, several others European ports will be subject to the same phenomenon. Therefore, it is fundamental for the European Union to develop a new policy that can look at the Arctic in economic and commercial ways to prevent and manage possible future scenarios. In the next chapter, the main Italian activities, its important role and its capacity to exploit Arctic opportunities will be analyzed.

[87] Andreas Raspotnik, "The Presence Of The EU'S Arctic Future", *Www.Euractiv.Com*, 2021, https://www.euractiv.com/section/arctic-agenda/opinion/the-presence-of-the-eus-arctic-future/.

3. Italian Arctic opportunities

3.1 Italian involvement in the Arctic

Through the years, Italy carved its own space in the Arctic region until connecting its future and interests to the region. Its activities, opportunities, and the connected risks in the region are influenced by four essential factors: the historical-cultural bond with the region thanks to the Italian explorers who took part in missions to contribute to the discovery of the territories beyond the Arctic Circle; the political involvement of the country in the Arctic Council; a vivid scientific interest toward natural phenomena and environmental conditions in the climate changes' framework and finally, the economic importance of the Arctic Ocean and lands for what concerns both the extraction of energy resources and the Italian need to closely monitor the feasibility of the opening of Arctic trade routes. Italy's main interests and opportunities in the Arctic concern scientific research, meteorology, climate, Arctic challenges and effects of climate change, which in large part stem from the phenomenon of global warming. At the same time, Italy looks at an international accreditation in a geographically distant area but directly connected with its interests: economy, resources, and commercial routes are relevant issues for a country that owns advanced tools to play a crucial role.

3.1.1 Historical and political factors

The Italian involvement in the region can be dated back to 1899 when the Duca Degli Abruzzi expedition occurred; the ship "Polar Star" set sail from Arkhangelsk, a Russian port on the White Sea, in a northerly direction. The objective was to reach a desolate archipelago called "Franz Joseph's Land", one of the northernmost lands in the world. Luigi Amedeo of Savoy, the Duke of the Abruzzi, guided the expedition in collaboration with the Italian Geographical Society and the Italian Alpine Club. Once arrived in the Prince Rudolph islands, the program foresaw that the ship would have wintered in one of its bays; then, three groups with sleds would have left the island and directed to the pack, trying to arrive as far north as possible. However, the expedition could not reach the objective, but it arrived at never touched before. Subsequently, in 1926, Umberto Nobile crossed for the first time the Arctic Ocean in Alaska aboard the airship "Norge". Once again, in 1928, Nobile conducted the expedition aboard the airship "Italia". The main objective was to explore hitherto unknown areas by carrying out scientific surveys. On the way back, the airship crashed on the pack, north of the Svalbard Islands, causing the death of half the crew. A strong current that blew north of Svalbard towards the Land of Franz Joseph caused the accident; this unknown current was nicknamed

Italy in honor of the expedition that proved its existence. Nobile's expeditions are considered the first real Italian approach toward the North and the beginning of a long partnership among the Arctic and our country. Moreover, the joint actions to rescue the survivors from the accidents are considered the first real example of international cooperation in extreme weather conditions. The studies of Silvio Zavatti, an Italian explorer and anthropologist who dedicated his life to studying the peoples of the North, further testify the multiform Italian presence in the Arctic. He found the Polar Geographic Institute Silvio Zavatti, which manages the Polar Museum of Fermo, the only existing museum in Italy entirely dedicated to the Arctic region. The Italian involvement in the region is centenary. The country has tried to implement and improve its presence through the years in order to affirm itself as a country with strict and solid links, interests and attraction toward the northern hemisphere.

In 2013, Italy obtained the role of an observer in the Arctic Council, gaining an official position and influence over the Arctic issues. This role allows Italy to participate in meetings, contribute with its high level scientific and technical competences, advance proposal and contribute in economic terms. Therefore, the choice of Italy to join the Arctic Council as a permanent observer country has obvious geostrategic reasons, related to the need to intensify the political commitment and the already in place activities in the region. The special Italian Envoy for the Arctic, Carmine Robustelli, the Minister Plenipotentiary at Italy's Ministry of Foreign Affairs and International Cooperation, administrates this position.

In 2015, Italy released the first Arctic Strategy, updated in 2016, in which different and numerous Italian Arctic interests are set and illustrated. The strategy is composed of five main dimensions and final remarks. The first dimension delineated is politics: the strategy enhances Italy's importance and centrality as observer in the Arctic Council to concretely collaborate and have a voice in the Arctic issues; the strategy defines this position as a real acknowledgement of the significant Italian activities through the years. Indeed, Italy contributed at scientific level with the construction of fundamental observation's platforms and with several research activities and oceanographic expeditions in Arctic seas. The strategy underlines how, through the years, the Arctic Council has assumed a broader and fluid structure becoming a real stability instrument for the region. In this context, Italy totally assumes its responsibilities in fighting climate change to reduce the effects in the region, preserve its fragile environment and guarantee environmental security. Despite the political involvement, Italy respects and recognizes the national sovereignty of the Arctic states referring to the UNCLOS Convention; Italy, as a member state of the Convention, acknowledges its norms and principles in order to conduct responsible management of the Arctic Ocean. Moreover, the strategy underlines how Italy is currently part of some conventions that directly address Arctic issues: the International Convention for the Safety of Life at Sea (SOLAS), the Convention on Biological Diversity (CBD), and the International

Convention for the Prevention of Pollution from Ships (MARPOL). Italy is involved in International and European projects as well; in this international and dynamic framework, it encourages the promotion of exchanges of experiences and knowledge sharing in the region. The aim is to strengthen the bilateral relations with Arctic countries and create new opportunities, allowing positive outcomes for Italy as well. Moreover, Italy is part of several working groups in order to deepen specific Arctic issues and contribute to the regional development and protection. Its experts come from different Italian excellent scientific institutions, such the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) and the National Research Council (CNR). Finally, from a political perspective, Italy stresses the importance of the Artic Table (Tavolo Artico), the Italian roundtable where Italian interests, projects and challenges in the Arctic are discussed and presented; this is an extremely powerful and useful tool that has been instituted before the Italian application to the Arctic Council. Italy aims to affirm its political prestige and influence in a geopolitical arena destined to assume greater importance in the coming decades.

The Italian strategy presents the environment as the second key dimension; in this framework, Italy excels in scientific and technological research offering important tools and strategies to fight the increasing Arctic challenges: climate change, atmospheric pollution, loss of biodiversity, the environmental risk connected to maritime shipping, water pollution, and tourist activities' impact. Italy aims to fight these events, presenting best practices and innovative solutions to protect a fragile environment and highlight its quality and well-structured competences and techniques at the international level. The document presents several environmental parallelisms among the Arctic region and Italy; the first similarity is connected to both countries maritime and alpine areas. Similarly, to the Arctic Ocean, Baltic and Adriatic seas are characterized by poor water circulation and replacement, while alpine areas are characterized by technological, social and geographical isolation. Again, the strategy mentions the consequences of climate changes, sea level rising, and pollution as elements that characterized both environments. The document stresses how, despite the most significant effect of climate change are felt at the highest latitude, the main causes arise from medium latitude, as most of the black carbon production; in this regard, the reduction of the Short-Lived Climate Forces (SLCF) including methane, black carbon and ozone results essential for Italy. Moreover, Italy is fully aware of the increasing threats coming from the maritime shipping routes in the Arctic, which risk increasing the pollution of those sensitive areas. In the section's conclusions, the document mentions several international agreements Italy is part of, in order to highlight the Italian involvement in the international framework and stress and underline the importance of international cooperation to tackle threats of worldwide importance. The third section presents the Italian interest and attention toward the human dimension: urban areas and indigenous populations.

Considering the fragility of the Arctic region, urban development is presented as a critical factor. Italy refers to Swedish cities as a role model in sustainable design: they develop smart and precise planning of interactions among all relevant subsystems (energy, heating, waste cycle). This approach is included in the concept of "smart cities" that Italy aims to promote and support in the Arctic region. The Arctic's fragile environment constantly threatens its indigenous populations; unregulated hunting and fishing, loss of biodiversity, and alteration of arable lands are the most dangerous factors. In addition, the lack of connection among the inhabited land limits the population's socialization, education, and professional growth. In this regard, Italy refers to the Alps Convention, where objectives are set to improve services' accessibility and innovative organizational structures for remoted and hardly populated areas. The strategy's fourth dimension describes the Italian scientific approach; Italy aims to increase Arctic observation, both with coordinated monitoring and oceanographic research expeditions;[88] the ice-sea, permafrost, ice pack, and glaciers are constantly threatened by climate change, and Italy stresses its commitment in the region providing tools and expertise that can study, monitor and asses the continuous changing environment. The Italian Arctic Strategy mentions two of the most important Italian activities in the region: "the Research Center *Dirigibile Italia* in Ny-Ålesund and the Italian Polar Research ship OGS Explora, an Oceangoing Multipurpose Research Vessel classified as ice class IB, allowed to sail and collect data in polar regions."[89] The scientific dimension delineates some future strategic guidelines in order to tackle climate change, to boost the scientific research and monitoring procedures:

- Increasing the spatial and temporal extent of the Arctic observation system and strengthening coordination among national initiatives;
- Promoting the study and knowledge of another "dimension" of the Arctic system, its complexity, as integral part of the Earth system playing a key role in the Arctic amplification phenomenon as well as in the nature and entity of ongoing transformations;
- Defining, at various levels (European or international), the agenda and priorities for scientific research in the medium and long term.[90]

Finally, the strategy analyses the economic dimension; Italy has a long tradition in offshore oil & gas research and exploitation, but at the same time, it is firmly committed to its cultural and environmental heritage value. In this regard, Italy stresses the importance of finding compatible plans among

[88] Ministry of Foreign Affairs and International Cooperation, *Towards An Italian Strategy For The Arctic - National Guidelines*, 2015.
[89] Ibidem
[90] Ibidem

exploitation activities and environmental protection presenting itself as a role model. Therefore, Italy developed high-level security competences and tools also thanks to its home *avant-garde* industry technique. Thanks to its approach, Italy can guarantee solutions to infrastructural necessities and energy production and extraction in the Arctic; specialized services such as satellite control, offshore engineering and building, and navigation services are highlighted for their strategic importance. Italy's capacity to embark on pioneering ventures and combine advanced technology and preserve of its environmental and cultural heritage is its added value to an economic growth and sustainable development in the Arctic.[91]

Italy aimed at presenting the well-developed and detailed strategy for the Arctic region; the main goal was to analyze and describe all the different sectors Italy can actively contribute to; the outcome is both a well-being of the Arctic and a benefit for Italy. The Italian involvement has been consolidated through the years thanks to Italian institutions such as Leonardo, CNR, ENEA, and OGS. In this framework, the most important ambition is to implement and promote international cooperation both with official fora such as the Arctic Council and at the bilateral level with single Arctic countries. In this strategy, Italy presents itself as a responsible country willing to strengthen, in the future years, its commitment and cooperation with this highly vulnerable region; everything will be conducted in full respect of the environmental policy of the European Union and in compliance with international legislative tools.

Some criticisms are made toward the Italian Arctic Strategy. The first harsh critique has been moved toward the main reason that brings Italy in being interested in a region thousands of kilometers away: climate change. This is defined as a standard fare to justify non-Arctic states' presence in the region. Moreover, this climate policy is accused of being focused on an adaptation process rather than mitigation. Secondly, some criticisms regard the Italian parallelism between its maritime and alpines areas and the Arctic ones. Several elements have been considered inaccurate and superficial: the same level of vulnerability between alps and Arctic glaciers, the comparison between Baltic and Adriatic Seas and Arctic ocean presenting challenges emerging from enclosed sea (without specifying if the Artic Ocean is an enclosed sea or not) and the declared same level of isolation of the two mountains area; Greenland or Alaska's degree of villages' isolation is completely different from the Italian one. The comparison has been considered weak, and it shows some powerful ways to find some forced connections among the two areas. Moreover, the section does not discuss the fundamental similarity among the two environmental systems: ice thawing and permafrost presence. The urban areas and indigenous people dimension are characterized by some gaps as well. Italy mentions the Sweden model as a best practice for smart cities but it does not present any Italian case in this regard. Again,

[91] Ibidem

Italy draws comparison with Arctic villages without the presence of the indigenous people on its national territory. Moreover, in the fourth principle, Italy affirms how "local inhabitants have to be involved and informed", but this has been considered a scarce definition: it neither refers nor mentions the international law standards for a clear, former and informed consent, a co-management and a benefit sharing among Italian activities and indigenous people. The economic purposes of the country are harshly analyzed too; Italy presented itself as a country able to strongly contribute to the Arctic in terms of research and technologies, but the lack of affirmation about what the Arctic can give to Italy leaves some doubts. This is a recurrent approach of non-Arctic states: they present themself as essential partners for the Arctic states and not as countries also in need of energy resources and economic revenues. In conclusion, the Italian strategy is accused of referring to the wrong audience; it seeks to look for approval from Arctic States instead of referring to Italian institutions and stakeholders to clearly explain its role, its companies' participation in the region, and its plans. Italy has promoted an international approach in its policy, rather than stressing its own national contribution and plans.[92]

3.2 Research and scientific activities

The strength of the Italian strategy lies in several research activities it has been conducting through the years. The National Council for Research (CNR) is a prestigious research organization with the mission of internationalizing the national research system and providing cutting-edge technologies in both the public and private sectors; it is entitled to coordinate researches and activities in the region. In 1997 in Ny-Ålesund, the National Research Council built the Arctic station "Dirigibile Italia" a permanent base where research activities are carried out in various fields of interest for the region. The site works jointly with other international research groups to observe atmospheric phenomena and the chemical and physical properties of the surrounding environment. The aim is to determine the components of the energy balance at the surface, their temporal variations, and the role of different processes involving air, snow, ice, and land (permafrost and vegetation). The CNR realized three annex observational platforms in the Ny-Ålesund settlement, making the site a privileged headquarter for Italian activities. The first one is the Amundsen-Nobile Climate Change Tower funded in cooperation of the Department of Earth and Environment (DTA); the 32 meters high tower facilitates the know-how's understanding of the complex processes that connect the different components of the

[92] Rachael Scarpa, "Little Italy: Seeking A Niche In International Arctic Relations - Nordicum-Mediterraneum", *Nordicum-Mediterraneum*, accessed 16 September 2021, https://nome.unak.is/wordpress/volume-11-no-1-2016/01_double-blind-peer-reviewed-article/little-italy-seeking-niche-international-arctic-relations/.

climate (atmosphere, cryosphere, lithosphere, biosphere, hydrosphere). The second one is the Gruvebadet laboratory that performs monitoring activities through an aerosol sampling of optical, chemical and physical properties. The third platform is a fixed point of observation in the fjord called "Mooring Dirigibile Italia". In addition, Italy built the High Arctic Atmospheric Observatory, a base dedicated to long-term measures in Thule, Greenland. The CNR developed observational platforms exalting the multidisciplinary character of research in the Arctic; thanks to these platforms, Italy strongly contributes to the Arctic to monitor the climate system and the Arctic amplification. The activities in Ny-Ålesund involved not only CNR personnel but also personnel from other research organizations such as INGV and INAF and researchers of many universities, such as Perugia, Florence, Venice, and Roma Sapienza. This highlights how the national research in the Arctic, which the CNR Dirigibile Italia station represents, is a real hub of cooperation. CNR aims to consolidate and expand the Italian research in the Arctic in order to study, explore and discover the region; Italy promotes in this context an internationalization of the national initiatives to implement bilateral and multilateral agreements.

In 2018 the CNR released the 2018-2020 Research Arctic Programme (PRA) to achieve the objectives set by the Italian Strategy for the Arctic. Italy aims to ensure Italian participation in the International Arctic Science Committee (IASC), the Sustaining Arctic Observing Networks (SAON), and in the Ny-Ålesund Science Managers Committee (NySMAC). Italy focuses on providing added value to ongoing research through additional resources and synergy between the different activities; it encourages governance of the different individual initiatives consolidating the stability, continuity, and harmonization of Italian research in the Arctic. The PRA is approved by the MISE and MIUR ministries and elaborated on a triennial basis by the Scientific Committee for the Arctic. The CNR is responsible for the operational implementation of the Annual Program (AP), which must indicate the scientific and technological research activities, to be carried out in the Arctic, the necessary technical-logistical support, the human resources committed to the activities and the allocation of expenses. The PA must ensure participation quotas in favor of subjects, universities, public and private research bodies selected through public calls issued by the CNR. Research projects are evaluated and approved based on scientific, cultural and technical excellence.[93]

Italian research is included in a broad environment; indeed, Italy cooperates in the Arctic at both the international and national level, mainly in the Dirigibile Italia station. SAON and SIOS are some of the most important international projects and partnerships conducted within the PRA framework. SAON, the Sustaining Arctic Observing Networks, is a multidisciplinary context, the legacy of the

[93] Ministero dell'Università e della Ricerca, *Programma Di Ricerche In Artico 2018-2020*, 2018.

International Polar Year 2007-2009 [94] promoted by IASC and WMO [95] and politically supported by the Arctic Council. SAON has carried out an Arctic Observations Assessment Framework to identify better the observational network characteristics required to support the needs of the UN Sustainable Development Goals. Italy, through CNR, contributes to SAON by participating in the Science Board, in the works for the Arctic Data Committee (ADC) and in general observations and networks. Italy and SIOS developed a further international partnership; indeed, the CNR is a partner of the Svalbard Integrated Arctic Observing System (SIOS), a European research infrastructure to support the framework of an Integrated Arctic Observational system (INTAROS), a five years EU project. The SIOS is organized as a consortium where partners cooperate based on a non-legally binding statutes and a memorandum of understanding; Italy actively contributes to the system providing relevant research data; in this framework, one of the most essential projects developed by the CNR is Contribution of Vegetation and Soil components to the Carbon cycle in Arctic environment in relation to climate change (VegSoCA). Among the uncertainties concerning the contribution of permafrost thawing to the Carbon cycle, the processes associated with the vegetation and microbial activity in the soil are of extreme importance. The predictions foresee an increase in carbon net primary production in response to global warming and a consequent interaction with the C cycle; in this framework, "the project aims to understand and study how much of the forecasted CO_2 released by soil respiration due to permafrost thawing can be balanced by the CO_2 assimilation through photosynthesis."[96]

Italy develops important national partnerships; one of the most successful partners is OGS, the National Institute of Oceanography and Experimental Geophysics. Polar research is a pillar of the activity of OGS, continuously carried out since 1988. One of the most important Italian tools that helps and supports the research activities in the region, is the Polar Research Ship "OGS Explora"; this is a research ship defined as "ice class" since it owns elements and features to navigate and obtain data in polar environment. This ship is equipped with oceanographic and biological laboratories; it has conducted several activities in Canada, Greenland, Iceland, Norway, and the Fær Øer islands. INGV, the National Institute for geophysics and vulcanology, is a further Italian partner strongly involved in the region. The topics followed by INGV in the polar area include observations and geophysical analysis of very different elements: the atmosphere, the ice cap, the lithosphere, and the behavior of natural physical fields, such as the magnetic field and ionospheric observations. In the Arctic, INGV has been carrying out research activities since 2003 at the Ny-Ålesund station in

[94] The first polar year took place from 1882 to 1883; it is an international event dedicated to scientific research in the Arctic region to promote research and international scientific cooperation.
[95] International Arctic Science Committee and World Meteorological Organization
[96] "Waiting For The Sun To Shed Light On The Carbon Cycle | Sios.Metsis.Met.No", *Sios-Svalbard.Org*, 2018, https://sios-svalbard.org/VegSoCa_2018.

Svalbard islands and since 2009 at the American base of Thule, in Greenland. Finally, ENEA, Energy and Sustainable Economic Development is the last fundamental Italian actor involved in the region; here, the institute conducts researches and programs financed by the PRA; the main aim is to study and deepen Arctic phenomena called Arctic amplification.[97]

In 2020, the Italian Navy released the High North Multi-year Arctic Research Program for 2020-2022. The program is coordinated and conducted by the Italian Navy's Hydrographic Institute, with various national and international research organizations such as NATO and CNR. The High North research program was proposed for the three-year period 2017-2019 to support the national and international scientific community in the study of the marine sector of the Svalbard Islands and the Arctic Ocean relation to global changes. It is part of the Navy's Arctic commitment to consolidate and further develop the results of scientific research, particularly in the study of climate change. High North is mainly focused on the exploration and continuity of observations of the marine environment; to do so, it experiments new technologies of multi-platform systems as valuable sources of information for knowledge, development, sustainability, and environmental protection. The missions are conducted thanks to the NATO's ship Alliance, equipped with all the features and characteristics to operate in the Arctic environment. Ship Alliance is a research platform for testing new technologies and deploying next-generation systems and equipment for scientific research. The ship is one of the quietest of its kind, designed to ensure a minimum level of sound propagation in the water. This characteristic makes it a particularly suitable platform for those scientific experiments for which the absence of sound below the surface is essential. Approximately 400 square meters of laboratories, modern navigation and communication systems are present in the ship. The High North 20-22 program further confirms the Italian abilities and capacities to conduct high level and quality research and activities in the Arctic region. In October 2020, the results of the first part of the campaign had been presented and they have confirmed its reiteration for the next two years. The following years' activities will be developed in continuity with previous researches, explorations, and observations of the marine environment. Priority will be given to the areas north of the Svalbard Islands through hydro-oceanography, 3D-mapping tools, and the remote sensing and autonomous vehicles' integrated testing. For High North 2020-2022, the navy's hydrographic institute will also play an essential role in developing 32 state-of-the-art systems for navigational safety and environmental sustainability. This will be possible thanks to a new project called ARNACOSKY. The project represents the High North program's philosophy and aims to provide an integrated assessment of sustainability of Arctic routes; it will use solutions for environmental monitoring, forecasting and surveillance of the areas of interests. This will be conducted through the use of multiple platforms, including national

[97] Arctic temperatures are drastically increasing compared to the rest of the globe.

