



**Sergey Sukhankin**



**CMSN**  

---

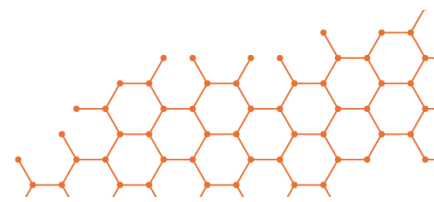
**REPORTS**

# **ICEBREAKER DIPLOMACY**

**RUSSIA'S GAMEPLAN TO WIN THE SCRAMBLE  
FOR THE ARCTIC**

Cover Image: The Russian icebreaker Yamal, Canadian icebreaker Louis S. St. Laurent and the Coast Guard Cutter Polar Sea rendezvous near the North Pole (USCG photo by LCDR Steve Wheeler)

© Canadian Maritime Security Network  
April 2026



## Acknowledgements

This publication was funded in 2025 by the Russia Strategic Initiative, U.S. European Command. The views expressed in this publication do not necessarily represent the views of the Department of War or the United States Government.

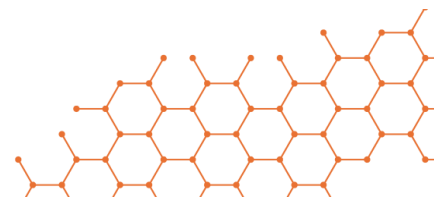


### **Sergey Sukhankin**

Senior Fellow, The Saratoga Foundation  
Research Fellow and Project Head, The Jamestown Foundation  
Postdoctoral Fellow, Canadian Maritime Security Network

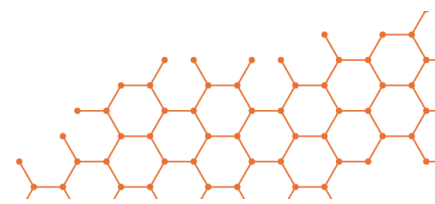
### **"Icebreaker Diplomacy": Russia's Gameplan to Win the Scramble for the Arctic**

April 2026



# Contents

Executive Summary .....	5
Introduction .....	6
Icebreakers in Russia's Arctic Strategy .....	7
Russia in the Arctic: Continuity and Tradition.....	7
The Role of the Soviet Legacy in Russia's Contemporary Arctic Leadership .....	7
The Role of Icebreakers in Russian Strategic Documents Across the Putin Era.....	10
Conceptualization of the "Icebreaker Diplomacy" Term .....	12
The (New) Scramble for the Arctic and the Role of Icebreakers .....	14
Russia's Perception of the Scramble for the Arctic .....	14
Russia's Icebreaker Fleet: Types/Classes, Roles, Areas of Employment, and Application .....	16
Drivers of Vulnerability in Russia's Arctic Icebreaker Superiority.....	22
Future Scenarios: What Is Likely to Happen Next?.....	23
Conclusion.....	26

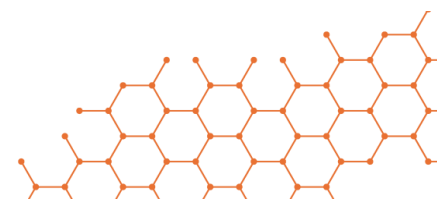


## Executive Summary

Russia's Arctic strategy is built on the premise that icebreakers are the decisive enabler of economic development, military mobility, and geopolitical influence in the High North. Russia possesses the world's largest and most capable icebreaker fleet, a tradition following from the pre-Soviet era. Icebreakers provide year-round access across the Northern Sea Route (NSR), enabling hydrocarbon exports, supporting remote populations, and sustaining military and scientific activity. These vessels play a multidomain role: not only logistical platforms but also instruments of statecraft, soft power, and, increasingly, deterrence. Russia treats the fleet as central to national security, positioning nuclear and diesel-electric classes alongside new, armed patrol icebreakers capable of hybrid missions. Following the outbreak of the full-scale Russo-Ukrainian war, some vulnerabilities have started to appear. Western sanctions (after 2022) have disrupted supply chains, elevated production costs, and exposed Russia's dependence on foreign technologies, despite official claims of self-sufficiency. External developments - such as NATO's Nordic expansion, U.S.-Canadian-Finnish icebreaker cooperation, and China's cautious pursuit of its own icebreaking capabilities - suggest intensifying competition; it is not clear if Russia will be able to find counterarguments in the longer run. In the short term, Russia is likely to be able to preserve its advantage, but sustaining it will require resources and industrial capacity unless Moscow adapts, secures partners, or resolves geopolitical tensions.

### Key Takeaways:

- Russia is preparing for a prolonged strategic competition in the Arctic, including potential hybrid conflict, and views Western collaboration initiatives as emerging threats to its dominance.
- Russia's icebreaker fleet is the core enabling asset of its Arctic strategy, allowing economic activity, year-round transport, military mobility, and state presence in the High North.
- Moscow treats icebreakers as multidomain tools - commercial, diplomatic, and military - rather than mere support vessels, integrating them into national security, industrial policy, and foreign influence.
- Post-2022 sanctions have strained Russia's ability to maintain technological superiority, increasing costs, slowing production, and exposing supply chain and workforce vulnerabilities.
- While Russia is likely to retain near-term advantage, long-term strategic leadership depends on its economic resilience, sanctions relief, and the ability of competitors to mobilize their industrial capacity.



## Introduction

Russia's contemporary Arctic strategy is anchored in the premise that the High North remains one of the very few remaining geographic spaces where Moscow can sustain great-power status. Unlike other regions where its influence has contracted, the Arctic continues to offer Russia structural advantages rooted in geography, legacy industrial capacity, and a historically unparalleled fleet of ice-class vessels. These factors position icebreakers not simply as industrial products but as strategic multipliers that enable economic activity, political signaling, and military logistics across a rapidly evolving region. In this context, the Arctic contributes not only to the Russian economy but also to the narrative that the country remains a "sovereign Arctic power" whose capabilities distinguish it from competitors. This research treats icebreakers as a multidomain capability. Their strategic value spans five interdependent vectors: demographic presence, military access and mobility, Arctic R&D and technological signaling, resource extraction and trade, and foreign policy projection. Therefore, it would be not an exaggeration to argue that for Russia icebreakers are emerging as the keystone asset that links economic planning and national security with diplomatic ambition.

This paper is built around four research questions:

- What role(s) does Russia ascribe to various classes of icebreakers in strengthening and expanding its role in the Arctic?
- What are the main strengths of Russian icebreakers and to what extent could these be undermined/diminished given post-2022 transformations?
- Given negative external developments for Russia - including Russia's loss of access to technologies and construction sites in the EU (Finland) - how does Russia plan to address these challenges, and how effective are these measures likely to be?
- What is Russia's view on the measures that have been taken by the West to diminish Russia's competitive edge in the domain of icebreakers?

The novelty of this report lies in conceptualizing "icebreaker diplomacy" as a field in which industrial capacity becomes a tool of international influence. This framework moves beyond traditional evaluations of fleet tonnage or naval procurement to address how Russia uses icebreakers in statecraft in shaping shipping norms, negotiating market access, and contesting infrastructures of Arctic governance.



## Icebreakers in Russia's Arctic Strategy

### Russia in the Arctic: Continuity and Tradition

Following the dissolution of the USSR in 1991, Russia's presence in key regions of the international system declined markedly, and its influence in Africa, Latin America, and the Greater Middle East is no longer comparable to that exercised by the Soviet Union. Perhaps the only region of critical geostrategic importance where Russia still enjoys comparative advantage and acts as the strongest power is the Arctic region. This continued dominance rests on four interrelated pillars: economic, demographic, military, and in terms of soft power.