COSMO-SkyMed's radar satellites carrier.[98] This system consists of four satellites with radar sensors that can operate in all weather and visibility conditions; equipped with a high revisit frequency, provides high-resolution products to support routes.

3.2.1 Research's future prospects

The scientific sector can take advantage from numerous opportunities in the region; the vulnerable environment, the ice thawing and the climate changes are presenting optimal situations and conditions to study and analyze. Moreover, the opportunities to operate in the Arctic region will expand also thanks to an increase in the technological innovation. Cutting-edge technologies will create new opportunities for researches and their continuous development will allow scientists to keep conducting high level activities in the region. Indeed, remotely controlled vehicles, equipped with high-definition video cameras, have allowed scientists to collect specimens and identify numerous undiscovered creatures. New and more sophisticated coring activities to study Arctic ice will create opportunities and possibilities to keep highlighting the Italian activity in the region. Moreover, new further testing is underway on cutting-edge technologies, including drilling vessels capable of year-round operation. An additional future Italian objective will be implementing and boosting its presence in the region; Italy aims to keep enhancing its participation in the Arctic's research as a scientific and technological excellence. Continuous monitoring and experimental activities will permit the realization of the goal. These objectives will be conducted in the Ny-Ålesund experimental activities' framework, in strict cooperation with other nations' projects. The active participation in the SIOS initiative will extend the scientific interests and activities to the whole Svalbard Archipelago. The Italian research activity and the promotion of the Italian research system in Europe will be enlarged and further promoted thanks to the continuous participation in the European research infrastructure EUROFLEETS with the oceanographic ship OGS Explora. In addition, Italy aims to extend its presence in the pan-Arctic observatory system, especially based on bilateral agreements; the scientific and research cooperation will be an essential catalyst for this process. Meanwhile, Italy will keep consolidating its internationalization in the Arctic thanks to the sharing of large oceanographic infrastructures (research vessels, drilling systems, ROV) [99]. The Italian future look at developing a synergy between the Italian Arctic activities and the activities of PNRA (National Program of Research in Antarctica); this synergy will be developed through the standardization of the management of data coming both from the Arctic and from Antarctica, through an information system

[98] It is the first Earth Observation mission designed for dual civilian and military purposes. Its first- and second-generation satellites can scan the Earth from space in all weather conditions to help predict landslides and floods, coordinate relief efforts in case of earthquakes or fires, and control crisis areas from above.
[99] Remotely operated underwater vehicle

for the collection of all the metadata generated and acquired. The further crucial aspect will concern disseminating results and the enlargement of the Italian polar scientific community through the qualified training of young researchers. Finally, the continuous changing of the environment and of the region will allow Italy to promote and strengthen collaboration between different stakeholders at the national level, including universities and entities.

In the interview conducted at the Italian Institute of Polar Science, Vito Vitale, an atmospheric physicist of the CNR, underlined how the biggest challenge for Italy would be keeping and consolidating the Italian presence in the region. He underlined how despite the long Italian involvement in the territories, the region is dominated by Arctic countries, well-developed countries. Italy has to keep a high level and continuously valorize its activities in the region to give a significant contribution to the environmental security of the Arctic and support these countries. Vitale also affirmed how Italy has to exploit its bivalent activities both in the Arctic and in the Antarctic as a tool to enrich its research activities and initiatives. Few disciplinary communities in the world have a well-developed research system in both poles. The Italian expertise will be significant leverage for the following years in the region. Therefore, Nicoletta Ademollo, CNR researcher, stressed how Italy could export its best practices to study and manage climate change in the Arctic. The Arctic is a system that needs a broad contribution, and Italy is an actor that can highlight its capacities and distinguish itself. Finally, Warren Cairns, an analytical chemist of CNR, affirmed how Italy has prior knowledge in the climatic event that affects the Arctic: sea rising, fires, sea pollution, and air quality. The Italian monitor activities in its territories need to be exported in Arctic countries as well, in order to prevent and manage events that may increase damages to the region. Italian best research practices need to be exported and enhanced to increase and gain a leading role in the region.

3.3 Arctic as a profitable region for Italian economic activities

Several Italian companies work in the Arctic as active stakeholders guaranteeing an efficient and high-quality level and involvement in the region. They work and operate with advanced technologies in order to maintain the maximum respect for the Arctic environment and ecosystem. Because of the fragile habitat they operate into, countries are particularly selective in the choice of companies authorized to operate in the region; only those most environmentally sensitive, technologically advanced, and financially stable are suited to attempt these ventures in the Arctic. The Italian companies' presence in the Arctic context and commercial relations is increasingly profitable. Three are the main areas in which Italian firms are operating and will benefit from future opportunities: land, sea, and air. Italian economic and industrial participation in the region is an important confirmation of the high-quality means that the country disposes of. This participation is broad, long-

lasting, and well developed in order to ensure the best outcome possible: minimize effects on the marine habitat and biodiversity, enhance the wellbeing of indigenous people, improve operations' safety, oil spill preparedness and response capabilities, monitor infrastructures' and environmental integrity and secure route navigability. The Italian economic presence in the region is broad. It looks at different sectors and interests: research and business activities operate within the port and land-based technological infrastructures to ensure sustainable and extremely safe operations and activities. In addition, Italy ensures maritime safety and security in a delicate period. The region is subject to climate change and ice thawing; this allows Italian companies to develop and provide Arctic countries necessary tools and high-quality environmental technologies for their daily activities. Finally, the blue economy covers an important opportunity for Italy; the present and future prospects connected to marine resources create a vital arena for the Italian companies active in the sector. For Italy, the Arctic blue economy represents a social, scientific and commercial opportunity in the region; it creates an occasion to present general and green economic future prospects as an effective tool for the region. Therefore, Italy aims to implement anthropic actions on the environment in respect of sustainable standards; moreover, it promotes an economic development that looks at both preserving the existing conditions and at new employment formulas. This will combine essential aspects of the local economy with the protection, preservation, and enhancement of the fragile Arctic ecosystem.

3.3.1 Italian companies in the Arctic

Eni

Eni, Ente Nazionale Idrocarburi, is the Italian multinational company for energy and gas. It covers one of the most prominent roles among the Italian companies operating in the Arctic for the hydrocarbons' extraction. Eni is present in the region since 1965 in the Norwegian Sea, in the Norwegian North Sea, and the Barents Sea for the exploration and production sector. The Production Licenses regulate Eni's exploration and production activities in the region;[100] they authorize seismographic surveys, drilling and production activities until the contractual expiration, with possibility of renewal. Eni applies innovative operating standards and technological solutions consistent with extreme operating conditions, using innovative oil spill prevention systems. Through the years, Eni has diversified its mining portfolio in the region. In 2018, it completed the merger of Point Resources AS and Eni Norge AS, respectively controlled by HiTecVision and Eni, constituting Vår Energi AS, independent society for the hydrocarbons' exploration and production in Norway. In September 2019, the company acquired ExxonMobil's Upstream's assets present in more than 20

[100] Licences granted in licensing rounds in accordance with the Hydrocarbons Act

producing fields.[101] As a result of this acquisition, Vår Energi AS controls reserves and resources of more than 1.9 billion barrels of oil equivalent. By 2023, it will have a production of more than 350 thousand barrels of oil equivalent per day. Eni invested approximately USD 7 billion over the period 2020-2023 to develop projects and to support and diversify as much as possible its portfolio. This allowed Vår Energi to obtain 13 explorative licenses in the Northern Sea, Barents Sea, and the Norwegian Sea, both as a provider and partner. Vår Energi established itself as one of the main E&P[102] societies operating in Norway through the years. It is important to underline how 95% of Italian gas requirement is imported and therefore, Italy also depends on Norway for its gas supply. It is produced abroad and then imported via international pipelines or transported by sea in liquefied form as LNG and imported via regasification terminals; 46% is imported from Russian deposits, while roughly 8% comes from Norway. The imports' incidence from Northern Europe (i.e., Norway and the Netherlands combined) rose to 11.1% from 6.5% in 2018 thanks to the significant increase in the Norwegian share in 2019. Meanwhile, Eni's imports account for a decreasing share of 47.1% (52.3% in 2018).[103]

In 2020, Eni announced creating a new society called Vårgrønn, engaged in the development, construction, operation, and financing of renewable energy projects in Norway and in the Nordic market. The new company is based on the collaboration between Eni and HitecVision. It aims to pursue the opportunities offered by the offshore wind sector, participating in the upcoming tenders for offshore licenses in Norway and contributing to the decarbonization of Vår Energi's Upstream assets. Vårgrønn, a strategic step forward in the energy transition process, has a long-term goal of achieving an installed capacity of 1 GW in the region in 2030.

In 2016, Italy consolidated its presence in the area thanks to its most important Arctic project: Goliat, the biggest cylindrical floating offshore platform located in the Barents Sea for oil production and storage. The field's two principal reserves, Kobbe and Realgrunnen, contain both oil and, in the upper part, gas. The platform is expected to produce roughly 200 million barrels of oil in the next 15 years.[104] Sever Marine, a Norwegian company specialized in building platforms for offshore oil and gas extraction, built the platform. It was built in a South Korean marine yard and carried to the Barents Sea in 63 travel days. This is the first platform that has ever been activated so far north. The project

[101] The acquisition involves shareholdings in more than 20 producing fields

[102] Extraction and production

[103] "Gas. Importato Il 95,4% Del Fabbisogno Italiano; Il 46% Proviene Dalla Russia. Giacimenti Nazionali In Calo | E-Gazette", *E-Gazette.It*, 2020, https://www.e-gazette.it/sezione/energia/gas-importato-954-fabbisogno-italiano-46-proviene-russia-giacimenti-nazionali-calo.

[104] Lorenzo Angeloni, "Le Aziende Italiane Nell'artico Norvegese", podcast, *Farnesina Per Le Imprese*, 2020, https://www.spreaker.com/user/italymfa/angeloni-puntata-6-le-aziende-italiane-n.

organization took several years and two years longer than expected to be completed. Its cylindrical structure is a peculiarity. It has been designed to make it more stable and adapt to the extreme Arctic conditions, characterized by strong sea currents and winds gusting over 140 km/h. The platform's pipelines reach 22 wells that connect Goliat with gas and oil fields; it is one of the most essential plans carried out by Eni in recent years in terms of oil extraction. Goliat's oil field is located in Licence 229 (PL 229), an extraction area 85 kilometers northwest of Hammerfest, a small town in Norway. The Norwegian government made the license in 1997 and Eni obtained 65% of the extraction rights, with the remaining 35% going to the Norwegian national oil company Statoil Petroleum. However, despite the platform's economic revenue and potential offers, environmental security and maritime pollution always remain the main concerns in the region. Therefore, Eni applies innovative operational standards and technological solutions in conformity with extreme regional conditions to prevent an oil spill. The preservation of the maritime ecosystem and a low environmental impact are priorities for the company. Unlike other platforms that mainly use massive power generators, Goliat uses a hybrid power system thanks to an underwater cable that is used to send electricity from the coast to the sea. This solution will permit to reduce of 50% the CO_2 platform's emissions compared to traditional systems; moreover, the extracted gas is reinjected into the wells and not burned as it is usually done. Each well owns a specific monitoring system that can quickly detect any leaks so that timely action can be taken to reduce environmental hazards. The company has to present itself as a responsible actor in order to safeguard its interests and activities; it has to demonstrate sustainable and responsible exploitation of the deposit and a well-structured risk prevention and management to keep operating in the Arctic.

Eni is not exclusively active in Norway, but it conducts activities in Alaska as well. In 2011, Eni began its first Arctic project in North Slope Alaska precisely in Nikaitchuq field for 30 years. The Nikaitchuq wells, which benefit from the application of several Eni's technologies, are state-of-the-art as they combine a vertical depth of 4,000 feet with a horizontal reach of up to 20,000 feet. In 2018, Eni announced the acquisition of 124 exploration licenses, encompassing a total area of approximately 1400 square kilometers, from Caelus Alaska Exploration Company, LLC. The licenses are located in the Eastern North Slope, Alaska, and Eni holds a 100% interest. In early 2019, Eni agreed to acquire the remaining 70% of Oooguruk producing field.

Eni is particularly active in the Russian Arctic territories as well, and since the 60s, it started to import Russian crude oil in Italy. Two are the most important Eni's partners in the Russian Arctic region: Rosneft and Gazprom. The partnership with the former company began in 2012 when the two companies signed a cooperation agreement to have both explored fields in the Russian sections of the Barents Sea and exchanged technology and staff members. The agreements also established that, in

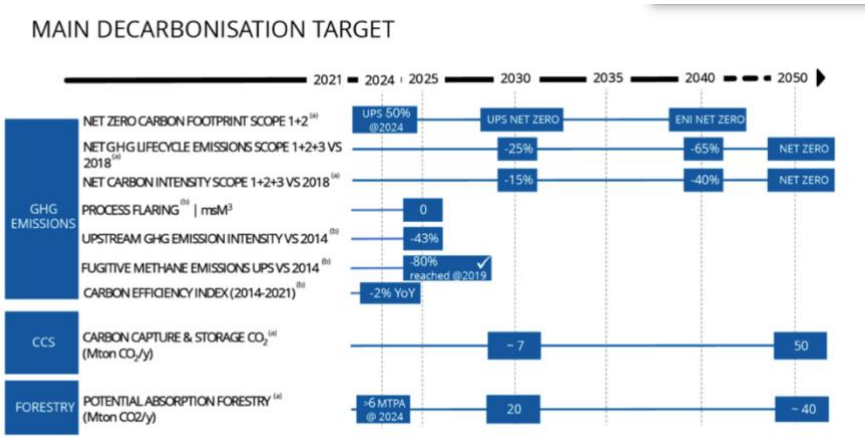
future joint ventures, Eni would hold a 33.3% stake, and it will finance the necessary geological exploration work to confirm the commercial value of the fields.[105] Furthermore, the technological exchange among the two companies is a decisive factor for the partnership; indeed, the Italian company can actively contribute to the different projects thanks to its considerable experience in Norway and Alaska. Nowadays, Eni is the major crude oil buyer from Rosneft. Gazprom is a further important partner for Eni. Eni started the collaboration with Gazprom in 1969 and in 2013, it became the major corporate importer of Russian gas from Gazprom. In 2017, Eni and Gazprom signed a memorandum of understanding including two main priorities: the companies' interest in exploring and deepening the future prospects for cooperation in the development of the southern corridor for gas supply from Russia to European countries, including Italy and modernization of the Russia – Italy gas supply agreements. The memorandum also mentioned considerations about a partnership in the LNG sector.

Eni is currently involved in a double challenge: fight energy poverty and reduce the emissions being in line with Paris' goals. Eni's decarbonization strategy aims to reduce the activities' intensity emission of roughly 43% by 2025 compared to 2014 levels, reaching net zero upstream emissions by 2030. These goals will impact the whole energy portfolio and, if the company wants to keep covering a leading role in the Arctic, it needs to monitor and update constantly its progresses. In recent years, Eni focused on the global theme of decarbonization, carving out a leading role in the application of sustainable standards in the oil and gas sector; it contributed in a fundamental way to the birth of OGCI (Oil and Gas Climate Initiative), participating in the Task Force on Climate-related Financial Disclosure (TCFD) of the Financial Stability Board. In this framework, the company created specific committees to support the board of directors presenting medium and long-term objectives.

The tables below show Eni's decarbonization and business targets for developing a continuous sustainable approach; these general goals are the primary reference for Arctic activities and represent a focus that the several extraction and production activities continuously follow. The decarbonization targets are divided into three main goals: greenhouse gasses emissions reduction, carbon capture and storage of CO_2 and forestry protection. The goals are ambitious and present a gradual reduction of emissions and an increase in the storage and absorption of CO_2. The business targets underline how Eni will be more sustainable while reinforcing its role as a global player in the energy world. It will be enriched by the progressive development of the renewables business, whose energy supply will reach 4GW by 2024, 15GW by 2030, and 60GW by 2050. New businesses based on circularity, the use of biogas and the recycling of waste will be developed. In addition, the production capacity of

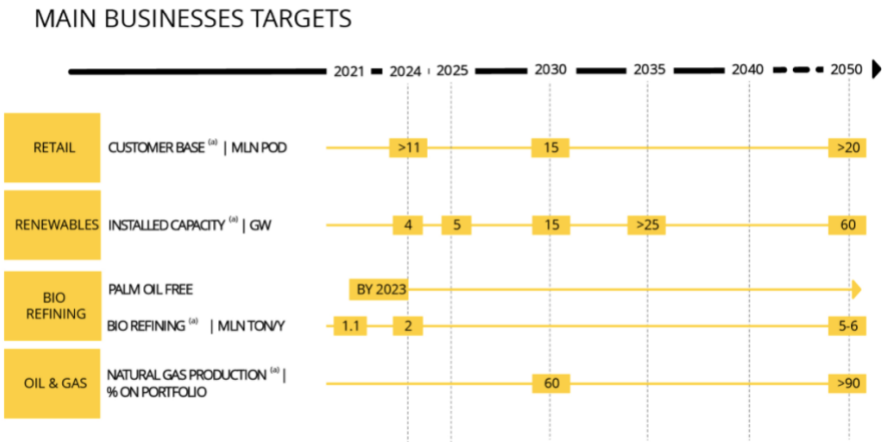
[105] "Rosneft - Eni", *Eni.Com*, 2018, https://www.eni.com/en_RU/eni-russia/partners-projects/rosneft/rosneft.shtml.

bio-refineries will be doubled to about 2 million tons by 2024 with a 5-fold increase by 2050, and the use of blue and green hydrogen to fuel Eni's bio-refineries and other highly energy intensive industrial activities will be increased. “These evolutions and goals will leverage know-how, proprietary technologies, innovation, and the flexibility and resilience of assets and will allow Eni to seize new opportunities for development and efficiency.”[106]



Eni's Strategy 2021-2050, 2021

https://www.eni.com/en-IT/low-carbon/strategy-climate-change.html



Eni's Strategy 2021-2050, 2021

https://www.eni.com/en-IT/low-carbon/strategy-climate-change.html

[106] "Eni’S Strategy For The Fight Against Climate Change", *Eni.Com*, 2021, https://www.eni.com/en-IT/low-carbon/strategy-climate-change.html.

Fincantieri

Fincantieri is active in the ship sector construction as a leading and high-quality company for what concerns the maritime sector. In 2018, Fincantieri delivered to the Norwegian authorities "Kronprins Haakon" ship, one of the most advanced icebreaker ships in the world, built to operate in polar waters. The ship has been delivered to the Institute of Marine Research (IMR), the Norwegian government's oceanographic and fisheries research organization. With a gross tonnage of 9,000 tons, a length of over 100 meters, a width of 21, and a maximum speed of 15 knots, it can move autonomously through a layer of ice up to one meter thick. It was built following criteria that minimize environmental impact and reduce the noise radiated underwater to allow studies of fish and marine mammals; moreover, it can carry out its oceanographic and hydrographic research activities in any operational theatre. The sensors and equipment installed are state-of-the-art technology and ensure very high flexibility in executing different scientific missions, allowing it to research in the fields of geology, geophysics, chemistry, and seismology. The ship will carry out missions on a global scale and it will be used to study the phenomena and consequences of climate change in the Arctic environment. "Kronprins Haakon" represents a significant technical achievement for Fincantieri, carried out thanks to the specific know-how developed in the many high sectors in which the company operates, including naval ships, submarines, cruise ships and special ships.[107] Moreover, the company built the "Alliance" ship for the Italian Navy currently in use for environmental observations in the Arctic region for the High North operation. Fincantieri is a clear example of the high-quality Italian innovation and technological system.[108] The possible future opening of Arctic Routes and the possible shift of the world trade toward northern latitudes may further boost the Italian company's crucial role. News ships and technologies may result essential to conduct safe and high-quality shipping in the Arctic region.

Leonardo

The Italian company Leonardo is one of the best examples of Italian innovation and efficiency in the Arctic region. The company operates in the aerospace, defense, and security sector, being one of the most important world actors. It develops high qualities advanced technological solutions and a complete and innovative range of services for every mission and scenario: helicopters, aircraft, electronics for defense and security and defense systems; moreover, it operates in the space sector with both civil and military activities. The company is intensely involved in the sustainable development of the Arctic region and provides excellent tools, instruments, and solutions for the

[107] Fincantieri | Consegnata la nave oceanografica Kronprins Haakon, *Fincantieri.Com*, 2018, https://www.fincantieri.com/it/media/comunicati-stampa-e-news/2018/consegnata-la-nave-oceanografica-kronprins-haakon/.

[108] Celestina Dominelli, "Alliance, La Nave Con Destinazione Artico Che Studierà L'Oceano", *Ilsole24ore.Com*, 2020, https://www.ilsole24ore.com/art/alliance-nave-destinazione-artico-che-studiera-l-oceano-AD9xgFa.

extreme weather and climatic conditions of the region. Thanks to its competences, technologies, and extensive experience in high technology sectors, Leonardo can offer a comprehensive, structured and scalable solution to fit primary Arctic needs: "improved maritime situation awareness, traffic monitoring, and safety geo-information needed on the sea status (sea ice melting, environmental monitoring) and real-time information availability."[109] Indeed, Leonardo is a leader in marine and coastal systems and censors production, earth observation and environment monitoring area. Specifically, the company aims to support Arctic Route navigability, constantly monitor the environment, increase the security and safety of the region and improve indigenous peoples' living conditions. The comprehensive Leonardo's Arctic offer includes platforms, and operational services, based on top-level technologies and integrated through a C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, Target Acquisition and Reconnaissance) control room, which provides management and intervention capabilities. Leonardo's satellite technology is already successfully deployed in the Arctic region. Its subsidiary e-GEOS, - a joint venture between Telespazio (80%) and the Italian Space Agency (20%) - has developed partnerships within Scandinavia. Numerous are the aims and the activities of the Italian company in the region; the first one is improving Arctic routes navigability to support Arctic transportation, tourism and high seas fishing. In this regard, it developed IMSA - Integrated Maritime Surveillance and Assistance System, a system that integrates all the available technologies to ensure safety and environmental protection against all types of threats at sea. The second fundamental aim of Leonardo is monitoring the Arctic environment to ensure environmental and ecosystems' protection. Thus, the continuous extraction activities of natural resources and the climate change instability require constant supervision of the region. Leonardo develops and adopts different integrated operating systems to precisely monitor territories and their natural resources that can intervene in adverse circumstances and far-off territories. Satellites to constantly monitor the atmospheric and meteorological conditions of the areas, manned and unmanned vehicles, sensors and multispectral technologies (hyperspectral infrared, etc.) and software applications are constantly in used and provided for the countries in need. In this framework, Leonardo is involved in the Arctic Security and Emergency Preparedness Network (ARCSAR) project to improve security and sustainable development in the Arctic. The project is promoted by the European Union as part of Horizon 2020, with a duration of five years; it aims to encourage discussion on aspects of safety, emergency response, and technological and sustainable development of the Arctic. Leonardo, through e-GEOS, is the only industry to participate in ARCSAR. It provides ARCSAR with a unique asset in terms of know-how and innovation: from

[109] "Leonardo-Finmeccanica For The Sustainable Development Of The Arctic", *Esteri.It*, 2016,

SAR (Search & Rescue) helicopters, already used by Canada, Denmark and Norway to systems for maritime patrolling, communications and satellite data and images, integrated technologies and solutions to prevent and mitigate the effects of climate change, in line with the Sustainable Development Goals of the UN 2030 Agenda.[110]

The third main objective of Leonardo is to improve general security and safety in the Arctic; to comply with this objective, it disposes of and provides systems control and manage the sea and air traffic and systems to improve the situational awareness surveillance, and response capabilities in the area. Finally, the company aims to support indigenous people's welfare increase and guarantee social networking, safety, and health. The company provides and use telecommunications' systems to allow communication in the remote Arctic regions, communication services such as e-learning and e-medicine to favor accesso to medicine and education, the improvement of infrastructures' management and safety and efficiency.[111]

Due to the numerous phenomena that are threatening the Arctic, such as climate change, opening of the Arctic routes and ice thawing, the company will increase its presence and activities in the region to protect and safeguard a precious and vulnerable environment. Therefore, the company's future potential contribution results profitable and beneficial. The opening of new Arctic commercial routes and the consequent increasing commercial trade will require a more active surveillance's role to deliver, in optimal timing, important and crucial information to decision makers; moreover, the situations will require faster modalities of intervention. Leonardo is well equipped and organized to keep increasing its presence in the region and provide high-qualities solutions and tools to the Arctic countries. In addition, the company will cover a leading role in the sustainable development of the region thanks to the before-mentioned tools such as satellites, radar and aircraft for time saving interventions. In the coming years, Leonardo will keep developing optimal services and tools and investing in dual-use and multipurpose capabilities.

3.4 Future prospects and scenarios

In the following years, Italy will still be able to cover a crucial and decisive role in the region. In the interview conducted with the Italian Ambassador in Oslo, Alberto Colella affirmed how Italy has wide space in the political debate and future economic development in the Arctic. He underlined how

[110] Federico Cerruti, "Artico: La Partecipazione Di Leonardo Al Progetto Europeo ARCSAR – Analisi Difesa", *Analisidifesa.It*, 2021, https://www.analisidifesa.it/2019/03/artico-la-partecipazione-di-leonardo-al-progetto-europeo-arcsar/.

[111] Paola Toniolo, "Finmeccanica In The Arctic- Sustainable Development", in *Arctic Conference Climate Change And Future Scenarios In The Arctic Region*, 2014.

the region is the object of increasing attention, not only for the usual issues related to global warming and climate change but also for the new economic opportunities these phenomena offer. Italy is ready to contribute to Arctic states' work to strengthen political and economic collaboration in the Arctic, aiming to find the right balance between sustainable economic development and environmental protection. Therefore, Arctic states are interested in cooperating with non-Arctic states for the development and protection of the region. However, when discussing the future scenario for the Arctic, it is always necessary to distinguish between Arctic and non-Arctic states real interests and concerns; while for the former, the ice thawing is always considered a negative phenomenon, for the latter, the environmental damages are compensated by economic revenues and possibilities of Arctic navigation. Therefore, it is necessary to monitor the situation cautiously and have a particular sensitiveness for the interests' differentiation. In this framework, Arctic Council's guidelines and principles need to be fully respected by non-Arctic states involved: respect of Arctic states' sovereignty, respect of international law, and promotion and respect of indigenous peoples' local tradition and values. These principles need to be observed in every conducted activity. The Ambassador also remarked that Italy is an original party to the Svalbard Treaty. Therefore, it considers it a crucial tool to ensure its full and effective participation, in close and constant collaboration with the competent Norwegian authorities. Discussing the Italian scientific involvement, he was confident about the continuous and productive role of the Italian research activities as the main engine of the future Italian involvement in the region. It is essential to remark how the Italian involvement in the region began for explorative and research aims; Italy will keep mainly focus on this specific activity. Climate change is posing important threats and creating new challenges and opportunities that the Italian research can seize. New studies, research, and exploration, will be conducted in the region in order to keep studying and analyzing the most critical effects of climate change in the following decades. One of the main peculiarities of the Arctic is the necessity of being present in the region with a high level of technological development and tools; Italy boasts a very high level of equipment in the sector, thanks to which it has gained an advantageous position in the region that ensures safe and cautious participation in the area. Scientific research is a key weapon in the fight against climate change. The expectation is to obtain a better understanding of possible changes in environmental processes in the Arctic regions. The results will not provide, perhaps, a definitive solution to the problem, but will allow a better understanding of the causes and consequences in the medium term, a fundamental starting point in identifying the right path to undertake.[112]

[112] Alberto Colella, Interview conducted to the Italian Ambassador in Norway Alberto Colella, 2021

The Italian political involvement in the following years will be solid and constant; until now, its role as observer in the Arctic Council has guaranteed a vital contribution to the region and has represented an important resource for the region. It has demonstrated a high level of participation and involvement, confirmed by the biannual fact-finding survey conducted in 2018 by the Italian III Commission of Foreign and Community Affairs. Italy will contribute to keeping the Arctic a low-tension and high-cooperation area in the coming years, meeting the Artic states' primary goals and needs. The militarization of the Arctic, the increasing tensions among NATO and Russia and the increasing effects of climate change threaten the region's equilibrium. Therefore, Italy commits and will keep committing itself to the preservation and the maintenance of the area's peacefulness in line with its guidelines set in the 2015 Italian Arctic Strategy. Analyzing the Italian Arctic Strategy, it emerged that the world "security" appeared only seven times in the text, every time about environmental concerns and marine protection, while the world "defense" is not even mentioned. Therefore, it is clear how the Italian Arctic strategy involves neither a military apparatus nor a defensive attitude or military cooperation. Despite the Italian maritime and military capabilities, Italy does not present itself as a military actor in the region. The political weight of the country will be a significant element to influence and discuss possible developments and frictions of the region. However, it is essential to consider how the future opening of the Arctic routes, the increasing international importance of the region, and the climate change might change the security level of the region. Several significant Italian platforms and interests in the region might be in danger: Eni and Leonardo represent a crucial landmark in the region. They and other international interests could be subject to transitional maritime crimes such as attacks, illicit activities, or even piracy. Moreover, the Arctic routes may favor illicit traffic of drugs and weapons across the region; the tensions among the countries interested in the region could grow, and states could use non-state actors to sabotage them and their assets. Transnational crime will not be a phenomenon of large-scale, since climate change, fragile conditions, and the political stability of the region do not create a favorable environment for them. Nevertheless, the possibility of their emergence should not be underrated. "In their current state, Arctic countries do not have neither a system-based understanding of these threats, a differentiated approach to assessing specific types of potential maritime criminal activities, nor developed practical measures aimed at their prevention and suppression." [113] Most of the Arctic states lack resources and know-how to address the threats that could emerge from the increasing accessibility of the region. Consequently, Italy might reevaluate its role in the region in connection

[113] A. Todorov, "Assessment Of Threats Related To Maritime Crimes In The Arctic", *World Economy And International Relations* 63, no. 9 (2019): 104-111, doi:10.20542/0131-2227-2019-63-9.

with the possibility of growing security threats. Italy disposes of significant companies that nowadays conduct different activities; therefore, it is fundamental to consider the Italian companies' dual-use in the Arctic. Indeed, Leonardo, Eni, and the Italian Navy dispose of means that can be used both for a civilian aim and future security and military interventions and cooperation in the region. The Italian military presence in the region may cover a more substantial role, offering support, training, and cooperation to Arctic states according to the varying national security level. The only national security-related body Arctic countries have is the Arctic Coast Guard Forum; "this is an independent organization, not bound by a treaty, to foster safe, secure, and environmentally responsible maritime activity."[114] Therefore, it would be helpful to create cooperation and coordination between this forum and possible non-Arctic countries to develop joint measures, provide training and capabilities to prevent and eventually tackle potential maritime criminal activities in the Arctic. Although Italy will not cover a primary role in the region, it owns significant interests and activities. The Italian know-how, abilities, high-quality instruments, and military capabilities need to be considered in the future Italian involvement in the region. Further joint European missions can be deployed in the region, protecting different interests at stake and connecting European and Arctic navies. The training activities that the Italian Navy conducts in some parts of the globe, such as Libya, may be hypnotized as resourceful for the future Arctic security.

From an economic perspective, the Italian industries aim to be part of the Arctic sustainable development and the delicate environmental equilibrium. According to Minister Plenipotentiary Carmine Robustelli, the special Italian envoy for the Arctic, the Italian industries will keep covering an essential role in the region thanks to their advanced technology disposal and competencies; in the interview conducted, he affirmed how the Italian future contribution to the Arctic will be remarkable and fully in line with the environmental standard and principles of this fragile region. In the following years, Eni will keep covering an essential role in the region for the extraction of hydrocarbons. They will remain an essential energy source; however, the energy sector concentrated on traditional sources can and is being extended to renewables, in a complementary manner.[115] Therefore, Eni has a vision of sustainable development; Italy has indeed recognized that a corporation, a company, and a center of economic interests can cooperate with countries that jealously defend their heritage. It is essential to point out that the damage of the Arctic fragile heritage would be incomparably more significant than the possibility of profit for the company. In addition, Eni's future activities in the Arctic will deal with a triple scenario. The first extractive activities will be directed at an "operable Arctic", an ice-free environment where the operative solutions are based on already existing technologies. The

[114] "ACGF", Arcticcoastguardforum.Com, 2021, https://www.arcticcoastguardforum.com/about-acgf.
[115] Carmine Robustelli, Interview conducted to the Min. Plen., Special Envoy for the Arctic Carmine Robustelli, 2021

second scenario is a "challenging Arctic" where drilling and production activity requires improvements to existing technologies and investments that can be pursued in the medium term (five to ten years). Finally, the "extreme Arctic" which implies indigent investments for a period of times that goes from ten to twenty years. In conclusion, all Eni's future activities and operations will be proportionate to the availability of technological developments that will ensure sustainable developments, including cost-effectiveness, while minimizing environmental and social aspects. Minister Robustelli underlined how Eni and other Italian companies' participation to the Italian Arctic Table is crucial; they have the possibility of having a dialogue and being part of a system that allows them to clearly express their positions and aims in the region.

The shipbuilding sector has important perspectives and opportunities; if the Arctic routes are opened in the following decades, Fincantieri will be ready to cover a prominent role. It is the world's fourth-largest shipbuilding group and the world's first non-South Korean group in the region, designing ships at the forefront of polar research. However, navigation in the Arctic would be different from the traditional one. It will be necessary to develop ships and equipment able to navigate the frozen sea and extremely low temperatures.[116] Fincantieri has already demonstrated its abilities and capacities in delivering ships to the Arctic countries, providing Norway an oceanographic icebreaker ship thanks to a 2000 million euros investment. In the following years, Italy can guarantee a low-environmental impact ships and technologies supply. Italy needs to keep working with IMO ad Arctic Council to deliver this plan. Two are the main goals: meeting the environmental priorities of the region with the Arctic objective of making maritime navigation safer and making Italian technologies essential and indispensable for Arctic countries. In addition, the importance of the blue economy in the Arctic region is gaining growing attention. Considerable prospects are linked to the use of maritime resources and the implementation of research and business related to port and land-based technological infrastructures. The goal is ensuring the performance of sustainable and extremely safe activities and improving marine safety and control. The social, scientific and commercial concept that the blue economy wants to represent consists of elaborating a system that scrutinizes the economic prospects and the green economy. These represent an improvement of anthropogenic actions on the environment. This economic development looks at the preservation of the existing and new employment formulas that can combine important aspects of the local economy. All activities that must be conducted with the protection, preservation, and enhancement of the fragile Arctic ecosystems.

[116] III Commissione permanente (affari esteri e comunitari), *Indagine Conoscitiva Sulla Strategia Italiana Per L'artico*, 2018.

The Ambassador Colella underlined how E-Geos could be one of the most promising societies in the coming decades. E-Geos can play an important role for mapping the Arctic region in connection with all the economic and social activities that will be conducted. Clear, and real-time mapping will always be more necessary for Arctic navigation, oil spill, fishing, search and rescue, and meteorology. Next to the scientific component, e-GEOS analyses which possibilities of development and accompanying sustainable development of activities in the region are possible. This regards global connectivity, the possibility to observe the earth, and, of course, the possibility to combine all this information with satellite positioning and navigation. Moreover, the Ambassador underlined how prospects and scenarios would likely be connected to the tourist and cruise sector. In the Svalbard island some small entrepreneurs are already operating in the region, while French and Norwegian companies currently dominate the cruise sector; however, when the navigation's condition will improve the Italian cruise companies will start to look closer at the sector certainly finding room for their activities. Finally, Leonardo's presence demonstrated itself as essential in the region. Its high qualities equipment will allow the company to cover an increasing role in the area, and the possible future opening of Arctic routes. Helicopters, drones, radar, and additional tools are essential in this fragile region that needs to be protected and safeguard.[117]

During a very recent conversation about the Arctic between the Undersecretary for Foreign Affairs Benedetto Della Vedova and the Norwegian State Secretary Audun Halvorsen (April 26th , 2021), the prospects of the Italian economic presence in the Arctic were widely discussed. Halvorsen affirmed that in the economic race to the Arctic, Italy seems to have an advantageous position, precisely because of its already consolidated scientific and entrepreneurial presence: "Everyone in words wants to have a piece of the Arctic - said the Secretary of State - but Italy also has the resources and the business network to do it". [118]

Minister Robustelli underlined how all these future scenarios represent both opportunities and challenges for Italy; Italy wants to flank the Arctic states and ensure that Arctic tensions are as low as possible while finding a place for its economy and activities. Italy needs to find the right balance between these two objectives in order to keep a prominent role in the region and keep cooperating next to Arctic states. However, the most severe challenge Italy has to deal with in the region is climate change. Climate change influences all the before mentioned activities, and although it creates some opportunities in terms of research and possible economic activities, it needs to be addressed. It is

[117] Alberto Colella, Interview conducted to the Italian Ambassador in Norway Alberto Colella, 2021

[118] "Talks Between Deputy Minister Della Vedova And The Norwegian Secretary Of State Halvorsen", *Esteri.It*, 2021, https://www.esteri.it/mae/en/sala_stampa/archivionotizie/comunicati/2021/04/colloquio-tra-il-sottosegretario-della-vedova-e-il-segretario-di-stato-norvegese-halvorsen.html.

necessary not to forget the main driving factor of Italian activities in the region. The individual Italian activities will not be enough to fight this increasing threat to the region; this is why Italy aims to keep cooperating in bilateral and multilateral ways with the Arctic and non-Arctic states. Different partnerships, tools, and knowledge sharing will be an essential asset in the region. Italy has to present itself as a role model for future cooperation's and states' interactions. New international treaties and agreements need to be developed in order not to let the Arctic fight the biggest challenge alone. What Italy will do in the Arctic in the following years depends on its current activity. The relations between how the countries behave and how they impact the Arctic is the big challenge. Italy aims to occupy a central role in the region, boosting and implementing the internationalization of the region to call the attention on climate change and its effects. The future prospects need to be based on the necessity to build a government perspective of this space starting from environmental issues. The coming COP joint Italian leadership with the United Kingdom might represent a momentous occasion to stress this crucial challenge. The Arctic will be increasingly included in international contexts, and it is precisely there that Italy has to place itself. For the Arctic, it may be crucial what is decided at the COP level or the IMO level instead at regional one. This is why Italy has to keep representing an active actor interested in the region both at national and international level. In the following decades, the opening of the Arctic routes will attract an increasing attention toward the region, risking to worsen the environmental precariousness of the area; Italy has to keep working with the Arctic Council and Arctic states to ensure the protection of the area, to monitor the shipping activities and keep providing its high-quality tools and systems that can be a turning point in the management of the Arctic shipping. To conclude, it is possible to affirm how it is not only Italy that is looking at the Arctic, but the region will need the Italian presence and tools in the following years.

4. Arctic routes and implications for Italy

4.1 Ice melting: the opening of new commercial routes

Climate change and global warming seriously damage the Arctic region, causing significant ice melting and ice cover reduction. Despite the negative environmental impact, these phenomena are opening new opportunities in the Arctic, presenting a new frontier for maritime activities. Indeed, new Arctic routes are opening up, creating future scenarios and prospects in world trade. In this context, the hierarchies of international trade show changes due to the need to search for modes of transport and routes that can provide carriers with less onerous and faster routes. The studies affirm that by the mid-century, the Arctic may be completely free of ice in the summer period, strongly influencing the world maritime commerce's viability. This condition creates several opportunities in the maritime sector: offshoring, transport, trade, search and rescue, and new building vessels accessibility to natural resources. "These prospects recalled the European attempt of the XVI-XIX centuries to discover shorter commercial routes to Asia or the Manhattan project to develop a commercially viable tanker route across the Northwest Passage."[119] However, the focus is not only on the economic potential of the new routes but also on the different interests at stake for different countries toward a more accessible crucial area: geopolitical influence, increasing role in the northern hemisphere, and the energy potential of that area. At the same time, it is essential not to forget the potential impact that the new routes may cause on the vulnerable Arctic region due to a possible, increasing human presence among those areas. Three are the main routes under careful observation that have the potential to shape the future commercial Arctic shipping: the Northern Sea Route (NSR), the Northwest passage (NWP), and the Transpolar Sea Route (TSR). In addition, the Arctic Bridge, a minor shipping route linking the Arctic seaports of Murmansk (Russia) and Churchill (Canada), could also develop into a future trade route between Europe and Asia.[120] The three routes occupy an area of 14.75 million sq. km in the Arctic ocean covering 18 million cubic km. of water.