From an economic perspective, Russia remains the principal beneficiary of Arctic natural resources that constitute up to 20 percent of the country's GDP.<sup>1</sup> The Arctic zone plays a critical role in Russia's energy exports, industrial development, and long-term economic planning, thereby reinforcing Moscow's strategic interest in the region.

Demographically, despite long-term population decline<sup>2</sup> and structural challenges, Russia's Arctic territories remain more densely populated than those of all other Arctic states combined. This demographic presence provides Russia with a significant advantage in terms of infrastructure development, labor availability, and permanent settlement, all of which strengthen its claims and influence in the region.

In military terms, Russia's Arctic dominance is currently evident both quantitatively and qualitatively. The country maintains the most extensive network of military bases, airfields, and naval facilities in the High North, supported by advanced capabilities such as icebreaker fleets, air defense systems, and dual-use infrastructure. These assets enable Russia to project power and secure its strategic interests along the Northern Sea Route (NSR), the state-promoted international transportation artery.

Finally, in the sphere of soft power and governance, despite its de facto (likely temporary) exclusion from the Arctic Council (AC), Russia continues to be perceived by many experts as an indispensable actor in Arctic governance and regional stability. Its historical experience, scientific expertise, and logistical capabilities make sustained cooperation with Russia difficult to replace.

Russia's ability to retain these advantages is underpinned by one critical unifying factor: continuity and tradition in its Arctic policy. Regardless of fluctuations in economic performance, military capacity, political leadership, or the state of relations with the West, Russia's Arctic strategy has consistently prioritized long-term presence, technological superiority, and infrastructural development. In particular, the maintenance of a technological edge – manifested in Russia's dominance in icebreaker capabilities – has traditionally been regarded by the ruling elite as a fundamental prerequisite for securing other forms of dominance in the Arctic, regardless of ideological orientation or external political circumstances.

At this juncture, one of the factors supporting Russia's bid for regional leadership is its technological superiority, most notably reflected in its ability to maintain the world's largest fleet of icebreakers.<sup>3</sup> This capability enhances Russia's capacity to navigate the Arctic and to sustain an adequate level of connectivity among its territorial components.

### The Role of the Soviet Legacy in Russia's Contemporary Arctic Leadership

Russia's current dominance in the realm of icebreaker capabilities traces back to the pre-1917 interim and early Soviet period when its role – as one of the main enabling factors for regional leadership – was



first recognized.<sup>4</sup> Between 1864 and 1899, the Imperial Russian government, drawing extensively on Western technologies and engineering expertise, laid the foundations for its emergence as a global leader in the development of icebreaker fleets, thereby paving the way for subsequent Soviet technological dominance in this sector.<sup>5</sup> Later, despite enormous economic hardships and social-political turbulence, the USSR (established in 1922) cast its eye on the Arctic and de-jure demanded international recognition of its privileged role in the region as early as 1926, when the Soviet Union declared all lands and islands located within its Arctic sector up to the North Pole to be an integral part of its state territory.<sup>6</sup> In 1932, the Main Directorate of the Northern Sea Route (*Glavsevmorput*)<sup>7</sup> was established, which repeatedly emphasized that the icebreaker fleet is an instrument of national development and security.<sup>8</sup>

At this juncture, it is important to note that throughout the Soviet history - and particularly in the 1960s-1980s, which marked the zenith of the Soviet military-political, economic and demographic strength and global influence - its strategic documents maintained the need to have an icebreaker fleet superior to that of any potential adversary.<sup>9</sup> Thus, in pursuit of Arctic dominance and viewing the expansion of icebreaker capabilities as one of its key preconditions, the Soviet Union adopted a development model fundamentally different from that of Western states. While in Western countries icebreaker construction was largely driven by private shipping interests and commercial demand, the USSR relied on a highly centralized approach based on five-year plans, in which the public sector played a dominant role. Under this model, it was the state that allocated large-scale investments in shipbuilding facilities - characterized by exceptionally high fixed costs unattainable for the private sector alone - mobilized scientific and engineering expertise, and prioritized the mass production of icebreakers.<sup>10</sup>

As a result of this strategic emphasis on icebreakers as a core instrument of Arctic competition, the Soviet Union had already emerged as the world's leading power in diesel-electric icebreaker construction by the period between the 1930s and the 1950s.<sup>11</sup> The period spanning the 1970s and 1980s marked the Soviet Union's decisive breakthrough in icebreaker development, representing not merely an incremental enhancement of its competitive advantages but a qualitative leap forward. Following the introduction of the Arktika-class nuclear icebreakers, a Soviet-built vessel became the first surface ship in history to reach the North Pole in 1977, thereby cementing the USSR's technological leadership in Arctic navigation.

To understand the Soviet Union's ability to achieve and sustain global leadership in the development of its icebreaker fleet - an experience that is instrumental for interpreting Russia's current Arctic policies, its willingness to pursue long-term ambitions in the region, and its capacity to reproduce the Soviet developmental model - three key factors must be considered.

First, adaptability of the Soviet centrally planned economic model, which - despite serious structural macro-economic deficiencies and a general lack of flexibility showcased in other sectors - successfully combined domestic technological-industrial potential and a vast resource base<sup>12</sup> with Soviet foreign partnerships.<sup>13</sup> It is also important to note that the concentration of icebreaker production within specialized industrial clusters provided the Soviet side with several critical advantages: accelerated learning curves; standardized designs and streamlined access to large, relatively easily replaceable stocks of spare parts; and a substantial pool of qualified labor, which constituted one of the key production inputs.<sup>14</sup> Notably, the post-1991 Russian state managed to preserve this competitive advantage until 2022, when, as will be discussed later, it was significantly undermined.

Second, the Soviet approach was characterized by a strategic commitment to dominance regardless of the costs involved. Unlike Western countries, where private firms are traditionally guided by economic sustainability and profitability as core operational principles, the Soviet system once again demonstrated a willingness to allocate substantial financial resources in pursuit of clearly defined geopolitical objectives,<sup>15</sup> even when this came at the expense of economic efficiency and commercial returns. In this



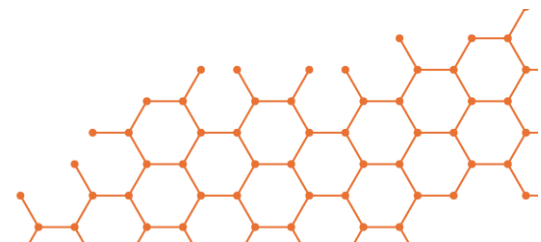
sense, construction of costly icebreakers became an integral part of the Soviet prestige-seeking strategy, which over time evolved into the “myth of the North” becoming a part of Soviet identity whose initial construction traces back to the Stalin era<sup>16</sup> and was later revived, albeit in a different way and for a different purpose, during the Yuri Andropov reign.

Third was a combination of military-strategic and geoeconomic considerations, which is highlighted extensively in Russian scholarship discussing the dual logic of Trans-Arctic flow and operations.<sup>17</sup> Icebreakers were therefore seen not merely as “civilian” vessels but multifunctional instruments that played a critical role in advancing the Soviet Union’s broader strategic objectives in the Arctic. They ensured the protection and reliability of northern supply lines, particularly in remote and climatically hostile regions where alternative transport options were limited or nonexistent. At the same time, icebreakers significantly enhanced naval mobility and operational access, enabling both surface and auxiliary forces to operate in ice-covered waters for extended periods. Ultimately, by facilitating year-round navigation and logistical support, icebreakers underpinned a sustained strategic presence along the Soviet maritime part of the Arctic, reinforcing territorial control and strengthening the Soviet regional posture.