[119] Frédéric Lasserre, "Case Studies Of Shipping Along Arctic Routes. Analysis And Profitability Perspectives For The Container Sector", *Transportation Research Part A: Policy And Practice* 66 (2014): 144-161, doi:10.1016/j.tra.2014.05.005.

[120] Malte Humpert and Andreas Raspotnik, "The Future Of Arctic Shipping Along The Transpolar Sea Route", in *Arctic Yearbook 2012* (Northern Research Forum and the University of the Arctic Thematic Network (TN) on Geopolitics and Security, 2012), 282.

SRM on Amsa, Arctic Portal 2018search Service Report, 2020

https://www.assoporti.it/media/6847/arctic-route-2020-isp-srm.pdf

The global idea of these routes is to move and deviate part of the shipping trade toward the North in order to reduce costs and time compared to the traditional routes such as Suez and Panama Canal. There are four types of voyages that it is possible to undertake in the Arctic Ocean:

Destination transport: a ship sails to arrive in the Arctic, conduct some activities in the region and then sails back to the south. Some examples are cruise ships that sail from southern ports to some Nordic countries during summers or icebreakers from Europe conducting scientific research and activities in the Arctic region.

Intra-Arctic transport: consists in an activity conducted within the Arctic region connecting two or more Arctic States. Two examples are Icelandic fishing vessels operating in Greenland's waters and the Arctic bridge route.

Trans-Arctic transport or navigation: includes voyages across the Arctic Ocean from Pacific to Atlantic oceans or vice versa. These include the three before-mentioned arctic routes: NWP, NSR, and TPP.

Cabotage: consists in the activity of shipping domestic goods by sea between ports in the same state. Some examples include the cargo's sealift from southern Canadian ports to northern Canadian

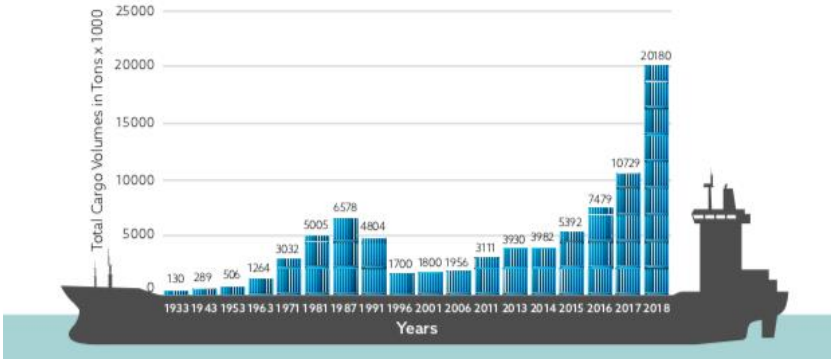
communities or delivering consumer goods to Russian Arctic communities from Russian ports through the NSR.

However, it is essential to analyze and study the potentials and challenges that these routes will present to world trade. In the specific, one-third of the maritime transported goods from and to Italy passes through the Suez Canal. The development and the possible opening of the Arctic routes may move countries like China to prefer northern passages to the traditional Indian Ocean and Suez Canal. Therefore, it is essential to understand if and which impacts these routes will have on the Italian port systems and commerce.

Northern Sea Route

The Northern Sea route is the route that connects Europe to Asia, stretches from the Bering Strait in the east, between Siberia and Alaska, to Novaya Zemlja in the west, crossing the Barents Sea, the Kara Sea, the Laptev Sea, the East Siberian Sea, and the Chukchi Sea.[121] The route covers 2,200/2,900 nautical miles. In 1932, the Council of People's Commissars of the USSR decided to separate this route from the Northeast passage in order to have a fully Soviet jurisdiction over it. Nowadays, the route makes up 90% of the Northeast passage. It is important to underline how the NSR is not a single route, but composed of different passageways along the Russian Arctic, covering a significant portion of the Arctic Ocean. This route is already open during certain periods of the year, especially during the summer months. The ice condition along NSR vary across the years. One of the most interesting peculiarities of the Barents Sea is that it is never completely covered by ice, unlike Kara sea; indeed, the ice makes up roughly 50-60% of the total sea area during the winter. Although its main aim is to connect Europe and Asia for trade purposes, along its way, important reserves of oil and gas are concentrated, making it increasingly attractive for states. Since the 30s, the cargo flow across the NSR increased because of Siberia's industrialization in the Soviet period. In 1996, after the USSR dissolution, the flow drastically decreased, reducing the NSR crucial transport system's role. Since 2011 the shipping volumes increased again due to the rapid effect of climate changes and the consequent ice thawing. Indeed, the volumes reached 10.7 million tons in 2017 and 20.1 million tons in 2018, increasing five times since 2014. The main driving factors of the increasing cargo in the region are natural resources discovery, exploitation and extraction; therefore, they started to be shipped toward Europe and Northeast Asia faster.

[121] "NORTHERN SEA ROUTE - Arctic Bulk", Arcticbulk.Com, 2021, http://www.arcticbulk.com/article/186/NORTHERN_SEA_ROUTE.



Northern Sea Route Administration and Rosatomflot, 2018

https://businessindexnorth.com/sites/b/businessindexnorth.com/files/binrapport2019_small.pdf

One of the most important characteristics of the NSR is its depth: indeed, the coastal waters are less than 100m dept characterized by several straits blocked by pack ice. Some of these straits also present draft restrictions on vessels navigating because of 21-20 meters deep. Consequently, this significantly reduces the ships' tonnage. The Yugorskiy Shar Strait at the southernmost entrance from the Barents to the Kara Sea is a channel of 21 nautical miles long, and it is 12-30 meters dept, while the eastern side of the Laptev Strait has a depth fewer than 10 meters, restricting the draft of ships to less than 6.7 meters. The marine areas west of the Yamal Peninsula are fortunate to have a slightly deeper shelf and lighter ice conditions on average than the eastern sector. This is partly due to the Kara Sea's circumstance to the north surrounded by several archipelagos that usually prevent heavy multi-year ice from the central Arctic Ocean from entering these waters. The waters along the NSR between the Kara Gate to Cape Dezhnev is administered by the Russian Federal institution "Administration of the Northern Sea Route" (NSRA) with the main targets of "ensuring safe navigation and protection of marine environment from the pollution in the water area of the Northern sea route".[122] The NSRA manages the Russian icebreaker fleet, which is currently the largest in the world. It evaluates if icebreaker escort is needed and administers vessels' fees related to icebreaker escort service in the NSR.[123] Moreover, the NSRA provides forecasts about ice extension: it determines if icebreaker assistance along the route, according to the ice classification of the ship crossing the NSR, is necessary or not. The route is expected to be the first route utterly free of ice, representing the most

[122] *Navigating The Northern Sea Route Status And Guidance*. Northern Sea Route Administration, 2015.
[123] Dimitrios Dalaklis, Megan L. Drewniak and Jens-Uwe Schröder-Hinrichs, "Shipping Operations Support In The "High North": Examining Availability Of Icebreakers Along The Northern Sea Route", WMU Journal Of Maritime Affairs 17, no. 2 (2018): 129-147, doi:10.1007/s13437-018-0142-7.

crucial commercial potential for the future of Arctic shipping. The route is expected to reduce the journey between Europe and Asia by roughly 9.000 km, compared to the traditional Suez Canal route, cutting shipping times by 10-15 days. 31 million tons of cargo were transported on this route in 2019, a marked increase over the previous year (+56.7%); this data is expected to increase in the coming decades. In recent years, trips have typically only been possible between July and November, when sea ice is melted or thinner. Nevertheless, in June 2020, Russian LNG company, Novatek - which operates the Yamal LNG plan, managed to bring its ship Christophe de Margerie in the Arctic Ocean in the winter season from Russia to China in twelve days. Escorted by a nuclear icebreaker, the LNG ship covered more than 2,500 nautical miles when ice is expected to be thick, thus impeding navigation. This journey was a test to see how far the NSR route can go and evaluate its handle capacity. According to recent studies, the trade volume between Asia and Europe is destined to grow by 40% until 2030 and 100% until 2050 (compared to the 2006 index). A more considerable volume implies that multinational logistics companies may be interested in investing in container ships with greater tonnage. This is why the Suez Canal is often the subject of works to expand its capacity. The result is a knock-on effect. Agility, adaptability, and flexibility are the main characteristics that attract giants such as China's Cosco, Japan's Mol, and Denmark's Maersk to the Northern Sea Route. The opportunity to boost the economy of the northern regions through this new route has not escaped the government in Moscow. President Vladimir Putin referred to the Northern Sea Route as the "key to the development of the Russian Arctic and Far East" of the Federation. By 2025, the goal is to increase traffic 10-fold to 80 million tons per year.[124]

The Northeast Passage (NEP) extends the Northern Sea Route along the North European countries connecting the Pacific Ocean to the Northern Atlantic Ocean. The Northeast passage, opened by melting Arctic ice, makes it possible to connect Hamburg to Yokohama while saving 3,700 nautical miles. It is crucial to underline how the two routes, the Northern Sea Route and the Northeast passage are totally different in legal terms; indeed, the NEP is under the international jurisdiction. Therefore, international law, treaties and littoral states legislation complying international law, regulate the passage. Conversely, the NSR is a Russian maritime route under Russian jurisdiction. In Russian legislation, the Northern Sea Route is described as "the national unified transport line of communication of the Russian Federation in the Arctic, including the Vilkitskii, Shokalskiy, Dmitry

[124] Business Index North, *Maritime Traffic And Transportation Infrastructure Along The Northern Sea Route*, 2019.

Laptev and Sannikov strait."[125] Navigating on these waterways must be conducted following provisions laid down in Federal Russian law.

Northwest passage

The NWP is defined as combining shipping lanes connecting the Atlantic Ocean with the Pacific Ocean through the North American Arctic waterways. It passes through the Davies Strait, Baffin Bay, and the Canadian Arctic Archipelago to the Beaufort Sea. This then leads to the Chukchi Sea, finally opening up to the Pacific Ocean through the Behring Strait.[126] Like the NSR, there is no single channel set for vessels to follow. The channel used is based on which one offers the best sea ice conditions at any given time and place. Therefore, the NWP is like the NEP / NSR, a transport corridor through a vast archipelago to open waters. The route is usually considered an alternative to the Suez Canal and the Panama Canal, reducing travel days and costs. The calculations demonstrate how the distance between North-western Europe and Asia is expected to be reduced by 30% and the distance between East Coast USA and East Asia by 20%.[127] Similar to the NSR, this route is characterized by several different passages and minor routes because of the presence of 36.000 islands creating straits and waterways. There routes follow two main paths: the northern one through Parry Channel, or Southern trough Victoria Island. The former is relatively deep, allowing large-sized vessels to navigate. The southern route is highly shallow, and only less than 10 meters of draft vessels can access. It is essential to underline how the ice condition in the Canadian Arctic is usually more drastic than along the NSR. Moreover, the straits remain frozen for a more extended period. Shipping in the Canadian Arctic is governed by the Canadian Coast Guard (CCG), which monitors vessel movements and provides radio services.[128] Importantly ice and weather information are provided for vessels operating along the NWP through the NORDREG system.[129] The CCG has divided the Canadian Arctic into various zones, where navigation is allowed depending on sufficient ice strengthening capabilities. Compared to the Russian Arctic, the areas along the NWP are significantly underdeveloped – especially around the waterways of the Canadian Arctic. The largest and only well-developed port in the Canadian Arctic is Churchill, located in Hudson Bay, close to the interior of the North American continent.[130] The Hudson Bay shipping season lasts from mid-July to the beginning of November, but the season

[125] Federal act of the internal sea waters, territorial sea and contiguous zone of the Russian Federation. 17 July 1998 Article 15
[126] Hansen, Carsten Ørts, Peter Grønsedt, Christian Lindstrøm Graverse, and Christian Hendriksen. *Arctic Shipping: Commercial Opportunities And Challenges*. Frederiksberg: CBS Maritime, 2016.
[127] Ibidem
[128] Ibidem
[129] Vessels planning to transit through Canadian territorial waters or enter Canadian waters inbound to a Canadian port within the Canadian Arctic Zone shall send pre-arrival information to NORDREG Canada
[130] Hansen, Carsten Ørts, Peter Grønsedt, Christian Lindstrøm Graverse, and Christian Hendriksen. *Arctic Shipping: Commercial Opportunities And Challenges*. Frederiksberg: CBS Maritime, 2016.

could be lengthened significantly with icebreaker support. In order to be fully operational, the route would need to develop adequate ports and infrastructure to host ships and the increasing amount of traffic that it is predicted along the route. For the most of the year, the NWP is covered by sea ice which makes an obstacle for both navigation and icebreakers and a danger for less capable ships.[131] The ice condition in the NWP archipelago continuously varies from year to year, presenting unpredictability to any surface operation. Consequently, the NWP will be mainly controlled by the ice condition; indeed, it is the route where ice melts the less and the ice is particularly thick in four choke points. The Canadian Ice Service affirmed how it is pretty likely that the latter half of this century will still experience occasional summers with ice conditions as severe as those witnessed in the 1980s. Consequently, multi-years ice will be the major risk for ships crossing the route. Indeed, "the oldest and thickest ice in the Arctic Ocean is usually driven against the western flank of the Canadian Archipelago. As long as this remains a source of multi-year ice in the Arctic Ocean, it will continue to drift through the Canadian Archipelago." [132] Ice conditions are expected to change more rapidly in Russia's Northern Sea Route than in Canadian. In the future, the passage will probably not be a serious competitor to other routes and passages that area opening up in the region. For what concerns the governance of the passage, Canada claims full control and jurisdiction over the archipelagic part of the routes; indeed in 1986, Canada declared the passage as part of Canadian internal waters. As previously analyzed, the US and the EU claimed against this position since they consider it illegal. According to the US government, the Northwest passage is an international strait opened to international navigation based on *transito in transito* principle, without coastal state's interference. Therefore, Canada and Russia are dealing with the same political and legal opposition regarding the Arctic passages.

Transpolar sea route

The Transpolar Sea Route is the most direct route that links the Bering Strait and the Atlantic Ocean, passing through the central part of the Arctic, and it is the shortest among the Arctic routes. Unlike the NSR and the NWP, the Transpolar Passage (TSR) is outside any state's jurisdiction and is located in international waters. These waters include the High Sea, where the freedom of navigation applies. This rationale includes the Arctic Basin and all the ocean areas beyond the territorial sea and within 200 nautical miles of the EEZ. In the former, the coastal states have no jurisdiction apart from the flag state jurisdiction they exercise over crews and ships. An overlap characterizes the second sea

[131] Haas, Christian, and Stephen E. L. Howell. "Ice Thickness In The Northwest Passage". *Geophysical Research Letters* 42, no. 18 (2015): 7673-7680. doi:10.1002/2015gl065704.
[132] Willy Østreng, "ARCTIS | The Northwest Passage 2", Arctis-Search.Com, 2010, http://www.arctis-search.com/The+Northwest+Passage+2.

portion among coastal and non-coastal states' rights and duties. In this portion of the sea, a belt of 188 nautical miles, the coastal states have specific rights for resources' exploitation, conservation, and management. Consequently, the TSR is governed by international law and treaties such as UNCLOS Convention, SOLAS, and MARPOL Conventions. The IMO Polar Code is applied in all the routes, but since in this specific case no national jurisdiction is applied, it is crucial to transform IMO's principles into binding rules. Considering the lack of national jurisdiction, good corporate governance and corporate social responsibility become essential in managing the route. The international rules are only binding for state parties, not for private enterprises. Therefore, it becomes important that the relevant treaties and conventions bind flag states with registered ships operating in the Arctic.[133]

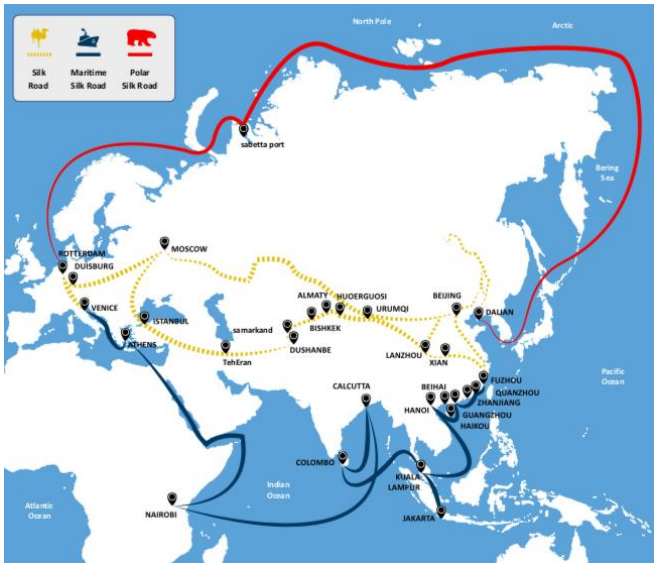
The primary peculiarity of the TSR is that it is not characterized by draft limitations, complex archipelago, or narrow straits that make the navigation more complicated; however, the ice extension of the sea is the element that poses some constraints on the future Arctic navigation along this route. The DNVs Arctic Container Project (ARCON) simulations analyses how, in the following years, the ice will be too thick and largely present in the area; consequently, the costs would still be too high to begin regular transport across the routes.[134] Some models present how that ice condition along the TSR will continue to be heavy both in winter and spring. They also predict how probably, by summer 2050, the route is not supposed to be free of ice. Because of climate uncertainty in the northeast of, the route does not follow one specific track but presents various routes that it can cross. Regular transports are still hard to be planned. Indeed, not cargo ships have ever crossed the route; the only ships that have passed it were icebreakers. It would probably take further 10-20 years to have the possibility of opening the TSR.[135]

4.1.1 Polar Silk Road

"The dependence on foreign trade has caused China to seek diversification of trading routes to Europe in high political instability along established shipping lanes."[136] In June 2017, president Xi Jinping incorporated the Arctic in the Belt and Road initiative as one of the blue economic passages to link Asia to Europe for world trade. The BRI is composed of three main routes: the sea route "One Road"

[133] Willy Østreng et al., "Shipping In Arctic Waters", 2013, 269, doi:10.1007/978-3-642-16790-4.
[134] Frédéric Lasserre, "Simulations Of Shipping Along Arctic Routes: Comparison, Analysis And Economic Perspectives", Polar Record 51, no. 3 (2014): 239-259, doi:10.1017/s0032247413000958.
[135] Arnfinn Jørgensen- Dahl, "ARCTIS | The Trans Polar Passage", *Arctis-Search.Com*, 2010, http://www.arctis-search.com/The+Trans+Polar+Passage&structure=Arctic+Sea+Routes.
[136] Carsten Ørts Hansen et al., *Arctic Shipping: Commercial Opportunities And Challenges* (Frederiksberg: CBS Maritime, 2016).

that passes through the Suez Canal, the land route “One Belt” crossing central and western Asia and Russia to arrive in western Europe, and finally, the Arctic route.



SRM on China’s Development and Reform Commission, The Arctic Institute, National Snow and Ice data Centre, Reuters, 2020

https://www.assoporti.it/media/6847/arctic-route-2020-isp-srm.pdf

China, complicit in global warming, which now frees the Arctic free from ice for part of the year, dreams of opening a new trade route to European markets, called the “Polar Silk Route” (PSR). The Chinese interests in the region are not surprising since the country has been active for years in the region thanks to investments, research activities, and its role as an observer in the Arctic Council. The Northern Sea Route along the Russian Arctic is the most promising Arctic route to develop the, PSR and consequently, Chinese investors have started to cooperate with Russian companies. As previously analyzed, the Chinese cooperation with Russia primary included the energy and gas sectors. Therefore, the new venture will ship liquefied natural gas (LNG) from the giant Yamal LNG site in Siberia to a list of destinations that includes Northern Europe, Japan, South Korea, and China. The venture will kick off with a fleet of a dozen icebreaker tankers, with Cosco’s China Shipping LNG Investment Co. operating nine additional tankers.

Moreover, Russia has a long-lasting experience in Arctic navigation and, in the coming decades, ships of any flag will depend on Russian icebreakers to escort them; Russia owns more than forty icebreakers while China only two. China is investing a massive amount of money not only in Russia but in Finland, Norway, and Greenland too; the aims is to develop a significant economic presence in the region, becoming an essential partner for the Nordic countries and exploit mineral, oil, and gas

deposits present in the subsoil of the area. Moreover, China aims to develop hubs and infrastructures across the Arctic to support the PSR development. A further driving factor for developing the PSR is the constant dependence on the Malacca strait; the awareness that most of China's trade, including 80% of its imported oil, could be curtailed at short notice if the US Navy blocked the strait, prompted the search for alternative shipping lanes.

It is important to underline how, despite the immediate attention toward the NSR, the choice of the routes to travel will be influenced by the types of goods transported, by the ice conditions, and by the routes' jurisdiction. Indeed, Beijing is negotiating with international organizations to obtain free passage in the waters of the NSR that fall under the Russian legal system. China has to deal with different issues with the eight Arctic states and respect international conventions that apply both in the Arctic and territorial disputes. The Chinese polar route will be developed as a double-arrow: it will be exploited not only for export but also for import; China is interested in importing raw materials, especially gas from the north of Russia, while implementing its exports toward Europe, diverting its vessels from the Indian to the Arctic Ocean. "The route would be starting from Dalian and would cover the whole Pacific Ocean to the Arctic Ocean to meet Rotterdam in The Netherlands."[137] In the past years, the Polar Silk Route was considered impractical because of the Arctic ice sheet, but nowadays is becoming increasingly realizable because of global warming and its effects. Already in 2010, four Chinese cargo ships transited in the northern Arctic, preceded by icebreakers. In 2017 the Chinese ships were 46 carrying 1.26 million tons of goods. Some obstacles are hampering the Chinese project in the short term: the erratic flow of goods and the impossibility of crossing the seas during winter due to ice thickness, especially between Canada and Greenland that represent the significant constraints. Forecasts suggest that it will not be until around 2040-2045, as the melting of the ice sheet progresses, that this route can be taken without using icebreakers. The main idea of China is to increase its trade plan and implement shipping from Asia to Europe. However, China frames this Polar Silk Road in a broad concept of international cooperation in order to ensure a shared benefit among the Arctic and non-Arctic states. The PRC's president affirmed how the BRI would allow save at least one week, roughly 40% if China would avoid the shipping routes across Panama and Suez Canal. China mentioned optimizing logistic costs, the increase of speed of transporting cargo to consumers around the world and EU's tariff and taxes as the main drivers to deviate its traditional shipping routes to the Arctic. Some of the components of the PSR, first

[137] Tulika Tandon, "All About China's Polar Silk Road In The Arctic Ocean: Significance, Prospects And Challenges", *Jagranjosh.Com*, 2021, https://www.jagranjosh.com/general-knowledge/chinas-polar-silk-road-in-the-arctic-ocean-significance-prospects-and-challenges-explained-1615195369-1.

announced in 2013, are already operational as China seeks to alleviate the financial and logistical challenges of transporting loads of fuel and cargo from potential Arctic states via the Northern Route.

4.2 Arctic routes and Suez Canal comparison

The opening of the Arctic routes is presenting substantial advantages for world trade. Several elements and factors make these routes attractive for countries and companies; these are increasing the attention toward the north with a future idea of moving part of the world to alternative paths. Meanwhile, additional elements leave some open questions about the effectiveness and the substantial advantage of using these routes. In the following pages, two of the most important routes are analyzed and compared to the most used commercial route to connect Europe and Asia, the Suez Canal: Hamburg-Yokohama via NSR and Hamburg-Shanghai via NWP and TSR. Different parameters are considered while assessing the choice of traveling along the Arctic Routes or via the Suez Canal: the distance, the total fuel consumption, the travel days, the insurance costs, the fuel costs, and any possible fees.

Hamburg-Yokohama: NSR vs Suez Canal

This is one of the most significant routes that connects Europe to Asia. Nowadays, the primary route passes through the Suez Canal, but essential considerations can be developed on the possibility of connecting the two continents thanks to the NSR. "The NSR is currently the most attractive of the three major routes' choices because of the favorable ice conditions, location, and ice-breaker support from the Russian NSR administration."[138] Therefore, a more specific and detailed analysis will be dedicated to this route. It is important to underline how the specific distance will depend on which route is taken through the NSR since, as previously mentioned, there are several internal routes within the main one. The table below shows the difference in navigational distance from Hamburg, Germany, to Yokohama, Japan. The calculation is made on the same speed of 15 knots for both routes. It emerges that a reduction in the distance of 4200 nm and 14 travel days occur if using the NSR. Consequently, traveling on the NSR reduces travel distance of 36% and travel times by 44%, with 14 days less than the Southern Sea Route (SSR) through the Suez Canal. In addition, the table shows how, if reducing the speed of the ships crossing the NSR, the days at sea remain the same; this implies a significant reduction in CO_2 emissions and fuels consumptions. Fuel consumption for propulsion per day is directly proportional to the cube of the speed; the fuel consumption per distance unit is

[138] Nathanael Melia, Keith Haines and Ed Hawkins, *Future Of The Sea: Implications From Opening Arctic Sea Routes* (Foresight, Government Office for Science, 2017).

directly proportional to the squares of the speed. CO_2 emissions are directly proportional to the amount of fuel consumed. This entails that the daily fuel consumption at 9 knots is theoretically 22% of the consumption at 15 knots. This implies a strong reduction of costs and oil consumption for ships and vessels and reduces GHG emissions, making the route more attractive.[139]

	From Hamburg to Yokohama	**Equal Speed - Corresponding days at sea**	**Days at sea - Corresponding speed**
Via Suez	11400 nm	15 knots 32 days	32 days 15 knots
Via NSR	7200 nm	15 knots 18 days	32 days 9 knots

Journal of Transport Geography, 2011

https://doi.org/10.1016/j.jtrangeo.2011.03.003

The study of Schøyen and Bråthen "The Northern Sea Route versus the Suez Canal: cases from bulk shipping" underlines how an equal number of days at sea entails that several logistics attributes will be identical for the two route choices, making conceptual exploration easier to conduct:

- As transit times for deep-sea steaming are identical, cargo inventory costs may also be assumed to be identical.
- Ship fuel consumption other than for propulsion is more or less the same.
- Port loading and discharging time are the same, for the same vessel type and size.
- Vessel positioning and timing for possible backhaul cargo is similar.[140]

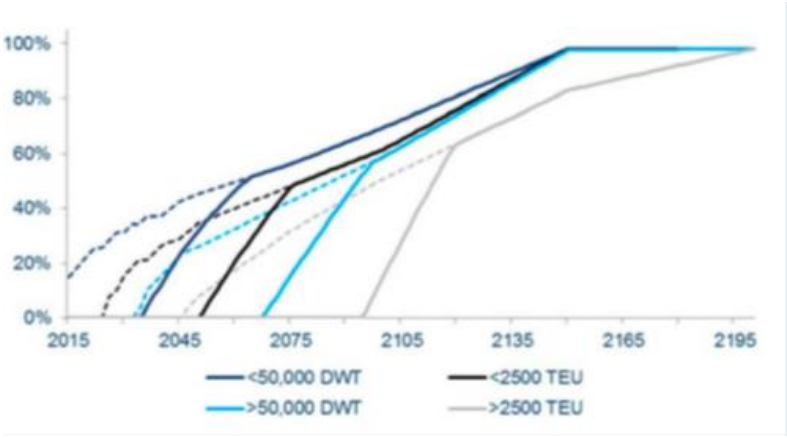
A further significant advantage in using the NSR will be the drastic reduction in the ports of call; a containership via the Suez makes roughly eleven port calls in total, while via the NSR makes eight

[139] Halvor Schøyen and Svein Bråthen, "The Northern Sea Route Versus The Suez Canal: Cases From Bulk Shipping", *Journal Of Transport Geography* 19, no. 4 (2011): 977-983, doi:10.1016/j.jtrangeo.2011.03.003.
[140] Ibidem

port calls. Differently, tankers call only call origin and destination ports trough the routes.[141] This reduces the cost that ships need to pay to ports for each of their stops; indeed, port-related charges comprise various fees levied against the vessel and or cargo to use of the facilities and services provided by the port.[142] The development of the NSR will significantly impact regional Arctic developments; therefore, Scandinavian countries are seeing business opportunities in the opening of these routes that include development infrastructure, tourism, and commercial agreements. Russian ports will increase their handle of tons of cargo with an increase in the NLG and oil products, while specifically Murmansk and Arkhangelsk will position themselves as container ports for transit shipping. Finally, passing through the NSR reduces the level of piracy and the risks that ships be attacked. This phenomenon is not particularly accentuated in the Strait of Malacca, but it a severe threat in the Gulf of Aden, in the Indian Ocean. Østreng and al in their book "Shipping in Arctic Water", analyzed how the NSR is more attractive in terms of fuel costs saving; indeed, a savings of roughly $160.300 per trip occur. The study has been conducted considering low sulphury heavy fuel price in Hamburg at $465 per ton. The study analyses how the average fuel consumption in tons for a single journey through the Suez Canal is 838 while a trip through the NSR consumes 479 tons of fuel. At the price of $465 per ton, the total costs for the Suez Canal route would be 389,670$; through the NSR it would be 222.735$. The NSR results thus more attractive in cost savings compared to the traditional route that passes through Suez. A crucial factor in the increasing attraction toward the NSR lies in ensuring environmental sustainability and promoting environmental security thanks to a vital reduction of carbon dioxide (CO_2) emissions. Here, fuel consumption costs' reduction is roughly 60%, but it will obviously depend on the bunker oil price and its variation in the coming decades. The reduction in bunker consumption will also reduce emissions of CO_2. "More use of Arctic passages would, *ceteris paribus*, contribute to more sustainable transport."[143] Sea transportation emits 1 billion tons of CO_2 annually, which makes nearly 3 percent of the total global emissions, and the Arctic emission of CO_2 from shipping appears as about 1 percent in 2004. The NSR presents itself as a more environmentally friendly sailing route connecting Asia and Europe than the Suez Canal. Schøyen and Bråthen analyzed how a vessel between Northern Norway and Northern China via the NSR reduces about 3 270 metric tons of CO_2 emissions compared to the shipping via the Suez Canal. They argued that the emission saving potential of the NSR is even higher for the vessels using LNG

[141] Yiru Zhang, Qiang Meng and Szu Hui Ng, "Shipping Efficiency Comparison Between Northern Sea Route And The Conventional Asia-Europe Shipping Route Via Suez Canal", *Journal Of Transport Geography* 57 (2016): 246, doi: 10.1016/j.jtrangeo.2016.09.008.
[142] Ibidem
[143] Willy Østreng et al., *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*, Arctic Yearbook (Chichester, UK: Praxis Publishing, 2013).

fuel.[144] In addition, Schøyen and Bråthen analyzed the economic potential of bulk cargo of iron ore and nitrogen fertilizers through Arctic shipping. They compared the CO_2 emissions from the bulk carriers navigating between Europe and Far East Asia through the NSR and Suez Canal. From the study emerges that the NSR is 100% energy efficient and the Suez Canal only 22%. The NSR CO_2 emissions were roughly 623 metric tons and 3893 metric tons for sailing through Suez Canal. The per metric ton shipping cost of iron ore was calculated 39 and 37 US dollars for the shipping via the Suez Canal and NSR, respectively. The study demonstrated that the reduced number of sailing days, fuel cost savings and lower CO_2 emissions are the main advantages of sailing through the Northern Sea Route compared to the Suez Canal. It is important to underline how the profitability of the shipping also strongly depends on the kind of ships that cross the route. The graph represents the future trend in the Arctic shipping NSR according to the ships' size.



International Transport Forum, 2019

https://www.itf-oecd.org/sites/default/files/docs/commercial-shipping-northern-sea-route.pdf

The dotted lines represent the navigability window, while the continuous lines represent the actual utilization. The y-axes represent the percentage of ships that invest in ice-strengthening and choose the NSR over the Suez Canal. The x-axes represent the year in which the operations and activities on the NSR will become profitable. When the lines reach 100% means that that specific ship category will reach year-round navigation. Low cargo size (<2.500 TEU and < 50.000 DWT) [145] are less heavy and have more possibility of maneuver in waters with a small draft such as the NSR ones. According to the graph, these kinds of cargos will become profitable around 2035 for non-container ships and

[144] Halvor Schøyen and Svein Bråthen, "The Northern Sea Route Versus The Suez Canal: Cases From Bulk Shipping", *Journal Of Transport Geography* 19, no. 4 (2011): 977-983, doi: 10.1016/j.jtrangeo.2011.03.003.
[145] Twenty-foot equivalenti (TEU) unit is a unit of cargo capacity used for container ships. Deadweight tons (DWT) is the amount in tons that a vessel can carry.

around 2051 for container ships under a business-as-usual scenario, therefore, with a high rate of ice thawing. Its difference is driven by the tight time schedules in the business model of container ships, which are modeled to only take the NSR when limited assistance is required, and navigability conditions are less uncertain. Conversely, more oversized (>2.500 TEU and >50.00 DWT) will increase their profits along the route roughly 2068 for non-container and in 2095 for containers. In order to get access to the NSR, the shipowner has to submit an application to the NSR's Administration with four months of advance if an additional fee is paid, this time may be reduced to one month. The application document must contain all the vessel's information such as the ownership, the crew, technical specification, etc. After the Administration has obtained preliminary approval, a representative of the Marine Operations Headquarters (MOH) must inspect the ship for ice navigation worthiness. When the inspection is completed and approved by the MOH, the specific route is set up, the day of departure set, and icebreakers and pilotage support is provided. The NSR's system finances different services to open fairways to traffic and to protect and safeguard the environment. The services include icebreaker support, satellite communications, and meteorological information. There is not an average fee, and usually, it is calculated on different factors: the size of ships (larger ships have lower fees per ton), ice-class of ships, type of ship/cargo, ice conditions that determine whether icebreaker assistance is required, the expertise of captain and crew and the specific route to travel. The table below indicates the 2019 costs per TEU per day at sea for container ships, according to capacity in order to give an average of the costs. It is evident how the increasing TEU allows ships to pay less USD, creating significant advantages for bigger ships' companies.

Total shipping capacity (TEU)	Price per TEU (USD)
12 500	12.43
18 000	10.99
22 000	10.04
24 000	9.57

ABB.com, 2019

https://www.itf-oecd.org/sites/default/files/docs/commercial-shipping-northern-sea-route.pdf

Hamburg - Shanghai: NWP and TPR vs Suez Canal

A further significant route to be considered of Arctic shipping is the route that connects Hamburg, Germany, to Shanghai in China. As described earlier, there are seven different routes to choose

through the NWP, and the total distance will vary with the actual choices. Since this analysis aims to get a feeling for the overall proportions, any exact route will be considered.[146] The first difference is the nautical miles that characterized the travel through Suez Canal and the Northwest Passage. The former is roughly 10523 nm, while the NWP is 8,581 nm with a significant reduction of 18,5% in the distance to travel.[147] A further crucial element strictly connected to reducing nautical miles is the reduced consumption of total fuel for each journey. Indeed, the total fuel consumption along the Suez Canal is roughly 3275 tons, while along the NWP is 1994 tons. Considering the fuel prize established by the study of Østreng et al. of 465$ per tons, there would be a saving of about 595,500$ for each journey, with a reduction of 39%. Travel days reduction is not as significant as the NSR since roughly one day is saved. A crucial element that characterized the NWP is the lack of a fee system for its passage; therefore, it is considered unlikely that the Canadian government will impose some fees on the icebreakers due to the already difficult and expensive passage across the route. The risk is to discourage the economic viability for any transportation on the passage. Conversely, the Suez Canal toll for the passage amounts to roughly 135.145$.[148] It must be said that the North-West passage compared to the North-East passage presents some questions, the route is not as linear, a greater persistence of ice is expected and there is greater risk of political instability.

In the same way, the TPR would significantly reduce the nm distance among the two cities; indeed, the TPR distance is 7100 nm compared to the already mentioned 10,523 reducing the distance by 30%. The travel days along the TPR are 17 while along the Suez Canal are 20; this allows ships to make more return trips within a given time resulting in increased revenue and potentially more significant profits.[149] It implies that along these routes, there would be a significant possibility of fuel costs savings of 761,800$ since the fuel consumption of the TPR would be 1637 tons compared to the 3275 tons of Suez. Consequently, the fuel consumption reduction when using the TPR is about 50%. Due to the shorter length of the TSR, a ship going from the Far East to Northwest Europe (Rotterdam or Hamburg) can reduce its speed by roughly 40% and still arrive in Japan simultaneously as a ship sailing at full speed traveling through the Suez Canal.[150] This has also been shown by the NSR since the reduction of nm gives the ship a significant advantage. Moreover, Schøyen & Bråthen

[146] Tor Wergeland, "ARCTIS | Arctic Shipping Routes - Cost Comparisons With Suez", Arctis-Search.Com, 2010, http://www.arctis-search.com/Arctic+Shipping+Routes+-+Cost+Comparisons+with+Suez.
[147] Hansen, Carsten Ørts, Peter Grønsedt, Christian Lindstrøm Graverse, and Christian Hendriksen. *Arctic Shipping: Commercial Opportunities And Challenges*. Frederiksberg: CBS Maritime, 2016.
[148] Willy Østreng et al., *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*, Arctic Yearbook (Chichester, UK: Praxis Publishing, 2013).
[149] Malte Humpert and Andreas Raspotnik, "The Future Of Arctic Shipping Along The Transpolar Sea Route", in *Arctic Yearbook 2012* (Northern Research Forum and the University of the Arctic Thematic Network (TN) on Geopolitics and Security, 2012), 291.
[150] Malte Humpert and Andreas Raspotnik, "The Future Of Arctic Shipping | The Arctic Institute", The Arctic Institute, 2021, https://www.thearcticinstitute.org/future-arctic-shipping/.

indicates how slow sailing may more than double a vessel's energy efficiency performance significantly reduce greenhouse-gas emissions. In the light of growing awareness about climate change emissions several major shipping lines, e.g. Maersk, adopted slow sailing, lowering speeds from the standard of 25 knots to around 12 knots. A further advantage of the TPR is the possibility of crossing international waters that are not subjected to any states' jurisdiction, especially Russia's with its red tape and tariffs. Nevertheless, it is crucial to underline how among the three routes, this is the less likely to be free of ice because of its highest latitudes, and therefore icebreaker support will be required.