Moreover, the aforementioned dual-use nature of icebreakers translated into a distinctly Soviet tradition – in fact, the foundations should once again be traced to the pre-1917 period – of equipping certain classes of icebreakers with various types of weaponry and military equipment, thereby effectively introducing a distinct class of militarized icebreakers (*bojevyje ledokoly*). Employment of these military-logistical vessels strengthened Soviet control over Arctic maritime lines of transportation, provided convoy protection, and enhanced the resilience of northern maritime routes under wartime conditions.<sup>18</sup>

Taken together, the historical, institutional, and strategic trajectories outlined above demonstrate that Russia’s current global leadership in icebreaker capabilities is neither accidental nor purely a product of post-Soviet policy choices. Rather, it is deeply rooted in a Soviet legacy that combines long-term strategic vision, state-led industrial mobilization, and the systematic integration of technological, military, and geoeconomic objectives in the Arctic. The Soviet Union not only created the world’s most extensive and technologically advanced icebreaker fleet but also embedded icebreakers into a broader logic of Arctic domination, where infrastructure, security, prestige, and territorial control were mutually reinforcing. Contemporary Russia has inherited not only material assets – such as shipbuilding expertise, nuclear icebreaker technologies, and industrial clusters – but also a strategic mindset that treats icebreakers as a decisive instrument of competition in the High North. As a result, Moscow’s present-day dominance in icebreaking capabilities represents a direct continuation of Soviet-era path dependencies, confirming that the Soviet legacy remains a central pillar of Russia’s ability to project power, secure influence, and sustain strategic competition in the Arctic region.

In the 1990s Russia’s icebreakers industry – both the fleet itself and shipyards specializing in manufacturing icebreakers and its critical components – experienced hardships caused by a combination of underfinancing and shifting priorities of the Russian state, which was wrestling with internal challenges.<sup>19</sup> Yet, this decline turned out to be a relatively short-lived experience: due to the consolidation of nuclear icebreaker operations around FSUE Atomflot – which enabled the industry to retain centralized operational governance, preserve unique know-how, and avoid privatization<sup>20</sup> – and ensuing macroeconomic stabilization (starting from 1999), the industry managed to avoid collapse. Already in the early 2000s, concurrent with the reactivation of the Northern Sea Route (NSR) project, icebreakers were systematically incorporated into Russia’s strategic maritime doctrines and planning documents. This institutionalization marked a clear policy shift: the Arctic was once again defined as a zone of core national interest, while icebreakers were elevated from auxiliary transport assets to a primary instrument of state power, enabling Russia to translate strategic intent into sustained operational presence and competitive advantage in the High North.



## The Role of Icebreakers in Russian Strategic Documents Across the Putin Era

Icebreakers – as a critical component of Russia’s ability to maintain its role as the dominant Arctic player – began to appear in the Kremlin’s strategic documents from the very start of Vladimir Putin’s first presidential term (2000–2004). However, they were not treated as a separate policy area, instead, they emerged within the broader context of reviving the NSR as part of Russia’s multidimensional strategic national interests<sup>21</sup> and as a factor of revival of Russia’s economic power<sup>22</sup> and restoration of the country’s posture as a global actor.<sup>23</sup> Meanwhile, from the early 2000s onward, the Arctic region – and Russia’s ability to maintain control over the NSR and navigation along it – began to reassert itself in military-political and security discourse. Over time, it emerged as a significant component of Russia’s national security priorities.

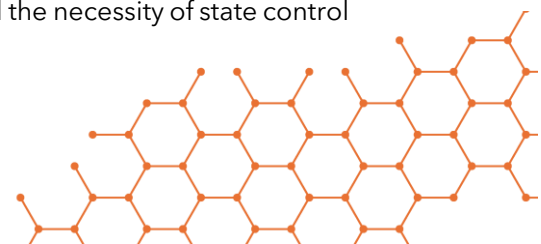
For example, during this period, Russian defense and security experts increasingly linked the NSR to Arctic security in their writings, framing it as an instrument of Russia’s strategic control over the region.<sup>24</sup> Overall, the re-entry of icebreakers into Russia’s key strategic documents and doctrinal frameworks during the Putin era (2000–2025) did not occur all at once, but rather unfolded gradually across three distinct stages, reflecting broader shifts in Russia’s strategic thinking, Arctic policy priorities, and evolving perceptions of the region’s military, economic, and geopolitical significance.

During the first stage (2000–2006), icebreakers were mentioned in Russia’s strategic documents as a facilitating factor in the country’s reassertion as a maritime power with global ambitions. At this juncture it makes sense to note that the first post-Soviet doctrinal re-entry of the Arctic occurs through maritime strategy rather than as a dedicated Arctic strategy. The Maritime Doctrine for the period to 2020 (adopted in 2001) reasserts the NSR as a national transport communication.<sup>25</sup> The doctrine explicitly identified the need to preserve global leadership in the construction and operation of nuclear-powered icebreakers as a long-term objective and a critical element in the functioning of the NSR.

Although the document did not frame the development of icebreaker capabilities explicitly in defense or security terms, it nonetheless implied that Russia’s ability to maintain effective control over its resource-rich yet sparsely populated and geographically remote Far East depends on sustaining uninterrupted connectivity with the region, including through maritime transportation. This requirement was presented as particularly important in light of the intensive economic and military development of neighboring states in the Asia-Pacific region – clearly, China was implicitly mentioned – which were described as a factor “exerting a very substantial influence on economic, demographic, and other processes in the region”. It is important to note that although icebreakers appeared to play a mere auxiliary role, from the early 2000s onward the icebreaker component was institutionally embedded in the agenda of Russia’s national interests in the Arctic through the NSR and mechanisms of infrastructural and state control.

During the second stage (2007–2014) – which manifested the beginning of the breakdown of Russo-Western ties in their post-1991 format – the Arctic region started to evolve into an arena of tacit geopolitical powerplay between Russia and its Western counterparts. Russia’s approach to the Arctic as its privileged zone of interest became abundantly clear in 2007, following the extremely provocative “Arktika-2007” expedition, which enraged other Arctic countries.<sup>26</sup> Notably, 2008 marked a critical milestone in the formation of the perception of the NSR as a factor of the Russian Federation’s national and military security, following the adoption of the document “Fundamentals of the State Policy of the Russian Federation in the Arctic for the Period up to 2020 and Beyond”<sup>27</sup>.

Also important is the fact that the 2008 document became the first official act in which the NSR was explicitly incorporated into Russia’s system of national interests in the Arctic and directly linked to ensuring the protection of Russia’s sovereignty. The document emphasized the necessity of state control



over Arctic communications, the development of dual-use infrastructure, and the maintenance of a permanent Russian presence in the region. In this way, the NSR was institutionally framed not merely as an economic corridor, but as an object of strategic significance subject to state protection. Within this framework, icebreakers – along with “emergency, rescue and support vessels, as well as coastal infrastructure” – played an implicit yet strategically important role, functioning as enabling instruments rather than as an independent policy domain.