4.3 Arctic routes' disadvantages

Despite the significant positive advantages of reducing costs, travel days, and CO_2 emissions, it is essential to consider the doubts and possible disadvantages of opening the Arctic routes. The weather uncertainty is one of the primary doubts of these routes; the forecasts predict that the region will be free of ice by summer 2030, but a limited length of the navigability and continuous changes in the climate pattern do not always allow a precise shipping plan. Moreover, the navigation may be characterized by uncharted waters with dangerous icebergs along with remote parts of the coastline. Progress is slower and less predictable as ice must be avoided or broken, making the route unsuitable for time-constrained expeditions. Therefore, the coastal sea is particularly shallow; therefore, ships with shallow drafts must be used to reduce the tonnages and the cargo's capacities. Finally, for the foreseeable future, "ice-class" ships must be used with stronger hulls and more powerful engines. A recent study estimates that ice-class ships are 10 to 35 percent more expensive to operate. New icebreaker cargo ships reduce the need for an escort, but they are pretty expensive. LNG carriers traveling from Yamal to China cost $320 million each, about 75% more than a standard LNG carrier of similar capacity. Moreover, it is necessary to consider the high insurance costs and maintenance that the ships crossing the Arctic routes require. Indeed, the insurance rate and annexed costs are expected to be 50-200% higher than through the traditional route of the Suez Canal. Indeed, the insurance companies have several risks perception about Arctic shipping: harsh weather conditions, restricted visibility and fog, the high costs connected to oil pollution clean-up, vessels' collisions, and lack of detailed charts to support navigation. The insurance companies would eventually set high costs to protect ships since they do not own enough information to understand sea ice risks for Arctic operations fully. The physical risks to operators and the environmental risks will lead to more significant liability risks (and therefore potential liability costs), including marine pollution and third-

party damages.[151] It is not ships' damaging the most considerable financial risk in the Arctic, it is the cost for mobilizing a salvage operation of search and rescue (including wreck removal) and possible pollution clean-up at those latitudes. Even though insurers well know several risks associated with shipping, there are still risks related to Arctic navigation that needs to be identified. Underwriters typically base their underwriting premiums on statistics, and the frequency of accidents is a critical element evaluating risk when navigating in Arctic waters. Knowledge of accident rates can help determine insurance rates.[152] The international insurance market is willing and able to underwrite risks in terms of shipping on the three Arctic transport corridors, but to a very different price. Based on the risk factors, the insurance premium will likely be higher for the NWP and TPR than for the NSR since it is the most likely route to be opened and the ones that will be free of ice much before the others. In addition, the crew members that will be present on Arctic routes need to be specifically trained in order to be capable of navigating ice-sea; this implies a consequent increasing cost for shipping companies that need to prepare and train their personnel. In addition, the NSR Guidelines require an inspection of every crew member and ice navigator before they can enter the NSR. These controls are conducted by the Marine Operations Headquarters (MOH) on both sides of the NSR. Moreover, the crew's size is crucial: it must be large enough to guarantee a three-shift watch. Indeed, the Polar Code contains the Polar Water Operations Manual (PWOM) regarding the ship's operational capabilities and limitations in order to support the decision-making process in polar waters. "The PWOM considers the potential lack of ship crew experience in polar operations, with the potential for human error, as a potential hazard that may lead to elevated levels of risk due to increased probability of occurrence, more severe consequences, or both".[153] The Polar Code under the chapter concerning the survival affirms that "the crew shall be trained in the use of the personal survival equipment and group survival equipment" and "every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties."[154] A crucial element to consider is the possible necessity of icebreaker support, able to break through layers of ice. The average cost for the most potent icebreakers amounts to $1bn and it takes 8–10 years to be built. Hiring charges vary, but the average cost for escort through the Northern Sea route is around $200,000.[155] It is essential to remember and underline the potential environmental impact that navigation across the Arctic may cause. There would be indeed a significant reduction in CO_2 emission and GHG, but other elements will affect the region. Therefore, it is necessary to study

[151] Bjorn Gunnarsson, "Assessment Of Maeitime Insurance On The NSR", (Speech, Oslo, 2015).
[152] Willy Østreng et al., *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*, Arctic Yearbook (Chichester, UK: Praxis Publishing, 2013).
[153] "Polar Water Information Manual", in International Code For Ships Operating In Polar Waters, 2021, 7.
[154] International Code for Ships Operating in Polar Waters (Polar Code), Manning and Training, Art. 12.1.1, 2020
[155] Arctic Opening: Opportunity And Risk In The High North (London: Lloyd's, 2012).

and prevent potential consequences far before the routes would be free of ice. The melting of the ice creates a direct consequence increased accessibility of ships in the Arctic space, with a consequent increase in air pollution from activities such as oil and gas extraction in the region or maritime transport. Science is studying the possible environmental damage of the area. Also, worth mentioning is that most of the fuel consumed by ships operating in the Arctic (57%) is Heavy Fuel Oil (HFO). The combustion of HFO creates particulate matter (including black carbon) known to increase the rate of melting of Arctic sea ice. Striking a balance between the potential offered by a warmer Arctic and the risks this poses (such as oil spills and environmental impacts) is a significant challenge that the Arctic and non-Arctic states must research. Some possible measures in order to reduce the shipping environmental impact have been presented, such as cut shipping emissions of black carbon, which absorbs heat from the sun and is one of the leading causes of ice melting in the region; ban the use by shipping of heavy fuel oil in Arctic waters, as has already been implemented in the Antarctic.[156] "This oil produces more toxic air pollutants and, in the case of an oil spill would have catastrophic effects on ecosystems; require ships to operate at slower speeds. Such a measure would minimize the risk of accidents and bring safety and environmental benefits."[157] As the Arctic ice sheet retreats, shipping, human and industrial activities in the area will increase over the next 30 years, the Arctic will be more attractive to global interests than today. The increase of human activity in the Arctic in the following decades will also bring large investments in infrastructure with the growth of air, and marine pollutant emissions, the overall noise caused by transport will increase. The environmental impact on this fragile ecosystem in the coming decades is a question that the international community will have to address in advance, avoiding environmentally devastating effects on marine wildlife and the entire ecosystem.

4.4 Future of Arctic shipping

The global maritime industry will decide whether the Arctic routes will officially complement the reliable Suez Canal route. As analyzed, different positive and negative factors will contribute to the official decision. However, the growing interests of Arctic states, the new Chinese Polar Silk Route, and the recent Suez Canal obstruction occurred in March 2021,[158] prefigure a prevalence of Arctic shipping advantages over disadvantages. The Arctic Marine Shipping Assessment has affirmed that

[156] Willy Østreng et al., *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*, Arctic Yearbook (Chichester, UK: Praxis Publishing, 2013).
[157] *Troubled Waters. How To Protect The Arctic From The Growing Impact Of Shipping* (Brussels, Belgium: Soft Free and European Federation for Transport and Environment (T&E), 2012).
[158] On March 23, 2021, the Ever Given, a 400-meter-long Golden class container ship, ran aground in the Suez Canal, obstructing it. The ship had previously been hit by a sandstorm and pushed by strong winds of up to 74 kilometers per hour, causing it to go off course.

the first profitable modality of Arctic Shipping would be the destination modality, mainly connected to natural resources demand and regional trade. "Indeed, dry and wet bulk carriers follow less predictable schedules and their routes depend more on changing supply and demand of less time-sensitive items."[159] Subsequently, with a likely increase of ice thawing, the other different modalities will occur in the region. A great challenge would be to recognize the international nature of Arctic shipping and engage with various non-Arctic countries, decision-makers and stakeholders. This implies looking for a balance under UNCLOS for navigation rights with specific regimens and mechanisms to allow maritime safety and safeguard the Arctic maritime environment. If the ice thawing continues at this pace, marine access should improve throughout the Arctic basin. This would imply that icebreakers escort will not be necessary anymore with a significant reduction in estimated costs. Extended marine operations will require greatly expanded search and rescue cooperation and expanded regional environmental response networks. Information and data sharing will also be key to the future of the maritime Arctic.[160] Despite the disadvantages, the northern countries are getting ready to host increase traffic along their coasts. Indeed, Russian, Chinese and Finnish shipyards are building ships able to navigate without the expensive icebreakers escort. The Russian company Sovcomflot has in the Sud Korean pipeline fifteen tankers for liquid natural gas transport, able to navigate also in winter. Moreover, Novatek is building in the far east, in Kamchatka, a logistic terminal for the reloading the LNG transshipment from ice-class ships to the conventional one's recipient, to Asian markets. There are three main issues the Arctic States would have to deal with: globalization of the Arctic due to natural resources exploitation with a consequent increase of destination marine traffic; take advantage of the opening of the Arctic routes for economic security and development while keeping in mind and focusing on the environmental security of the region; finally, keep engaging with non-Arctic states and international institution such as IMO in order to shape together the future of Arctic maritime activities. What is happening in the Arctic seas is the beginning of a clash among shipping giants in order to assume increasing relevance on the routes. The companies aim is to be at the forefront of the routes' development, hoping to control increasing market share. One of the most relevant giants is the China Ocean Shipping Company (Cosco). The Chinese goal is to develop LNG transport from Siberia, since Moscow and Beijing have highly significant agreements in the energy sector. Nevertheless, recent developments by Teekay and Japan's Mitsui O.S.K. lines should not be underestimated either. The partial shift of maritime commerce toward the Arctic routes would further encourage China's ambitions of monopolistic

[159] Malte Humpert and Andreas Raspotnik, The Arctic Institute, 2012, https://www.thearcticinstitute.org/future-arctic-shipping/#:~:text=During%20the%20winter%20and%20spring,drift%20acros

[160] Willy Østreng et al., *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*, Arctic Yearbook (Chichester, UK: Praxis Publishing, 2013).

control over traffic and therefore over world trade by sea. The impression is that the challenge is still to prevent one of these companies, particularly Cosco, from gaining the upper hand by monopolizing a market that is still tiny but has infinite potential.

4.4.1 The impact on the Italian port's system

Global maritime transport is facing a new era due to the emerging Arctic shipping routes. As climate change increases and the ice-sea retreats, Arctic entrepreneurship becomes increasingly appealing. From the analyzed data, it emerges that the traditional route through the Suez Canal is not expected to lose its competitiveness in the short term but in the middle and long run. However, the ongoing changes and increasing attention toward the Arctic will significantly impact the maritime sector. For this reason, few years ago IMO release the Polar Code, the code that regulates the predicted increasing Arctic maritime traffic. Bearing in mind how economic developments are intertwined with the political field, it is inevitable that Arctic routes are dynamically coming to the forefront, making all the international actors vigilant over any regional change and mutation.[161] These growing prospects and expectations toward the Arctic routes and the Nordic shipping raise some questions about the actual routes of transport and their future.

The Mediterranean Sea covers a strategic role in the maritime shipping sector; indeed, 20% of global shipping is located in its seas. On a geo-economic level, the Mediterranean interfaces the large Atlantic and northern European markets on one side and the Asian and African markets on the other. For these reasons, the centrality of the basin in international scenarios is a decisive factor in attracting public and private investments in the transport and logistics sector, which continue to grow despite certain critical social and political situations. The numerous Chinese investments and those of Turkey and the Emirates in the ports and maritime terminals of many Mediterranean countries indicate a clear interest in developing and strengthening transport routes. Moreover, it is a consolidated fact that the Mediterranean represents a privileged transit route for containerized traffic - it concentrates 27% of world liner services - and a significant area for short-range traffic in a north-south direction. The Suez Canal enlargement strongly contributed to the increasing shipping, and nowadays, it can accommodate large ships simultaneously in both directions. The Suez Canal confirms itself as a strategic hub for global merchant shipping traffic; 90% of international trade uses this major transit route. The growth of goods in transit recorded important values: in 2018, a double record was set regarding the number of ships (over 18 thousand, +3.6%) and cargo transported (983.4 million tons,

[161] John Karkazis, Evi Bexevani and Petros Siousiouras, "Arctic Routes' Impact On The Global Transport System", 2017, 1-3

+8.2%). Moreover, in the same year, the average size of the ships that crossed the Canal grew by 12% compared to 2014, thanks to its expansion. In the Mediterranean, on the Asia-Europe route, which is confirmed as one of the main axes of international cargo traffic, Italy occupies a privileged geographical position. In this context, the national port system recorded in 2018 an almost stable trend. The Italian ports as a whole handled a cargo traffic volume of approximately 491 million tons in 2017. The 2018 world ranking of the top 100 ports for container traffic by Alphaliner, located Genoa in 73rd place as the first among Italian ports of call, followed by Gioia Tauro in 80th. The percentage of transshipments in Genoa is around 13%. The port of call is therefore configured as a gateway port that has a hinterland behind it that embraces a potential market formed by the Po Valley, southeastern France, Switzerland, and southern Germany.

According to the studies, roughly by 2035, the Arctic routes could be open and operative, providing a shorter route of about ten days between China and the major ports of Northern Europe. Therefore, it is natural to wonder what will be the future of the Italian port system due to the opening of the Arctic routes. Even though it is clear that the full operability of the routes will occur in more than a decade, it is crucial to understand how the Italian ports' system will be economically impacted and how it can be prepared to deal with this future possibility. The Italian economy relies on a network of alliances and trade routes, historically centered on the Mediterranean Sea, increasingly shifting their interest northward. The risk is that the Mare Nostrum will be marginalized with a further penalization of Italy that, in the Shipping Connectivity Index, is only 20th, behind all the main northern countries, and behind Mediterranean countries such as France, Spain, and Morocco. The possibilities for Italy to become the great "central hub" of Beijing's geo-commercial infrastructure of the Belt and Road initiative risk being shattered by the unknowns and consequences that climate change brings to the world's geography. Indeed, Italy has been included in the big Chinese plan of the BRI, and it represents a strategic terminal junction in the project, one of the most important among the 65 countries involved. Indeed, together with Netherlands, it is one of the main entry points for Chinese goods into Europe. The geostrategic advantage of Italy as access to continental Europe increased after the substantial Chinese investments in the Piraeus port of Athens. Nevertheless, the aim of Chinese investments in Piraeus and some Italian ports is not to transport goods to Greece or Italy. Piraeus and Trieste are the gateways to the rest of the continent, to Northern Europe. If arriving at Rotterdam and Northern Europe will be cheaper and faster through the Arctic routes for China, Italy risks becoming irrelevant. Therefore, it is expected that the costs of the ice thawing will be paid by Mediterranean ports, in particular the Italian ones. Italy could be one of the most economically damaged nations losing a significant volume of Asian goods; they currently transit through Italian ports and, subsequently, they are distributed by rail to other Central European countries. On the

contrary, countries such as Canada and Russia will greatly benefit, as they exploit fishing and mining areas in their possession (Exclusive Economic Zones) that are currently inaccessible and increase trade volumes in their ports. Despite clear and specific data not being available yet, it is possible to discuss and analyzed possible predictions and scenarios for Italy. The Italian ports will have to deal with a significant deviation of maritime shipping from the east to the northern routes, diminishing the Suez Canal passages and therefore, the ports' call in the Italian ports. It is important to underline how China made a significant investment in the Mediterranean infrastructures; indeed, the Italian government has suggested the Chinese, who have shown interest, various options for the use of its ports, both on the Tyrrhenian Sea, with Genoa, and on the Adriatic, with Trieste and Venice. However, the Polar Silk Route seems the new interest of China, and the Chinese Arctic strategy confirms this. The Polar Silk Route and the previously described Arctic routes create interests in shipping companies and stakeholders, especially when travel days, costs, and fuel consumption are significantly reduced. 80% of the maritime transport is in Chinese hands, representing a monopoly worth one million dollars per day. The Chinese Arctic operation called "White Dragon" aims to move 20% of merchant shipping across polar routes within ten years for a total value of $100 billion per year. First of all, Italy has to negotiate specific and advantageous agreements in order to maintain the ports' role essential and still at the center of maritime shipping. Italy has to keep strengthening its geographical position and "sell" it to foreign investors in order to keep boosting and enhancing its port's system. The second action Italy needs to take is looking at the long term and not let be overpowered by these new scenarios; it has to transform the ports, bogged down by bureaucracy and poor in infrastructure, into logistic platforms to induce the Asia countries, especially China, to root their commercial interests here. Italy can and will have to exploit its strategic position in the Belt and Road Initiative to keep alive the role of the Mediterranean. If Italy plays its cards right, it will still be a strategic area for Chinese trade, also in the light of the "polar route". Whoever is better equipped wins the challenge. Therefore, the keyword for the Italian port's system is competitiveness. The world maritime apparatus has to keep being competitive, innovate itself and provide services and infrastructures that the shipping companies cannot ignore. This is a challenge that needs to be faced with the competitiveness of the Italian ports' system and its annex logistic. An element of opportunity will prevail if Italian enterprises will seize the developments and the opportunities that the routes may present. This future condition will be a real challenge for Italy that, however, has decades of advance to study, analyze and discuss how to remain competitive. The opening of the Arctic routes is not about "if" but about "when", as the climate change and the continuously ice melting are demonstrating.

At the same time, Italy has to support the international position concerning the Arctic routes in order to boost and keep covering a role in the commercial, scientific and energy sectors. Even if the navigation of the Arctic areas will not be feasible in an economically viable way for at least another 15 years, Italy has the opportunity to influence the decision-making processes in this regard, putting on the table the advanced and prominent scientific research in the field and energy assets. Italy will have to support liberal and international positions regarding the Arctic trade routes; economic development of the region would offer important opportunities to Italian national enterprises in the commercial, energy and scientific fields. As previously analyzed, the opening of the Arctic routes would create some space for Italy to keep providing high-quality technologies and tools to conduct search and rescue operations, to provide ship building and scientific research and studies. The ability for Italy would be to keep defending its ports' system and infrastructures while not depriving itself of the numerous possibilities that the country can have in the Arctic region. Italy is thus called to a test of strength and resistance to influence decisions related to the future of the Arctic and the strengthening of southern routes through a strong partnership with China and the African continent in order to preserve the relevance of the Mare Nostrum.

Conclusions

The Arctic region is coming to the forefront in the last few years. The discovery of natural resources for energy production, the peacefulness of the area, and the climate change effects are the main factors that bring the region to the attention of the Arctic and non-Arctic states. For several years after the Cold War period, the region has remained outside the international scenario. Nowadays, security threats and issues call the attention of different states and actors looking at the region with different eyes. Climate change alters the environment, economic activities, human living conditions, and accessibility to the region. The ice is melting at a swift pace, and the five-year-old ice, the ice that has survived several summers, is almost disappeared. Most of the ice present in the region is one-year ice, which has been formed recently. In addition, the Arctic centrality is due to the increasing attention and interest in the natural resources' deposits present in the region. The extraction potentiality is massive, and different actors invest in different countries to take advantage of the region's potentiality. At the same time, the ice melting is creating more accessibility to the countries; indeed, Russia is increasing the military presence on the territory in order to defend its borders, for years considered impassable.

These conditions are creating both challenges and opportunities for the region. Therefore, it is important to consider how the Arctic and non-Arctic states have different interests connected to the same territory. Arctic states are trying to protect their territories, waters, flora, and fauna as much as possible to avoid external intrusion and guarantee their sovereignty over the Arctic. At the same time, non-Arctic states are looking at the region as a new essential and crucial actor in the international chessboard and are projecting their economic ambitions toward this new central region. Indeed, in 2018 China released the White Paper for the Arctic strategy where it surprisingly declared itself as a near-Arctic state and developed its plan and intentions toward the Arctic. The Chinese investments in the Arctic are massive, and its win-win approach aims to respect the Arctic states' sovereignty and cover a more prominent role in the region's future. This clearly shows how the region is not an isolated territory marginalized from the global scenario. Its resources and economic potential are attracting investments from non-Arctic countries, strongly influencing the region's balance and the Arctic states-attitude. Therefore, countries such as Canada and Russia are increasing their military presence in the region, the military exercises and are prioritizing different threats to monitor and control their territories.

It emerges how through the years, Italy, a non-Arctic country, managed to find its placement in the territory. Its interest in the region began for scientific and research aims, but it developed different and significant activities through the years. The research activities began with Umberto Nobile and its airship voyages over the Arctic to explore the region. Nowadays, Italy can contribute to studying, analyzing, and understanding the Arctic environment, its mutation, and the climate change effects. Italy can define itself as an active actor to ensure the environmental security of the region; indeed, thanks to the Italian research station Dirigibile Italia located in the Svalbard island, several projects of research and study are conducted. Next to the primary research station, the CNR built other observational platforms: the Amundsen-Nobile Climate Change Tower, the Gruvebadet laboratory, and the Mooring Dirigibile Italia. The constant cooperation with Italian universities and research organizations allows Italy to keep covering an essential role in the region.

Moreover, the third chapter highlighted how, thanks to the Italian Navy's High North campaign, Italy ensures the continuity of environmental observations useful to the international and national scientific community. Therefore, the national and international partnerships that the Italian Center for Research (CNR) establishes highlight the wide margin of growth that Italy can have in the region, presenting itself as a committed, well-equipped country in the research and scientific sector. The interviews conducted to the CNR researchers underline how Italy has a significant role in the region, and its best practices should be an example to imitate and look at. However, the main challenge for the country will be to consolidate its presence considering the dominant position of the Arctic countries and their interest in ensuring environmental protection. Nevertheless, important partnerships are developed among the Italian researchers and the Nordic actors to reach a common interest: environmental security and climate change mitigation in the region. A further crucial role that Italy covered and will keep covering is the energy producer. ENI's relatively recent Goliat platform is a real sign of the Italian capacity and economic interest in the Arctic. The new platform is expected to produce roughly 200 million barrels of oil in the next 15 years, ensuring a leading role for the Italian company in the region. This project has been developed in strict cooperation with Norway, respecting and presenting sustainable and environmentally friendly production and energy delivery standards. Moreover, ENI has demonstrated being active in the Norwegian Arctic, Russia and Alaska with important projects and extraction activities. ENI's vital goal is to reduce the activities' intensity emission of roughly 43% by 2025 compared to 2014 levels, reaching net-zero upstream emissions by 2030. ENI understood the importance of Arctic environmental security and understood how to keep covering a crucial role in the region. Indeed, it is necessary to deal with the most important security threats if the company wants to play a crucial role among Arctic countries.

Italian opportunities meet the naval sector, too; indeed, Italy has already demonstrated its capacity to deliver high-quality ships adapt to navigate the ice. The increasing possibility of new Arctic routes may open future opportunities for Fincantieri to deliver new, high technology and quality ships to navigate the Arctic ocean. Finally, the Italian company Leonardo emerged as a leading actor in several activities conducted in the region. The company has a prominent role in Search & Rescue activities, the most difficult ones to conduct in the fragile Arctic environment. Indeed, advanced helicopters, radars, and satellites facilitate every kind of activity, including navigation, shipping, and mapping of the territories. Italy is involved in different activities that are just at the beginning of its development. Italy has to find the right balance between sustainable economic development and environmental protection to keep acting in the region while presenting itself as a responsible actor.