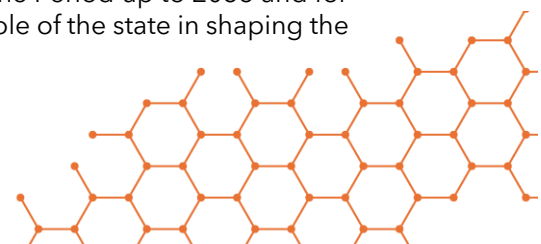
Between 2013–2014, other normative-legislative acts upgraded the role of icebreakers as a critical supporting tool of Russia’s domination in the Arctic. For instance, the creation of the NSR Administration and the adoption of navigation rules for the NSR water area formalized state authority over access procedures, safety requirements, ice pilotage, and icebreaker escorting services.<sup>28</sup> This shift matters for icebreakers in two ways. First, it codifies demand: escorting and information services become embedded in regulation, which implies baseline capacity. Second, it creates a planning interface: icebreaking becomes part of a managed system of permits, routing, and safety standards, not an ad hoc operational workaround. Subsequently, with transformation of the Northern Fleet into a Joint Strategic Command (2014)<sup>29</sup> and adoption of the renewed Maritime Doctrine to 2030 (2015)<sup>30</sup> Russia’s icebreaker fleet – in particular, nuclear-powered icebreakers – became an implicit symbol of Russia’s ability to operate independently in extreme environments and to assert its status as a dominant Arctic maritime power.

During the third stage (from 2020 to the present) the role of icebreakers in Russia’s strategic documents and doctrines has evolved further, featuring three trends.

First, as outlined in the 2020 Executive Order on the “Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035,”<sup>31</sup> the construction of icebreakers is framed not merely as a technical or logistical necessity, but as a critical strategic priority for the Russian state. The document explicitly identifies delays in icebreaker development and production as a key bottleneck capable of constraining the implementation of Russia’s broader Arctic agenda. In this context, icebreaker shortages are portrayed as a systemic vulnerability: without sufficient and timely icebreaker capacity, Russia’s ambitions in the Arctic – ranging from economic development and energy extraction to maritime transport and military presence – risk being significantly undermined. Consequently, shortcomings in this sector are elevated beyond the realm of industrial planning and treated as a direct threat to national security, underscoring the central role of icebreaker construction in sustaining Russia’s long-term Arctic strategy.

Second, the Maritime Doctrine of the Russian Federation (2022)<sup>32</sup> consolidates this approach. For example, the Doctrine – which explicitly lists icebreaker vessels within the category of specialized state maritime fleets alongside search and rescue and environmental protection vessels – includes the development of icebreaker fleets in the list of Russia’s national maritime priorities in the Arctic theater. It is also important to stress that the document highlights a doctrinal shift toward civil-military synergy in the Arctic maritime domain, including the use of civilian icebreakers for broader security tasks: specifically, it envisions civilian vessels (icebreakers) supporting military operations, with the potential for modular capabilities and integration into broader defense logistics.<sup>33</sup> Furthermore, echoing the pre-1991 period – when icebreaker production constituted a core component of the Soviet industrial and technological base – the document articulates a policy agenda aimed at fostering favorable conditions in Saint Petersburg, as well as in the Kaliningrad and Leningrad regions, for the development of icebreaker fleets, including both nuclear-powered and diesel-electric vessels. The expansion of this sector is positioned as a key pillar of regional economic specialization within the broader strategic framework.

Third, the “Strategy for the Development of the Shipbuilding Industry for the Period up to 2036 and for the Long-Term Perspective up to 2050”<sup>34</sup> (2025) underscores the central role of the state in shaping the



trajectory of Russia's shipbuilding sector. The document explicitly frames government demand as the primary driver of industrial development, with state orders directed toward vessels for national defense, scientific research, emergency and rescue operations, and, critically, the nuclear icebreaker fleet. In this model, public procurement functions not only as a tool of capacity utilization but also as a mechanism for technological upgrading and long-term industrial coordination.

Within this broader framework, the icebreaker segment occupies a distinctive strategic position. The strategy highlights that icebreaker construction demonstrates the lowest level of import dependence across the shipbuilding industry, with domestically produced components accounting for over 60 percent of total inputs. This comparatively high degree of localization positions icebreakers as one of the flagship success stories of Russia's import substitution policy, particularly in the context of sanctions and constrained access to foreign technologies. As a result, the development of both nuclear-powered and diesel-electric icebreakers is presented not merely as a response to operational needs in the Arctic, but as a cornerstone of industrial resilience, technological sovereignty, and state-led innovation within Russia's long-term shipbuilding strategy.

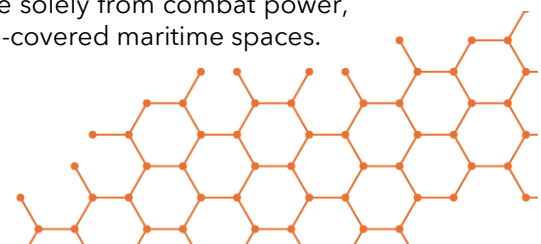
In the final analysis, one could argue that Russia's contemporary Arctic posture is best understood through the lens of continuity and tradition. Despite the profound geopolitical, economic, and institutional transformations that followed the dissolution of the Soviet Union, the Arctic has remained a space of sustained strategic prioritization in Russian statecraft. Unlike in other regions where post-Soviet retrenchment significantly curtailed Moscow's influence, the Arctic continues to represent an area of comparative advantage underpinned by a unique combination of economic resources, demographic presence, military infrastructure, and governance capacity. Central to this enduring position is Russia's ability to translate long-term strategic intent into material capabilities – most notably through its dominance in icebreaker technologies.

Assessing Russia's vision of icebreakers as one of the key factors of its regional domination, it should be noted that icebreakers have occupied a dual role in both Soviet and subsequently post-1991 Russian Arctic policy, acting as practical enablers of navigation, connectivity, and resource development, and as symbols of technological prowess, state capacity, and territorial control. This legacy, forged through centralized planning, sustained public investment, and the integration of civilian and military objectives, has been largely preserved in the post-1991 period, which is clearly visible through a survey of Russia's key strategic Arctic-related doctrines and documents that emerged during Putin's reign over Russia.

Recent strategies further elevate their importance by linking icebreaker construction to import substitution, technological sovereignty, and long-term regional specialization. As a result, icebreakers now occupy a pivotal, albeit less pronounced from a legislative point of view, position at the intersection of economic development, military logistics, and state prestige-seeking. This strategic centrality provides the foundation for examining how Russia employs icebreakers not only as functional instruments, but also as tools of influence, signaling, and competition. The following section therefore turns to icebreakers as a key mechanism through which Russia seeks to secure resources, shape regional norms, and assert its status as the leading Arctic power.

## Conceptualization of the “Icebreaker Diplomacy” Term

This study views the term “icebreaker diplomacy” as a form of strategic history-based infrastructure statecraft in which industrial capabilities are deliberately mobilized to generate (geo)political influence, soft power, economic leverage, and security advantages in a geographically challenging but geo-strategically pivotal environment. In this study I argue that unlike traditional naval power, icebreakers occupy a hybrid position at the intersection of civilian logistics, military enablement, and symbolic state presence. It is also critical to acknowledge that their value does not derive solely from combat power, but from their capacity to structure access, mobility, and governance in ice-covered maritime spaces.



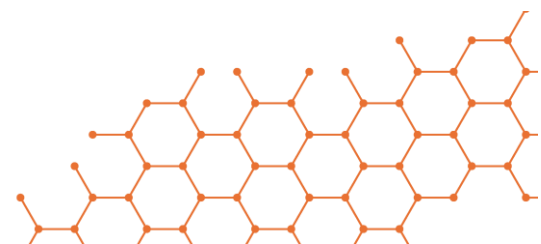
Within the Arctic context, icebreakers function as an integral part of “enabling infrastructure” that conditions the feasibility of nearly all other forms of activity ranging from resource extraction and maritime trade to scientific research, military logistics, and international cooperation. Control over icebreaking capacity therefore translates into the ability to regulate movement, set operational norms, and shape the practical implementation of legal and regulatory regimes, particularly along the NSR. In this sense, it would not be an exaggeration to argue that icebreakers do not merely support Russia’s Arctic strategy – despite occupying a less explicit and direct role in its agendas – they actively constitute it.

Building on insights from infrastructure power, geoeconomics, and security studies, this paper treats icebreakers as a multidomain capability whose strategic utility manifests across five interrelated vectors:

- Demographic presence and territorial consolidation.
- Military access, mobility, and logistical endurance.
- Technological signaling – which goes well beyond Arctic-specific research and development – which also pertains to Russia’s position as a one of the global leaders in nuclear power.<sup>35</sup>
- Resource extraction and trade facilitation.
- Foreign policy projection through norm-shaping, service provision, and selective cooperation.

Therefore, it is important to note that “icebreaker diplomacy” refers to the ways in which the Russian state leverages its icebreaker fleet not only to secure economic and security objectives, but also to influence the behavior of other actors by structuring their dependence on Russian-controlled infrastructure. Escort services, navigation regulation, emergency response, and access to year-round Arctic transit function as instruments through which Russia can grant, condition, or restrict participation in Arctic maritime activity without resorting to overt coercion. This mechanism is particularly salient in the contemporary Arctic, where legal ambiguity, extreme environmental constraints, and limited alternative infrastructure amplify the strategic weight of operational control.

By adopting this framework, the paper moves beyond conventional assessments focused on fleet size or vessel specifications. Instead, it analyzes icebreakers as tools of competitive statecraft, embedded in long-term industrial policy, strategic planning, and geopolitical signaling. This approach allows for a more nuanced evaluation of Russia’s Arctic posture – one that accounts not only for material capabilities, but also for how those capabilities are translated into influence under conditions of heightened geopolitical rivalry and infrastructural scarcity.



## The (New) Scramble for the Arctic and the Role of Icebreakers

Despite repeated Western efforts to frame the Arctic as a zone of peaceful cooperation and mutually beneficial economic engagement,<sup>36</sup> Moscow has consistently approached the region through a confrontational strategic lens. From the Russian perspective, the Arctic has never constituted a genuine “territory of peace”. As Russian historical and military thought has long maintained, competition in the High North is cyclical rather than episodic, a struggle that may temporarily subside, but never fully disappears, instead re-emerging across successive historical periods.<sup>37</sup> Russia’s underlying intentions and limited willingness to cooperate in the Arctic became fully explicit following the launch of its full-scale military aggression against Ukraine in February 2022. Since then, official Russian discourse has increasingly normalized the prospect of confrontation with NATO in the European theatre, including its Arctic dimension. The Russian Ministry of Defence has openly assessed the risk of a military conflict with NATO within the next decade,<sup>38</sup> while senior political leadership has articulated Russia’s readiness to defend its Arctic interests across multiple dimensions.

In this context, Foreign Minister Sergey Lavrov has emphasized Moscow’s preparedness to act militarily, politically, and technologically, citing what Russia perceives as NATO’s escalating exercises and crisis-response scenarios in the Arctic.<sup>39</sup> Although a large-scale, high-intensity armed conflict between Russia and NATO in the Arctic – employing the full spectrum of available military capabilities – remains unlikely in the short-to-medium term, Russian strategic thinking does not exclude alternative forms of confrontation. Rather, Moscow appears to prioritize escalation management below the threshold of open warfare, consistent with broader patterns observed in Russian military doctrine and political practice. These include hybrid, coercive, and signaling-based approaches designed to assert control, deter adversaries, and impose costs without triggering direct military confrontation. Accordingly, Russian military planning increasingly focuses on identifying escalation pathways, operational scenarios, and courses of action specific to the Arctic theatre. In this framework, confrontation is not necessarily conceived as a discrete military clash, but as a protracted multidomain competition in which political pressure, economic leverage, infrastructural control, and selective military instruments are employed to secure strategic advantage under conditions of heightened tension.

### Russia’s Perception of the Scramble for the Arctic

From the Russian strategic viewpoint, the Arctic is increasingly conceptualized not merely as a zone of economic opportunity or symbolic prestige, but as a potential battlefield whose unique characteristics fundamentally shape the nature of future conflict. Russian military and analytical literature sources consistently view the High North as a distinct theatre of (potential) conflict requiring specialized capabilities, and modes of warfare. Accordingly, three interrelated dimensions dominate Russian thinking on Arctic conflict: the impact of geography and climate, the management of structural vulnerabilities – both Russian and Western – and the anticipation of escalation dynamics in the region.<sup>40</sup>

First, geographically, Russian military experts define the Arctic theatre of war as the space above the Arctic Circle (66°33’ N), encompassing surface, subsurface, air, and space domains. Climate and geography are identified as the primary macro factor shaping combat operations. Extreme weather conditions, prolonged ice coverage, permafrost terrain, low radiation balance, and long coastlines combine to produce an environment that sharply constrains mobility, logistics, and force deployment. These conditions elevate the importance of Arctic-tailored military equipment, specialized combat gear, and uninterrupted year-round logistical support, while penalizing actors lacking such capabilities. As a result, operational success is framed as contingent on the possession of purpose-built platforms – particularly ice-capable vessels – and the ability to sustain forces in isolated and hostile conditions.



Second, in terms of the ethnographic and socio-economic fragility of the Arctic macro-region, Russian authors note the absence of an integrated industrial base and the region's dependence on supply chains extending from the mainland, which exposes critical logistical vulnerabilities. Additionally, low population density, a complex ethnic composition, and strained relations with Indigenous communities are viewed as potential sources of instability during a hypothetical regional crisis involving so-called external threats. While Russian experts highlight the tactical value of Indigenous knowledge for survivability and special operations, they also display reluctance to rely on Indigenous formations militarily, reflecting concerns over loyalty and demographic depletion.

Third, Russian specialized literature allocates the central role of engineering troops and specialized infrastructure. Russian military literature underscores that control over the NSR, the resilience of land-based infrastructure, and the denial of maneuver space to adversaries depend on fortifications, prepared aerodromes, engineered routes, and non-explosive barriers adapted to Arctic conditions. Engineering capabilities are thus treated as a decisive enabler of both defense and operational mobility.

Beyond these structural factors, Russian analysts emphasize the psychological and systemic fragility of Arctic operations.<sup>41</sup> The extreme environment heightens stress, increases the probability of error, and amplifies the effects of information warfare and cyber disruptions. Of particular concern is the so-called cascade amplification mechanism (*kaskadnyje mekhanizmy usilenija*) whereby minor incidents can rapidly trigger systemic breakdowns in command and control due to poor connectivity and vast distances.