The last chapters underlined how Italy could seize opportunities not only connected to the economic and company sector. Since 2013 Italy is an observer country in the Arctic Council. In the following years, Italy has to keep exploiting this privileged position to influence and be part of the decision taken in the region while ensuring the region's security from different prospects. Despite the last decision in the hands of Arctic countries, Italy can keep promoting an international approach in the region to cooperate with Arctic countries, influencing their decision-making process better and strictly. The positive contribution of the Italian participation in the Arctic Council has been further confirmed by the biannual fact-finding survey conducted in 2018 by the Italian III Commission of Foreign and Community Affairs. Italy will contribute in keeping the Arctic a low-tension and high-cooperation area in the coming years, meeting the Artic states' primary goals and needs. Italian political influence can still give a significant contribution in shaping the future of the region. It is crucial to underline the essential role that the Italian Arctic Table covers within the country; here, Italian universities, experts, researchers, political actors, and companies meet to discuss and analyze the priority for the country in the region and the contribution they can give. The Italian Arctic strategy does not foresee an Italian military or defense dimension in the region, but it is essential to underline how different Italian companies dispose of a dual-use capacity; indeed, a future military, and Italian defensive intervention in the region should not be excluded. The Italian Navy, Leonardo, and Fincantieri dispose of all the necessary tools that can be used both for civilian, military and defensive purposes. Italy can contribute to Arctic activities thanks to the navy's training, patrol activities, and military interventions. It is essential to consider how the Arctic will likely see increased tensions and security concerns from more accessibility to the region. Although criminal activities such as piracy and illicit traffic or weapons and drugs would be less frequent than in other world regions, they should not underestimate; indeed, the opening of the Arctic routes might favor non-states actors' access to

the region. This condition would create further opportunities for Italy to show its know-how and abilities that have been already deployed in different countries during critical situations.

Meanwhile, Italy will have to face a more significant challenge strictly connected to the Arctic region: the opening of the Arctic routes. The Northern Sea Route, the Northwest passage, and the Transpolar Sea Route are the three main routes that in about 10-15 years might become operative. The future opening of the routes will have a significant impact on the Italian port's system. Although no specific data are available yet, an important part of the commerce will be deviated and moved from the Suez Canal route to the northern ones. Indeed, some studies have demonstrated how the reduction in days and costs will be significant for shipping companies. One of the most emblematic case studies underlined how connecting Yokohama in Japan to Hamburg in Germany along the NSR reduces travel distance of 36% and travel times by 44%, with 14 days less than the Southern Sea Route (SSR) through the Suez Canal.

Nevertheless, some doubts and problems may arise from Arctic shipping, such as insurance costs and environmental risks. The future of Arctic shipping is uncertain, but the countries are already planning strategies, equipment, and plans in order to use these routes. Therefore, it appears that Italy has to prepare itself for one of the biggest challenges connected to the region. Italy has to study and develop a strategy in order to prevent any future impact coming from the deviation of the world trade toward the northern routes. The Italian port's system has to remain competitive and innovate its infrastructure in order to keep attracting shipping companies to its ports. At the same time, Italy has to negotiate favorable agreements with China to keep covering an essential role in the Belt and Road initiative and the Mediterranean Sea. Indeed, Italy has been actively involved in the Chinese BRI project, and the main challenge is to keep covering this role and not let northern routes overcome it. Italy has to find a balance between avoiding the decrease of trade in its ports and at the same time being politically involved in the Arctic affair to find a place and a role in the economic and commercial development in the region. Being marginalized in the Arctic routes development will not be beneficial for the country.

In conclusion, Italy has numerous possibilities and opportunities in the region. Its current activities and involvement dispose of all the elements to be implemented, cover an essential role in the region, and be turned into dual-use. Italian role in the Arctic Council will favor its possibilities and chances to influence the region's future, protect the environment, and participate in the routes' development.

Bibliography

III Commissione permanente (affari esteri e comunitari). *Indagine Conoscitiva Sulla Strategia Italiana Per L'artico*, 2018.

"Canada's Arctic And Northern Policy Framework". *Rcaanc-Cirnac.Gc.Ca*, 2019. https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587.

"Interview With Arctic Council Observer: Italy". *Arctic Council*, 2020. https://arctic-council.org/en/news/interview-with-arctic-council-observer-italy/.

"La Febbre Dell'artico". *Limes: Rivista Italiana Di Geopolitica*, no. 2465-1494 (2021): 1-279.

"What Is The Arctic? | National Snow And Ice Data Center". *Nsidc.Org*, 2020. https://nsidc.org/cryosphere/arctic-meteorology/arctic.html#:~:text=Most%20commonly%2C%20scientists%20define%20the,in%20the%20map%20at%20right).

Aalto, Pami. "Modernisation Of The Russian Energy Sector: Constraints On Utilising Arctic Offshore Oil Resources". *Europe-Asia Studies* 68, no. 1 (2016): 38-63. doi:10.1080/09668136.2015.1113509.

Arctic Climate Change Update 2019. Tromsø: Arctic Monitoring and assessment programme, 2019.

Article 234 UNCLOS And The Polar Code The Interaction Between Regulations On Different Levels In The Arctic Region". University of Oslo, 2014.

Auerswald, David. "NATO In The Arctic: Keep Its Role Limited, For Now - War On The Rocks". *War On The Rocks*, 2020. https://warontherocks.com/2020/10/nato-in-the-arctic-keep-its-role-limited-for-now/.

Cappelletti, David, Roberto Azzolini, Leonardo Langone, Stefano Ventura, Angelo Viola, Stefano Aliani, Vito Vitale, and Enrico Brugnoli. "Environmental Changes In The Arctic: An Italian Perspective". *Rendiconti Lincei* 27, no. 1 (2016): 1-6. doi:10.1007/s12210-016-0555-1.

Caruso, Alessandra, Ferdinando Sanfelice di Monteforte, Paolo Sellari, Manfred Hafner, Pier Paolo Raimondi, Andrea Perrone, Andreas Østhagen, and Andreas Raspotnik. *Formiche* 148, no. 1824-9914 (2019): 30-51.

Conley, Heather A. *China's Arctic Dream*. Washington: Center for Strategic & International Studies, 2018.

Cudennec, Annie, Denis Bailly, Emmanuelle Quillérou, and Mathilde Jacquot. "Artico: Opportunità, Problemi, Sfide". *Periodico Di Informazione Studi E Ricerche Sulle Regioni Artiche Et Antartiche*, no. 2 (2018): 32-46.

Geisler, Charles. "Cambiamento Climatico E Risorse Naturali Nell'Artico". *Human (In)Security E Ambiente*, 2016. https://www.ojs.unito.it/index.php/human-security/article/view/3557/3210.

Gunnarsson, Bjørn, and Sergey Balmasov. Maritime Traffic And Transportation Infrastructure Along The Northern Sea Route. Bødo, Norway: Nord University Business School, 2019.

Hansen, Carsten Ørts, Peter Grønsedt, Christian Lindstrøm Graverse, and Christian Hendriksen. *Arctic Shipping: Commercial Opportunities And Challenges*. Frederiksberg: CBS Maritime, 2016.

Humpert, Malte, and Andreas Raspotnik. "The Future Of Arctic Shipping Along The Transpolar Sea Route". In *Arctic Yearbook 2012*, 282.

Joël Plouffe. Northern Research Forum and the University of the Arctic Thematic Network (TN) on Geopolitics and Security, 2012.

Karkazis, John, Evi Bexevani, and Petros Siousiouras. "Arctic Routes' Impact On The Global Transport System", 2017, 21-32.

Kopra, Sanna. "China's Arctic Interests". *The Arctic Yearbook* 2013, 2013, 1-16

Kopra, Sanna. *The Arctic Institute China's Serie 2020*. The Arctic Institute, 2020.

Kuersten, Andreas. "The Arctic Five Versus The Arctic Counci". *The Arctic Yearbook 2016*, 2016, 389-395.

Lackenbauer, Whitney, and Adam Lajeunesse. "The Canadian Armed Forces In The Arctic: Building Appropriate Ca- Pabilities". *Journal Of Military And Strategic Studies* 16, no. 4 (2016): 7-76.

Lasserre, Frédéric. "Case Studies Of Shipping Along Arctic Routes. Analysis And Profitability Perspectives For The Container Sector". *Transportation Research Part A: Policy And Practice* 66 (2014): 144-161. doi:10.1016/j.tra.2014.05.005.

Laruelle, Marlène. Russian Military Presence In The High North. Russia In The Arctic. Strategic Studies Istitute, US Army War College, 2011.

Liu, Miaojia, and Jacob Kronbak. "The Potential Economic Viability Of Using The Northern Sea Route (NSR) As An Alternative Route Between Asia And Europe". *Journal Of Transport Geography* 18, no. 3 (2010): 434-444. doi:10.1016/j.jtrangeo.2009.08.004.

Mariia, Kobzeva. "China'S Arctic Policy: Present And Future". *The Polar Journal* 9, no. 1 (2019): 94-112. doi:10.1080/2154896x.2019.1618558.

Mehdiyeva, Nazrin. *Russia'S Arctic Papers: The Evolution Of Strategic Thinking On The High North*. Russian Studies Series 4/18. NATO defense college, 2018. https://www.ndc.nato.int/research/research.php?icode=567.

Melia, Nathanael, Keith Haines, and Ed Hawkins. *Future Of The Sea: Implications From Opening Arctic Sea Routes*. Foresight, Government Office for Science, 2017.

Melino, Matthew, and Heather A. Conley. "The Ice Curtain: Russia'S Arctic Military Presence". *Csis.Org*, 2021. https://www.csis.org/features/ice-curtain-russias-arctic-military-presence.

Mian, Marzio G. *Artico - La Battaglia Per Il Grande Nord*. Vicenza: Pozza, 2018.

Ministero degli Affari Esteri e della Cooperazione Internazionale. *La Strategia Italiana Per L'artico*. Rome, 2015.

Ministero dell'Università e della Ricerca. *Programma Di Ricerche In Artico 2018-2020*, 2018.

Ministry of Foreign Affairs and International Cooperation. *Towards An Italian Strategy For The Arctic - National Guidelines*, 2015.

Østreng, Willy, Karl Magnus Eger, Arnfinn Jørgensen-Dahl, Lars Lothe, Morten Mejlænder-Larsen, Tor Wergeland, and Brit Fløistad. *Shipping In Arctic Waters. A Comparison Of The Northeast, Northwest And Trans Polar Passages*. Arctic Yearbook. Chichester, UK: Praxis Publishing, 2013.

Palosaari, Temuu. "Cambiamento Climatico E Risorse Naturali Nell'artico". *Human (IN)Security E Ambiente* 2, no. 2531-4998 (2016).

Perovich, Donald, Walt Meier, and Simon Hendricks. *Arctic Report Card 2020: Sea Ice*. Arctic Report Card: Update For 2020The Sustained Transformation To A Warmer, Less Frozen And Biologically Changed Arctic Remains Clear, 2021.

Petroni, Federico. "Centralità E Fragilità Strategica Dell'artico". *LIMES Rivista Italiana Di Geopolitica*, 2019.

Snow, Water, Ice And Permafrost In The Arctic (SWIPA) 2017. Oslo: Arctic Monitoring and Assessment Programme (AMAP), 2017.

Petrov, Andrey N. "Exploring The Arctic'S "Other Economies": Knowledge, Creativity And The New Frontier". *The Polar Journal* 6, no. 1 (2016): 51-68. doi:10.1080/2154896x.2016.1171007.

Sardellone, Gianluca. "L' Artico Nella Geopolitica Del III Millennio". *Informazioni Della Difesa*, 2015.

Schøyen, Halvor, and Svein Bråthen. "The Northern Sea Route Versus The Suez Canal: Cases From Bulk Shipping". *Journal Of Transport Geography* 19, no. 4 (2011): 977-983. doi:10.1016/j.jtrangeo.2011.03.003.

Scott Zellen, Barry. *The Fast-Changing Arctic: Rethinking Arctic Security For A Warmer World*. Ebook. 1st ed. Calgary: University of Calgary Press, 2013.

Statement On Canada's Arctic Foreign Policy: Exercising Sovereignty And Promoting Canada's Northern Strategy Abroad. Government of Canada, 2017.

Su, Ping, and Maximilian Mayer. "Science Diplomacy And Trust Building: 'Science China' In The Arctic". *Global Policy* 9 (2018): 23-28. doi:10.1111/1758-5899.12576.

The Arctic Route. Climate Change Impact, Maritime And Economic Scenario, Geo-Strategic Analysis And Perspectives. SRM and Intesa San Paolo, 2020.

The State Council Information Office of the People's Republic of China. *China'S Arctic Policy*. Beijing, 2018.

Thoman, Richard T., Jacquline Richter-Menge, and Matthew L. Druckenmiller. *Arctic Report Card 2020*, 2020.

Troubled Waters. How To Protect The Arctic From The Growing Impact Of Shipping. Brussels, Belgium: Soft Free and European Federation for Transport and Environment (T&E), 2012.

Van Hussen, Karel, Twan de Korte, Rick Janse, Onno de Jong, and Marten van den Bossche. "International Transport Forum Discussion Papers", 2019, 1-27. doi:10.1787/2223439x.

Verny, Jerome, and Christophe Grigentin. "Container Shipping On The Northern Sea Route". *International Journal Of Production Economics* 122, no. 1 (2009): 107-117. doi:10.1016/j.ijpe.2009.03.018.

Wieslander, Anna. "NATO Must Engage In The Arctic". *Defense One*, 2019. https://www.defenseone.com/ideas/2019/09/its-time-nato-arctic/159887/.

Williams, Paul D., and Matt McDonald. "Environmental Change". In *Security Studies An Introduction*, 526-541. Simon Dalby, 3rd ed. New York: Routledge, 2018.

Yumashev, Dmitry, Chris Hope, Kevin Schaefer, and Kathrin Riemann-Campe. "Climate Policy Implications Of Nonlinear Decline Of Arctic Land Permafrost And Other Cryosphere Elements". *Nature Communication*, 2021.

Zeeshan, Raza. "A Comparative Study Of The Northern Sea Rout (NSR) In Commercial And Environmental Perspective With Focus On LNG Shipping". Master degree, Vestfold University College, 2013.

Zhang, Yiru, Qiang Meng, and Szu Hui Ng. "Shipping Efficiency Comparison Between Northern Sea Route And The Conventional Asia-Europe Shipping Route Via Suez Canal". *Journal Of Transport Geography* 57 (2016): 241-249. doi:10.1016/j.jtrangeo.2016.09.008.

Zhu, Shengda, Xiaowen Fu, Adolf K.Y. Ng, Meifeng Luo, and Ying-En Ge. "The Environmental Costs And Economic Implications Of Container Shipping On The Northern Sea Route". *Maritime Policy & Management* 45, no. 4 (2018): 456-477. doi:10.1080/03088839.2018.1443228.

Summary

The Arctic region is coming to the forefront of the international scenario. For several years, during the Cold War, it has been an area of confrontation and military challenges. After some years of marginalization, the region is becoming a crucial area in the international chessboard. There are two main current views regarding the region's consideration. For some actors, the Arctic is characterized by a regional identity, strictly belonging to the eight Arctic countries. Conversely, other scholars believe that the region is a global common since it lacks the fundamental elements that usually characterized a political-geographical region (the amount of population living there, stable and organized presence of human groups, specific local governance and well-defined territory). The first school of thought has a realist approach that considers the Arctic as a competitive arena where Arctic states' individualistic approach should prevail. The other approach is more liberal and perceive the region as a place where cooperation among different Arctic and non-Arctic states can favor progress and collective security. The clash that emerges from these two prospects reflects the region's management, considerations, and ambitions.

Several factors and elements characterize the region and make it the center of attention for the Arctic and non-Arctic countries. The Arctic is a central area, but its strengths and fragility are mixed up and represent the main reason for its new centrality and importance. One of the first elements that makes the region so crucial is its energy potential; indeed, the region owns 13% and 30% of undiscovered, but technically recoverable, reserves of oil and gas; moreover, roughly 2.8 million square kilometers are available for international exploitation. This is the main reason why countries are looking at the region with immense interests. Further crucial resources are abundant in the region; the fish stock makes the Arctic one of the most important global fishing grounds attractive to several vessels from different countries. Moreover, the region owns one of the most extensive boreal forests on earth, characterized by strict environmental regulations limiting its exploitation. The increasing attraction toward the region is also defined by the necessity to discover the region, one of the most unknown on earth. The state-research nexus is the primary fuel for several countries to contribute to discovering and protecting this fragile region. New core drilling techniques to extract cylinders from glaciers and polar shelves are giving scientists new opportunities to study polar algae and dust pollutants to better understand and study the region's food chain and biological systems. The actors that invest more in the research could have significant leverage in the influence over the region. In addition, the centrality of the region is connected to the possibility of opening the Arctic routes. This possibility is attracting several different countries even not included in the Arctic eight since the travel days and costs would

be significantly reduced. At the same time, this possibility opens critical prospects connected to the environmental security of the region. Several doubts emerge from the potential impact that the increasing accessibility of the region might imply. The increasing amount of CO_2 in an already vulnerable region worries some countries and scientists. However, states are seriously considering the Arctic routes as an additional trade route to the already established and used ones.

Climate change is the biggest threat to the region, and since 2011, all the values related to ice melting, ice thickness, and temperatures are getting worst. Although the Arctic region occupies a small area of the world, it is a vital region for the global climate balance. Indeed, what happens in the Arctic does not remain in the Arctic. The ice melting and the growing temperatures imply consequences all over the world. 2020 has been defined as the second-worst year in terms of temperatures, following 2016, since the recording began in 1990. The August average temperatures of the sea surface were 1-3°C warmer than the August average for 1982-2010. The ice of the region is becoming thinner with a significant reduction of km^3 in sea ice volume. The scholars forecast a loss of 13% of sea ice every decade, with the dangerous possibility of an ice-free Arctic area by summer 2030. The point of no return is passed. It is crucial to underline how most of the ice present in the region is "first-year ice," and the old one, which is more than four years old, is disappearing. This is a further element that indicates how an ice-free region is not too far. Permafrost is melting too due to the increasing temperatures. Since 2007, the permafrost warmed more than 0.5°, and its melting has increased during summer. The permafrost holds 50% of soil carbon. Its thawing will contribute to further greenhouse gas emissions that have been trapped in the ground for millennia, further worsening the planet's already precarious environmental conditions.

The following decades are not promising; indeed, the temperatures are expected to grow by 4°, setting new records. The permafrost in the North Hemisphere is expected to be reduced by 20% by 2040, and it could be reduced by two-third by 2080 if greenhouse gas emissions are not cut. Moreover, the possibility of sea rise will create a crucial threat for different countries all around the globe, forcing people to move and species to extinguish. The estimated costs for the climate change effect on Arctic amount between USD 70-90 trillion for the period 2010-2100; the most urgent action that needs to be made is stabilizing Arctic warming with a clear cut in the greenhouse gas emission, the cause of most of the analyzed phenomena. This situation is alarming countries, scholars, indigenous population and the whole international community. Different actors are committing themselves to protect this region, promote a sustainable development and operating in the region while respecting the environmental standards.

The Arctic governance is in the hand of two main groups: the Arctic Five and the Arctic eight. The Arctic Five are the five littoral states of the region (United States, Russia, Norway, Denmark, and Canada) that discuss the most critical issues and matters connected to the region. These actors are not separate entities from their states' power, nor are they in contrast with them. In addition, there is not a permanent legal structure that constitutes them; however, their importance and relevance should not be underestimated since the decisions and gatherings of these states have a strong influence and repercussion on the whole Arctic region. The other group of states is the Arctic eight, including the previously mentioned five states plus Finland, Sweden, and Iceland. They make up the Arctic Council. The Arctic Council is an intergovernmental forum that aims to address and discuss issues connected to environmental security, sustainable and economic development through cooperation and coordination. Different from the Arctic Five, the Council can create binding agreements among the member states. The Council is composed of different additional actors: working groups, observers, and indigenous people. All together contribute to the interest and the safeguard of the region. One of the most important decisions related to the creation of the Arctic Council is the impossibility of discussing military security. The declaration affirms: "the Arctic Council should not deal with matters related to military security". However, the terminology "should not" leaves some space for a future change of direction in the Council.

When the Arctic Five signed the Illulisat declaration that created them, some concerns emerged among the Arctic Council about a possible marginalization of the forum and a reduction of the five states' participation. The Arctic five was perceived as a forum where several actors and issues were left outside; moreover, possible issues and discussions may have emerged, risking to arrive at the Council already settled and altered in form and final solutions. However, a synergy between the two exists. If the two fora are perceived as complementary, ideal cooperation might occur for the interest of the Arctic. Among the Arctic Five is possible to discuss issue and topic in a faster and dynamic way, taking into consideration the real essence of the issues at stake and the common interest of the five states, sometimes far from all the other actors involved in the Arctic Council. The Arctic Five slenderness would allow to involve non-Arctic states when deemed necessary and allow them to have a significant contribution in the discussion. Instead, the main advantage of the Arctic Council is its administrative and permanent structure together with the constant participation of working groups that can produce a constant flow of Arctic data. In conclusion, the activities of the two fora, despite seeming opposite, are intertwined; the rules-free nature of the Arctic Five and the binding and well-structured apparatus of the Arctic Council can be complementary in the activities aimed at reaching the best international governance for the Arctic region.