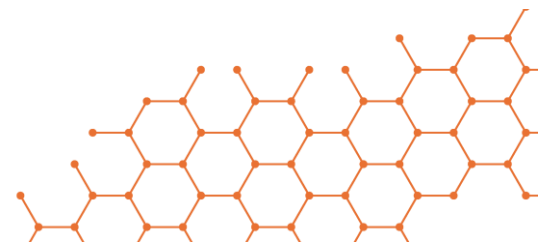
It is also important to analyze, first, how Russian defense and military specialists perceive the ongoing "scramble for the Arctic" from the point of view of the actors involved. For example, one study published in the ultra-conservative and influential magazine *Arsenal Otechestva* identified five "circles" of rivalry and cooperation in the Arctic.<sup>42</sup> First, the struggle for the resources of the Far North involves the states bordering the Arctic – Russia, the United States, Canada, Denmark, and Norway. These countries, which have coastlines on the Arctic Ocean, possess preferential rights to develop Arctic resources. The United States, seeking to maintain global leadership, builds its Arctic policy on unilateral actions and on ignoring international institutions that are not fully under its control. Today, the U.S. is more interested in the Arctic than ever before. Washington sees how many resources, including military ones, Russia is investing in the Arctic. The Pentagon has declared that the United States is ready for a battle with Russia for the Arctic.

Second, there are the near-Arctic states which, while lacking direct access to the Arctic Ocean, are in close proximity to the Polar Circle (Iceland) or have territory within the Arctic zone (Sweden and Finland). On this basis, they were included in the Arctic Council (AC) and the Barents/Euro-Arctic Council (BEAC).

Third, international organizations of Western countries (NATO, the European Union, and organizations of the Nordic states) have also recently become actively involved in Arctic affairs.

Fourth, the UN and its specialized agencies – the Commission on the Limits of the Continental Shelf (CLCS), the United Nations Environment Programme (UNEP), the International Maritime Organization (IMO), UNESCO, and other organizations – attempt to "stand above the fray" and operate in the Arctic in the interests of the entire global community, as well as serve as arbiters in disputes among Arctic "players."

In addition to these four, a rapidly emerging fifth "circle" of cooperation-competition around the Arctic has appeared – namely, non-Arctic states (primarily East Asian countries, as well as a number of European states). This inevitably leads to heightened economic and political contradictions in the region, since the legal regime of the Arctic in several cases does not allow for clear delimitation even between the "official" Arctic powers.



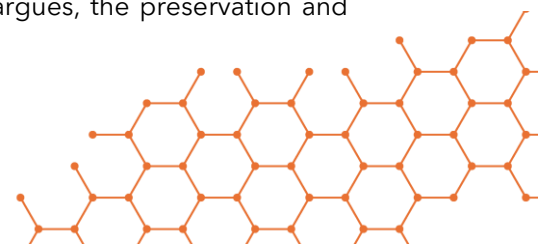
Despite acknowledging internal vulnerabilities, Russian experts generally assess Russia's Arctic posture as superior to that of NATO, particularly by exploiting perceived Western weaknesses. These include NATO's limited icebreaker capabilities and Russia's asserted advantages in hypersonic and coastal missile systems. For example, Russian military expert Dmitry Litovkin has argued that Russia's use of the Kh-47M2 Kinzhal hypersonic air-launched ballistic missiles and the K-300P Bastion-P mobile coastal defense missile systems (equipped with the P-800 Oniks supersonic anti-ship missiles) could pose an insurmountable challenge for NATO aircraft carriers and frigates.<sup>43</sup> However, Russian analysts increasingly argue that the primary threat lies not in direct military confrontation, but in network-centric destabilization strategies targeting political, economic, infrastructural, informational, and social domains. Such measures, in their view, aim to induce strategic paralysis before any overt military phase, positioning the Arctic as a critical front in a broader systemic competition rather than a conventional battlefield alone.<sup>44</sup>

Against the backdrop of structural changes in contemporary warfare – particularly the growing salience of economic sustainability, logistics, and infrastructure as determinants of military power – Russian strategic thought treats the Arctic as a distinct operational environment shaped by severe climatic conditions and pronounced socio-demographic and economic constraints.<sup>45</sup> Within this context, Russian military doctrine and expert literature delineate three principal operational domains, or “battlefields,” as central to Arctic conflict: land, maritime, and air. Analytical attention is consequently directed toward assessing how these domains interact under Arctic conditions and toward identifying the strategies, force postures, and instruments through which Russia seeks to counter and constrain the capabilities of potential adversaries. In the post-2022 period, Russian military experts have started paying greater attention to the maritime aspect as an Arctic operational theater, where NATO (and the U.S. in particular) is playing a catch-up game with Russia being ahead. Russian works have rephrased a famous statement by Halford Mackinder into “[W]ho rules logistical hubs in the Eurasian Arctic commands the fate of the world”<sup>46</sup> which intensifies geopolitical rivalry and makes the risk of regional conflicts more palpable than before.

In assessing Russia's position in the Arctic as superior to that of NATO (or any other country or organization), Russian analysts frequently point to icebreakers as a critical enabling capability. Icebreaker fleets are portrayed as essential instruments for maintaining connectivity across Russia's extensive Arctic coastline, thereby ensuring operational cohesion among geographically dispersed regions. They are also viewed as indispensable for sustaining the uninterrupted flow of Arctic natural resources to Asian markets, one of the key sources of Russia's hard-currency revenues. In addition to these geoeconomic functions, icebreakers perform a range of vital auxiliary tasks, including search and rescue operations and logistical support in extreme conditions. Moreover, as will be demonstrated later in this report, Russian military literature increasingly acknowledges that, under certain circumstances, icebreakers may assume a more direct role in hostilities, further reinforcing their strategic significance within Russia's Arctic posture.

## **Russia's Icebreaker Fleet: Types/Classes, Roles, Areas of Employment, and Application**

Russian experts view a potential Arctic confrontation – which, as argued earlier, some believe has already begun in the form of hybrid warfare against Russia – as a multidimensional contest that is unlikely to unfold through conventional military means. From a policy perspective, this implies that Russia's ability to succeed in the Arctic will depend on maintaining superiority across four closely interrelated domains: military power; economic and transportation capacity (including logistics in challenging Arctic conditions); technological capability; and informational-psychological confrontation including promoting Russia's image and soft power. As this section of the paper argues, the preservation and



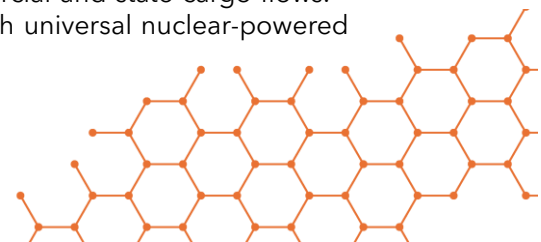
further development of Russia's competitive edge in icebreaker capabilities constitutes a critical policy lever that – albeit to varying degrees – directly affects performance across all four domains. Russia's icebreaker fleet is not primarily a combat instrument but a force-multiplying infrastructure capability that enables freedom of maneuver, persistence, and escalation control in the Arctic theater. Russian strategic discourse increasingly frames Arctic competition as multidimensional and hybrid in nature, privileging logistics, infrastructure, and technological superiority over conventional military confrontation.<sup>47</sup>

In Russian specialized literature, an *icebreaker* is defined as an “auxiliary ice-navigation vessel designed to support and extend navigation in freezing waters, to break ice cover, and to ensure the movement of other vessels”. This definition emphasizes the functional purpose of an icebreaker: it is not merely a vessel with a reinforced hull or enhanced ice-going capability, but one whose primary role is to ensure navigability and to provide assistance to other ships. In this sense, an icebreaker constitutes a distinct vessel type with a dedicated icebreaking function, rather than simply a ship capable of operating in icy conditions.<sup>48</sup> Unlike icebreakers, other types of ice-class vessels (such as Arc7 or Polar Class ships) are constructed with reinforced hulls and equipped for operations in ice-covered waters, but they are not specifically designed to break ice as their primary function. Such vessels are capable of operating in Arctic conditions; however, their principal purpose is the transportation of cargo, rather than the systematic creation of navigable channels for other ships. Within the scope of this analysis, explicit reference will therefore be made only to icebreakers and their use by Russia, and not to other categories of ice-class vessels.

A. Icebreakers designed to perform (predominantly) civilian-oriented missions. From a propulsion and operational perspective, icebreakers may be classified into two main categories.

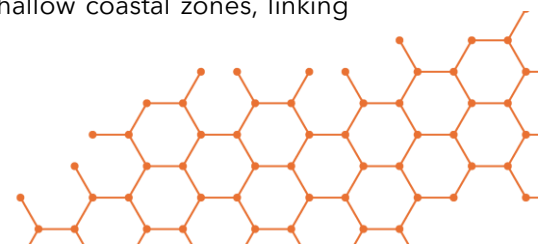
First, nuclear icebreakers that could be further sub-divided into the following classes.

- **Project 10510** (Lider / LK-120Ya) represents Russia's most ambitious icebreaking initiative to date. Designed with an estimated shaft power of ~120 MW, Lider-class vessels are intended to escort wide-beam LNG carriers and other large tonnage ships year-round, including in the eastern NSR irrespectively of climactic conditions or time of the year.<sup>49</sup> It is important to highlight that this extremely costly strategic project – according to open Russian-language sources, the Russian side has allocated funding for 2026–2027 amounting to 52.9 billion rubles (approximately \$670 million USD) based on current exchange rates<sup>50</sup> – reflects three core assumptions in Russian policy. First, Russian planners believe that the need for icebreakers will remain relevant for decades to come; in doing so, they effectively dismiss the implications of climate change and conclude that preserving existing icebreaking capabilities and expanding maximum icebreaker capacity remains a strategic necessity. Secondly, experts believe that pursuit of this strategic project underscores Russia's intent to institutionalize Arctic access advantages rather than rely on seasonal variability.<sup>51</sup> Third, the Russian side appears convinced that, despite the globally declared “green agenda,” there will be sufficient demand for Russian hydrocarbons for many years to come, and that the project will therefore retain its economic sustainability in the future. Overall, as argued by some subject experts, Project 10510 represents another layer of “heavy Arctic infrastructure” that strengthens Russia's geo-economic model of the NSR and indirectly increases its operational freedom in the region.<sup>52</sup>
- **Project 22220** (LK-60Ya, *Arktika* class) constitutes the backbone of Russia's contemporary nuclear icebreaker fleet. These vessels combine high shaft power (~60 MW) with a dual-draft (“universal”) design, allowing operations in both deep Arctic waters and shallow river estuaries. This capability is central to Russia's effort to integrate maritime Arctic routes with inland Siberian logistics.<sup>53</sup> Project 22220 icebreakers were specifically designed (in 2009) to guarantee escort availability along the entire NSR, reducing uncertainty for commercial and state cargo flows.<sup>54</sup> Currently Russia has embarked on the construction of the seventh universal nuclear-powered



icebreaker of Project 22220, "Stalingrad," at the Baltic Shipyard of the United Shipbuilding Corporation (USC) in Saint Petersburg.<sup>55</sup> Based on Russian sources and the technical characteristics of the Project 22220 icebreakers, the Russian side primarily envisages this class as fulfilling (geo)economic functions. These icebreakers are intended to support the NSR traffic management as a core element of Russia's broader NSR services ecosystem, and to directly enable NSR logistics, particularly for hydrocarbon exports to major markets, primarily in the Asia-Pacific (Indo-Pacific) region.<sup>56</sup> Analysis of Russian sources does not provide any conclusive evidence that would allow one to suggest that icebreakers of this class would be used for dual-purpose functions (civilian and military), yet two critical aspects should be considered. First, Russia did have a history of equipping reportedly civilian icebreakers with certain classes of weaponry and military equipment. Second, Project 22220 ships are part of the infrastructure that strengthens Russia's overall Arctic posture, which directly pertains to military and strategic planning.

- **Project 10520/10521** nuclear icebreakers such as *Yamal* and *50 Let Pobedy*, remain operationally relevant – in fact their relevance goes well beyond their strictly operational application – despite their advanced age. They provide surge capacity, training platforms, and institutional continuity during the transition to newer classes.<sup>57</sup> According to Russian-language sources, this class of icebreakers offers three key advantages that enable Russia to sustain and advance its geostrategic ambitions in the Arctic region. First, it was this class of icebreakers that enabled the USSR (and later Russia), to institutionalize its presence and economic activity in a region where dense ice had historically restricted navigation. Russian sources emphasize that the Arktika series made it possible to establish the practice of year-round navigation along certain sections of the NSR – although this class of vessels is unable to secure year-round navigation in the eastern part of the Arctic – and to turn icebreaker support into a predictable service. Altogether, this creates the conditions for implementing an export-oriented resource development model in the Arctic.<sup>58</sup> Second, this class of icebreakers expanded Russia's operational window in the Arctic, providing support for transportation, infrastructure, and search-and-rescue operations. They were also deployed in scientific expeditions, including the symbolic voyage to the North Pole in 1977, which became part of a flag-showing policy and an instrument for legitimizing territorial claims such as the Arktika-2007<sup>59</sup> provocative expedition. At this juncture, it is important to note that icebreakers of this class were not originally designed as military assets; their infrastructure-related functions indirectly enhanced defense capabilities by providing logistical support for northern garrisons and transporting dual-use cargo in the absence of alternative routes.<sup>60</sup> Third, Russia has been using icebreakers of this class as one of the key tools of soft power through Arctic-related international cultural projects. For example, the Rosatom-promoted the "Icebreaker of Knowledge" (*Ledokol Znaniy*) initiative should be mentioned. Launched in 2019, as an educational and foreign outreach initiative, it has become one of the main factors in Russia's attempt to draw international attention to the Arctic through the use of its nuclear-powered icebreakers. Notably, the initiative appears designed to link emerging Russian leaders with peers from the Global South,<sup>61</sup> mirroring Soviet-era strategies of influencing future foreign elites through educational and cultural engagement. By fostering positive associations with Russia – much as the USSR once did – this approach may help secure long-term diplomatic and political dividends, which still remain visible in international organizations and voting alignments.
- **Project 10580** (*Taymyr* class) nuclear icebreakers – far less potent and smaller in size, this class understandably draws considerably less attention in foreign expert analytics than the above-mentioned classes – form a specialized niche characterized by a number of characteristics indispensable for uninterrupted functioning and operability in the Arctic region and High North. Specifically, these vessels are optimized for river estuaries and shallow coastal zones, linking