Unlike Antarctica, the Arctic is not regulated by an international treaty, but its governance falls under the Arctic states' jurisdiction within the UNCLOS Convention. The fundamental division of the maritime zone made by the Convention is essential for the management of the region and its abundant reserves of resources, mainly located in the Exclusive Economic Zone of the states. However, UNCLOS has been considered a successful tool to regulate the region until the mid-2000s. Indeed, climate change started to present new challenges that the Convention did not directly included and address. Indeed, article 234 is the most criticized since it lacks maritime jurisdiction over ice-covered waters and cannot regulate the consequent Arctic Ocean navigation. Moreover, the definition present in the article does not correctly define what an ice-covered area means, creating a different perspective about the legal status of the polar sea routes on each side of the Arctic Ocean. Indeed, both Russia and Canada are claiming some part of Arctic routes within their national waters, clashing with the international recognition attributed by the United States. These disputes are still ongoing and need to be settled.

In 2017, the International Maritime Organization released the Polar Code. This Code covers the full range of issues relating to navigation in the waters surrounding the two poles. The Code affirms and recognizes how the Arctic coastal communities may be in danger, and how the ecosystems are victims of human activities, such as shipping and ground exploitation. Therefore, the Code lists the sources of risk for this region: ice, low temperature, high latitude that influences the navigation and communication systems and continuous period of dark or daylight, lack of crew's experience in this outer region, and extreme weather conditions. The Code falls under the UNCLOS definition of "generally accepted international norms and standards"; therefore, states are responsible for its enforcement. The Code aims to regulate the technical aspects that can be caused by unforeseen events in polar navigation, particularly regarding the construction of ships, the preparation of seafarers, and rescue operations. The Code aims to deepen some crucial issues not present in the UNCLOS convention in order to ensure the highest level possible of multidimensional security in the Arctic.

There are several countries involved in the region, owing interests and claims and intended to protect them. The main actors involved in the region are the Arctic countries with Russia and Canada owning the most part of the domain. However, recently some new non-Arctic actors are emerging claiming rights in the territories.

Russia

Russia is one of the most crucial actors involved in the region; its coastline accounts for 53% of Arctic Ocean coastlines. Lately, the Russian interest in the region has increased, primarily focused on an

economic perspective. Indeed, the country aims at exploiting the resources that the region offers, mainly located in its territories. In order to achieve this aim, Russia developed several different strategies for the Arctic, moving every time the targets and ambitions. Russia owns 90 billion barrels of oil and 47 trillion cubic meters of gas located in its Exclusive Economic Zone (EEZ) that still need to be extracted yet. They are equivalent to roughly 14% of Russian oil and 40% of Russian gas. The goal of president Putin is to reach 30% of hydrocarbons' country production in the Arctic by 2050. Russia aims to become a leader in LNG gas production, and the Yamal plant is contributing to reaching this goal. At the same time, Russia is driving a military buildup in the region: new military bases, growing exercises, and increasing deployment of forces are occurring in the Arctic Russian to protect and defend the country from possible threats and clashes on the region. However, despite the Russian Strategy Policy in the Arctic until 2035 discusses international cooperation and dialogue, it devotes more space to threat scenarios for the country.

China

In 2018 the country released the White Paper of China's Arctic Strategy, presenting itself as a "near-Arctic state". With this document, China wanted to affirm itself as one of the main countries involved and interested in Arctic affairs and declared its ambition to invest and develop the region. In order to achieve its ambitions and aims, China uses the "win-win strategy"; this strategy aims to boost bilateral relations with Arctic states and strengthen Chinese responsibility in Arctic matters. The win-win outcome can occur if there is equity, meaning that all parties are of equal status. Despite the several significant investments China is conducting in the Arctic countries in energy and infrastructures terms, the most crucial plan is developing the Polar Silk Route (PSR). The PSR is part of the Belt and Route Initiative and aims to exploit the Northern Sea Route, one of the three main Arctic routes, to connect China with Western markets faster and efficiently. China is interested in importing raw materials and especially gas from the north of Russia while implementing its exports toward Europe.

Canada

Ottawa is fully aware of the growing attention toward the region and is conscious of its crucial role as Arctic states. Indeed, over time, Canada has welcomed the prominent status of the Arctic and the resulting increase in Arctic activities. Consequently, Canada has been starting to update and modernize its foreign policy in the region. Recently the focus of the country moved from convention to non-conventional threats. These do not arise from armies and military exercises but events connected to trade, shipping, scientific research, and tourism. Canada understood the importance of multidimensional security issues in the Arctic, and thanks to its Arctic Policy Framework, the country

set different-nature priorities to address through 2030. One of the most important issue that Canada underlines in its strategy is the importance of its identity and sovereignty in the region. The Canadian sovereignty deals with security and identity: states defend their sovereignty primary to safeguard their values and interests in the region. The Canadian sovereignty is broad since it includes archipelagic waters, defense, external threats, partnership with local communities and nation building activities. However, the main goal for Canada is to keep its sovereignty over the territories rather than increase its defense and conflictual attitude in the framework of growing attention toward the region. Trudeau administration has been particularly focused in representing Canada as a leader in the regional development and control. Ottawa manages to position itself a leader in the Arctic governance that also includes scientific research. The main focus on regulatory and co-management systems to reinforce the image of a country has been considered the strengths of the country. Due to concerns for its national security and the priorities of citizens residing in the northern Canadian territories, Ottawa's Arctic security policy tends to be more local than circumpolar and focuses on unconventional threats arising from the changing configuration of the Arctic.

International Organizations

States are not the only actors involved in the region, but international organizations cover an essential role as well. Five of the eight Arctic states are members of NATO, which, therefore, has a direct connection to the region. However, NATO does not have a clear and specific strategy for the Arctic. Some scholars believe that NATO should either increase its presence in the region and create a security forum with Russia or create its emergency plan. Other scholars who own a softer position affirm that there is no consensus among the states, and the Arctic states should better manage the security issues individually. A combination of the two options should be the best solution for the Alliance. An Arctic alliance command could be premature and might risk increasing both tensions with Russia and disequilibria within the Alliance where some states might consider the priority of a NATO response as a weakening of their sovereign control over their territory; in the same way, creating a security forum with Russia is not the best option to manage the region. However, the alliance should conduct some programmed and regular exercises on the territory. This could prepare NATO for the increasing number of threats in the region. States are aware that the region is becoming a crucial location both for Arctic and non-Arctic states and the main international organization has to be prepared in future regional developments. However, these exercises should be conducted following rules and pacific ways not to increase tensions and suspects from Russia.

Even though three members of the Arctic Council are part of the European Union, the EU has not been able to develop a clear policy for the Arctic. Numerous declarations have been made about the importance of climate change and security issues for the region, but few concrete actions have been made. The debate in Brussels is divided among the ones that want to refer to the Arctic for its environmental importance and the crucial effect of climate change and those who believe that Arctic states and security issues should represent the priority. In 2020 The European Commission began consultations to develop a new EU's Arctic policy. The main questions to ask are: firstly, what does the Arctic mean for a block of 27 states at the beginning of an era of global change? Secondly, what can the EU do to shape the future of the Arctic in a European approach?

Italy has a long-lasting connection and interests in the region, and four are the main areas that drive the Italian involvement in the Arctic. The historical-cultural bond that Italy has with the region thanks to the numerous explorations conducted by Nobile and further researches; the political involvement and the official status of observer in the Arctic Council; a prominent role in the scientific research to analyze and study climate change effects and environmental conditions and finally, an economic involvement connected to resources exploitation, energy production, and maritime construction. Italy's main interests and opportunities in the Arctic concern scientific research, meteorology, climate, Arctic challenges, and effects of climate change, which in large part stem from the phenomenon of global warming. At the same time, Italy looks at an international accreditation in a geographically distant area but directly connected with its interests: economy, resources, and commercial routes are relevant issues for a country that owns advanced tools to play a crucial role.

In 2013 Italy became an observer in the Arctic Council; thanks to this position, Italy can have a say in Arctic matters and participate in meetings and discussions. Therefore, this choice has geostrategic reasons related to the need to intensify the political commitment and the already in place activities in the region. The special Italian Envoy for the Arctic, Carmine Robustelli, the Minister Plenipotentiary at Italy's Ministry of Foreign Affairs and International Cooperation, administrates this position. As the next step, in 2015, Italy released the Arctic strategy where all the Italian interests and aims are presented. Italy delineated five main dimensions in the strategy. The first one is politics; the strategy underlines the importance of the Italian participation in the Arctic Council, and it highlights the significant scientific contribution that Italy brings to the region. The second dimension concerns the environment; Italy, with its advanced tools and its excellent scientific and technological research, offers essential instruments and strategies to fight the increasing Arctic challenges: climate change, loss of biodiversity, atmospheric pollution, the environmental risk connected to maritime shipping, water pollution, and tourist activities' impact. The third section focuses on the human dimension of

indigenous populations and urban areas. Here Italy compares some Arctic conditions to some Italian mountain's realities and the Alps Convention. The fourth dimension describes the Italian scientific approach; Italy aims to increase Arctic observation, both with coordinated monitoring and oceanographic research expeditions. Finally, the fifth dimension underlines the economic involvement of the country; this includes oil and gas research and exploitation, naval construction, and search and rescue activities. All these activities are conducted in compliance and entirely in the Arctic environment and sustainable development.

The country's strengths are represented by the National Council for Research (CNR). The (CNR) is a prestigious research organization with the mission of internationalizing the national research system and providing cutting-edge technologies in both the public and private sectors. The most important station where the CNR operates is Dirigible Italia, in Ny-Ålesund. This site cooperates with other international stations of research, and its main aim is to determine the components of the energy balance at the surface, their temporal variations, and the role of different processes involving air, snow, ice, and land (permafrost and vegetation). One of the crucial scientific activities is the Italian Navy's campaign High North, coordinated and conducted by the Italian Navy's Hydrographic Institute, with various national and international research organizations such as NATO and CNR. The campaign mainly focuses on the observation and exploration of the maritime environment thanks to new technologies and tools to ensure scientific research and environmental protection. The scientific sector can have numerous opportunities in the region for the following years; climate change and ice melting are optimal conditions to study and analyze in-depth. Moreover, the opportunities to operate in the Arctic region will expand also thanks to an increase in the technological innovation. In the interview conducted at the Italian Institute of Polar Science, Vito Vitale, an atmospheric physicist of the CNR, underlined how the biggest challenge for Italy would be keeping and consolidating the Italian presence in the region. He underlined how despite the long Italian involvement in the territories, the region is dominated by Arctic countries, well-developed countries. Italy has to keep a high level and continuously valorize its activities in the region to give a significant contribution to the environmental security of the Arctic and support these countries. At the same time Warren Cairns, an analytical chemist of CNR underlined the primary role that Italy can have in the country: sea rising, fires, sea pollution, and air quality concerns are all events that Italy has to deal with and can manage in the Arctic region as well. Exporting the Italian best practices is a key issue for its future involvement in the Arctic.

Numerous Italian companies work and operate in the Arctic, covering a crucial role as stakeholders. They conduct their activities with high-quality technologies, in full respect of the environment.

Indeed, countries tend to be particularly selective in choosing the companies that can operate in a fragile and vulnerable region as the Arctic; only those most environmentally sensitive, technologically advanced, and financially stable are suited to attempt these ventures in the Arctic. Therefore, the Italian participation in the Arctic is a confirmation of its advanced and high-quality tools and technologies. The area of intervention is broad and numerous and they highlight the strong contribution that Italy can provide in the region.

Eni is one of the most important companies involved in Arctic gas and oil extraction. Eni is mainly present in Norway since 1965. The most important project developed by the company is called Goliat. Goliat is the biggest cylindrical floating offshore platform located in the Barents Sea for oil production and storage, expected to produce roughly 200 million barrels of oil in the next 15 years. For its construction Eni, completely respected the environmental standards and created a structure able to adapt to extreme Arctic weather. Eni owns a decarbonization strategy that wants to pursue in the following years in the Arctic too. The strategy aims to reduce the activities' intensity emission of roughly 43% by 2025 compared to 2014 levels, reaching net-zero upstream emissions by 2030. These goals will impact the whole energy portfolio and, if the company wants to keep covering a leading role in the Arctic, it needs to monitor and update its progress constantly.

Fincantieri is a further company particularly active in the region; indeed, it has already demonstrated its ability in delivering ships able to navigate polar waters. In the following years, the company might cover an essential role due to the possible opening of the Arctic routes. Several additional icebreakers and ships able to cross the northern seas will be required, and Fincantieri owns all the capacity to become a leader in the region.

Finally, Leonardo is one of the biggest global companies operating in the aerospace, defense, and security sector. The company owns tools and services to operate in different scenarios: helicopters, aircraft, electronics for the defense, and security and defense systems; moreover, it operates in the space sector with civil and military activities. Thanks to its sustainable approach and its high-tech instruments, Leonardo is active in improving maritime awareness, traffic monitoring, and providing safety geo-information on the sea status and real-time information. The future of the Italian company in the region presents several opportunities; the increasing climate change, the possible opening of the Arctic routes, and the increasing accessibility to the region will increase Leonardo's presence in the Arctic; indeed, there will be an increased necessity in safeguarding, protecting and monitoring an environment and a region that is becoming crucial in the international chessboard. The necessity of

delivering crucial information in optimal timing and faster and different intervention modalities will be some of the most critical aspects Leonardo will keep basing its activities on.

The following years are promising for Italian participation and involvement in the region. In the interview conducted with Alberto Colella, the Italian ambassador in Oslo, underlined how Italy could find wade space in the Arctic political debate and economic development. Moreover, he was confident that the Italian scientific and research involvement in the region will be continuous and productive; the Italian involvement in the region begun for scientific and research aims and this will keep being the main reason for participation. One of the main peculiarities of the Arctic is the necessity of being present in the region with a high level of technological development and tools; Italy boasts a very high level of equipment in the sector, thanks to which it has gained an advantageous position in the region that ensures safe and cautious participation in the area. In the coming years, political participation will be significant as well; until now, its role in the Arctic Council has guaranteed a high level of collaboration and involvement. Italy will keep the Arctic a low-tension and high-cooperation area in the coming years, meeting the Artic states' primary goals and needs. Nevertheless, in the Italian Arctic strategy, the world defense never appears, and the world security is referred exclusively to marine and environmental protection, not giving Italy a defensive role in the region. However, it is essential to consider that the region is coming to the center of the attention and several threats are increasing. The easier access might implement, even if with less intensity compared to other territories, transnational crimes and favor illicit traffic and piracy. Since Italy owns several platforms and interests in the region, it will be necessary to consider an increasing role for the country from a defensive perspective. In their current state, Arctic countries have neither a system-based understanding of these threats, a differentiated approach to assessing specific types of potential maritime criminal activities, nor developed practical measures aimed at their prevention and suppression. Most of the Arctic states lack resources and know-how to address the threats that could emerge from the increasing accessibility of the region. Consequently, Italy might reevaluate its role in the region in connection with the possibility of growing security threats. A dual-use can characterize different Italian companies in the Arctic: indeed, Leonardo and the Italian Navy own tools and instruments to operate both for civilian, military, and defense aims. In addition, Italy owns the know-how and high technologies to offer support, training, and cooperation to the Arctic states in order to address different security threats in the region; therefore, the Italian military presence in the Arctic in the following years need to be taken into consideration.

Italy owns all the tools and instruments to keep covering an essential role for the future Italian economic involvement in the region. From an economic perspective, the Italian industries aim to be

part of the Arctic sustainable development and the delicate environmental equilibrium. According to Minister Plenipotentiary Carmine Robustelli, the special envoy for the Arctic, the Italian industries will keep covering an essential role in the region thanks to their advanced technology disposal and competencies; in the interview conducted, he affirmed how the Italian future contribution to the Arctic would be remarkable and fully in line with the environmental standards and principles of this fragile region. In the same way, the future opening of the Arctic routes creates interesting prospects for the Fincantieri's participation in the shipbuilding. The company has already demonstrated its capacity in delivering icebreakers for Arctic seas to countries such as Norway. Robustelli underlined how all these prospects represent both opportunities and challenges for Italy. Italy wants to flank the Arctic states and ensure that Arctic tensions are as low as possible while finding a place for its economy and activities. Italy needs to find the right balance between these two objectives to keep a prominent role in the region and keep cooperating next to Arctic states. Italy has to keep presetting itself as the country that can support training, tools, platforms, know-how, and expertise all the Arctic countries in fighting the increasing threats to the Arctic. Climate change is going to be the most significant challenge the region has to deal with. This is why Italy has to keep implementing its role in the region and implementing international partnerships and agreements to tackle the most significant threats. The forthcoming COP under the UK and Italian leadership that will take place in fall 2021 could be an optimal international scenario to achieve this aim and stressing the precarious and fragile condition of the Arctic.

One of the most significant aspects connected to the Arctic is the future opening of the Arctic routes. Three are the main routes that cross the Arctic seas: the Northern Sea Route, the Transpolar Sea Route, and the Northwest Passage. The NSR is the main route in the Arctic, and it connects East Asia with the western markets. Currently, the route is under Russian jurisdiction since it mainly crosses territorial waters. The centrality of the routes lies in its capacity to shorten the days of travel, the nautical miles, and the costs when shipping from East to the West, compared to the traditional route through the Suez Canal. Indeed, some scholars analyzed the trade route through the NSR from Yokohama in Japan to Hamburg in Germany. The presented data demonstrated how the distance and the days of traveling would be reduced respectively by 36% and 44% compared to the traditional Suez Canal route. Moreover, a crucial factor in the increasing attraction toward the NSR lies in ensuring environmental sustainability and promoting environmental security thanks to a vital reduction of carbon dioxide (CO_2) emissions. In the same way, the transpolar Sea Route and the Northwest Passage show a significant reduction in costs and travel days compared to the Suez Canal Route. This is why several different states are posing attention to the area. Therefore, China included the NSR in its Belt and Route initiative. The main aim is to expand and diversify its trade routes,

reducing costs and saving travel days. This is why the country is conducting massive investments in the Arctic countries, strictly cooperating with Russia. Moreover, Russia has a long-lasting experience in Arctic navigation and, in the coming decades, ships of any flag will depend on Russian icebreakers to escort them; Russia owns more than forty icebreakers while China only two.

The growing attention toward the Arctic routes has a significant impact on the different trading routes and different countries. The Mediterranean Sea covers a strategic role in the maritime shipping sector; indeed, 20% of global shipping is located in its seas. On a geo-economic level, the Mediterranean interfaces the large Atlantic and northern European markets on one side and the Asian and African markets on the other. For these reasons, the centrality of the basin in international scenarios is a decisive factor in attracting public and private investments in the transport and logistics sector, which continue to grow despite certain critical social and political situations. Indeed, the route's opening will deviate part of the trade from the Suez Canal, the main trading route connecting Asia to western Europe markets, to the far north. The Suez Canal confirms itself as a strategic hub for global merchant shipping traffic; 90% of international trade uses this major transit route. In this context, Italy owns an advantageous position; indeed, it covers the role of a strategic hub with its numerous ports. The prediction of the opening of the Arctic routes is something that the country has to study and analyze carefully. This would imply a significant deviation of trade, a decrease in call ports, and a loss for the Italian ports system. Although official data are not available yet, Italy has to deal with and face this future challenge.

The scholars affirm that it is possible to talk about complete navigability for the Arctic routes in 2035-2040. However, Italy has to be prepared and to develop a plan not to lose significant economic revenue. Therefore, the keyword for the Italian port’s system is competitiveness. The world maritime apparatus has to keep being competitive, innovate itself and provide services and infrastructures that the shipping companies cannot ignore. This is a challenge that needs to be faced with the competitiveness of the Italian ports’ system and its annex logistic. Italy has years of advance to study, and monitor the situation and develop an efficient plan. At the same time, Italy has to support the international position concerning the opening of the Arctic routes. If, on one hand, it risks hurting the Italian port’s system, on the other it can be considering a future source of revenue. Italy will have to support liberal and international positions regarding the Arctic trade routes; economic development of the region would offer essential opportunities to Italian national enterprises in the commercial, energy and scientific fields. As previously analyzed, the opening of the Arctic routes would create some space for Italy to provide high-quality technologies and tools to conduct search and rescue operations and provide shipbuilding and scientific research and studies. The ability for Italy would

be to keep defending its ports' system and infrastructures while not depriving itself of the numerous possibilities that the country can have in the Arctic region.

In conclusion Italy can seize different opportunities in the region and keep developing its companies. Its role in the Arctic Council allow a constant participation in the political regional debate and allow the country to have a relevance in the region. Leonardo, Fincantieri and Eni operate in a favorable environment that is presenting challenges these companies can strongly address. The Arctic opportunities offer Italy different and numerous possibilities to keep growing, being a role model in the region and provide expertise, tools and know-how to the Arctic countries. At the same time Italy has to carefully monitor the challenges that the region presents. If on one hand the opening of the Arctic routes can bring economic advantages in the shipbuilding, surveillance and search and rescues sectors, on the other hand they risk to impact the Italian port's system. The challenge for the country is to remain competitive, keep offering high quality services and constantly modernize and implement its infrastructures.