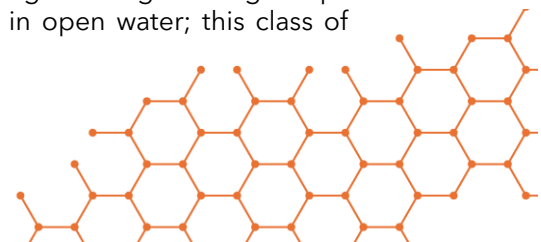


maritime Arctic operations with inland transport corridors.<sup>62</sup> In geo-economic terms, Project 10580 functions as a service and enabling platform designed to ensure the reliable export of output from the Norilsk industrial region and to support the year-round operability of the Murmansk-Dudinka route, long regarded as one of the most critical Arctic transport corridors. Importantly, Russian sources emphasize that its role extends beyond simple escort duties. It encompasses a standardized set of operational capabilities, including vessel berthing and unberthing at port facilities, ice channel guidance in fast ice conditions, and sustained operations under complex and variable ice regimes. Collectively, these functions position Project 10580 as a key infrastructural asset underpinning the resilience and continuity of Arctic logistics rather than merely a tactical icebreaking tool.<sup>63</sup> Therefore, despite their small size, advanced age and existence of other types of icebreakers – including the development of mega projects – Project 10580 icebreakers will preserve their operational importance in the 21<sup>st</sup> century. This is based on the following reasons. First, the growth of Arctic cargo volumes and rising requirements for supply predictability have rendered the shallow-water segment of the NSR critical.<sup>64</sup> Second, Russia was compelled to extend both the service life of these vessels and the operational lifespan of their reactor plants, whereby effectively acknowledging that, without this class, a functional capability gap would emerge until next-generation multipurpose icebreakers are able to assume part of these tasks.<sup>65</sup> Third, Project 10580 is also significant as a technological and organizational bridge. Operational experience with shallow-draft nuclear icebreakers in estuarine zones and depth-constrained waters has been incorporated into contemporary approaches to the development of icebreaking support for the NSR, as well as into the design logic of new icebreaking solutions.<sup>66</sup> Therefore, speaking about the (still remaining) importance of Project 10580 for Russia's Arctic-related ambitions, it should be noted that this class of vessels directly contributes to Russia's ability to maintain internal economic cohesion in the Arctic<sup>67</sup> ensuring the ability to continue operations in the Arctic where large icebreakers are constrained by hydrographic limitations and port-specific characteristics.

Speaking about the vitality of nuclear icebreakers for Russia's Arctic strategy and achieving its national objectives in this vital region, several aspects should be highlighted. On the one hand, technical characteristics of these vessels enable Russia to remain the only Arctic actor capable of integrating maritime and inland Arctic logistics at scale. On the other hand, despite the extraordinary cost of construction of new types of icebreakers, this presents a huge opportunity for the Russian ship building industry since Russia's state corporations (such as the Zvezda corporation) could use the acquired expertise and injection of state funds to additionally start building not only new civilian vessels but also aircraft carriers.<sup>68</sup> In addition to this, it is worth keeping in mind that to Russia's military planners and strategists, especially those leaning towards a more conservative agenda, icebreaker capabilities are inseparable from countering "mounting American ambitions" and U.S. ambitions to increase its presence in the Arctic region and Antarctica, which, as noted in Russian sources, is "*Terra nullius*".<sup>69</sup> Prominent ultra-conservative military expert Captain 1<sup>st</sup> rank (ret.) Konstantin Sivkov has posited that as long as Russia is able to preserve supremacy over the U.S. in terms of icebreakers, it will have the upper hand in the Arctic region.<sup>70</sup>

Second, diesel-electric icebreakers<sup>71</sup> should be seen as Russia's "workhorses" and an auxiliary tool strengthening its overall competitive edge. Unlike the above-mentioned classes of icebreakers, these types of vessels – operated by Rosmorport and regional port authorities – are primarily designed to perform tactical wintertime navigation in freezing ports and coastal waters across Russia's Arctic (partially), Baltic, Far Eastern basins as well in southern parts of the country such as the Volga.<sup>72</sup> Among dozens of still operating diesel-electric icebreakers the following sub-types should be mentioned:

- **Project 21900** (*Moskva* and *Sankt-Peterburg*) icebreakers are capable of navigating through ice up to 1.5 meters thick. Their primary task is escorting vessels ranging from regular cargo ships to large-tonnage tankers up to 50 meters wide, both in ice and in open water; this class of



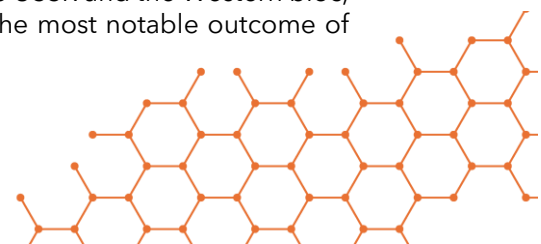
icebreakers can also operate as a powerful tug, towing ships and floating structures, which is critical for the ports of the Baltic, the Far East, and parts of the Arctic region.<sup>73</sup>

- **Project 21900M/M2** (*Vladivostok, Murmansk, Novorossiysk*) icebreakers represent the evolutionary engineering concept of the previously described class. According to Russian sources, these vessels are employed for independent escort of large-tonnage ships, towing floating infrastructure, assisting distressed vessels, and conducting emergency and rescue operations both in ice conditions and open water. Crucially, their operational remit extends well beyond navigation support: these icebreakers are deployed in oil-spill response, delivery of critical industrial equipment, and underwater technical support for drilling rigs and offshore extraction platforms.<sup>74</sup> From a competitive standpoint, multi-role configuration of these icebreakers enables Russia to cover several mission sets with a single vessel type, lowering total fleet operating costs while increasing response flexibility across complex ice and weather regimes.
- **Project 22600** (*Viktor Chernomyrdin*) – the largest (in the world) and the most powerful (25 MW; capable of navigating through up to 2 meters ice) diesel-electric icebreaker ever built in Russia<sup>75</sup> – was primarily designed for ice escort operations in the Gulf of Finland and the Baltic Sea, with the capability to support Arctic routes when required. Recent Russian planning highlights non-standard employment models, including using the vessel for seasonal Arctic cruise tourism when ice escort demand is low. This diversification increases asset utilization, creates alternative revenue streams, and improves the economic efficiency of the diesel-electric fleet.<sup>76</sup> This reflects a broader trend: Russia is reframing select icebreakers as multi-purpose commercial platforms rather than single-mission assets. This flexibility helps sustain fleet relevance year-round, supports the financial durability of icebreaking operations, and further enhances Russia's competitive position in Arctic maritime services.

In considering the importance of diesel-electric icebreakers for Russia's strategy, two aspects should be highlighted. First, Arctic-wise, the existence and use of these types of icebreakers contributes to Russia's nuclear-icebreakers-related strategy: while less technologically advanced and powerful, a combination of the sheer numerical superiority and geographic dispersion provides Russia with a persistent baseline capability unmatched by other Arctic states.

Secondly, aside from the Arctic itself, from the bigger picture point of view, the use of icebreakers could become another contributing factor in Russia's ability to resist international sanctions by channeling its exports (and navigating import flows) through alternative routes. Namely, at this juncture, the Caspian Maritime Shipping Canal – the International North-South Transport Corridor (INSTC) and the Trans-Caspian International Transport Route a 7,200-kilometer-long ship, rail, and road route for moving freight between India, Iran, Azerbaijan, Russia, and Central Asia<sup>77</sup> – that manifests Russia's growing pivot to non-Western markets should be mentioned. For example, according to Russian media, Russia has already increased the number of icebreakers operating in the Caspian Sea.<sup>78</sup>

B. Military icebreakers. From the very beginning of Russian icebreaker development, these vessels were conceived as an integral part of a dual-use strategy: they were expected to carry out civilian missions while also being capable of supporting military tasks when required. For example, Russian-language sources indicate that Russia's earliest icebreakers – dating back to the pre-1917 Imperial period – were equipped with cannons and machine guns to protect merchant and state vessels navigating the NSR.<sup>79</sup> This tradition continued, in a much more explicit way, during the Soviet era and the Second World War, in particular, when certain types of Soviet icebreakers (such as "Krasin" and "Stalin") were de-facto transformed into warships that took part in military operations in the Arctic.<sup>80</sup> After 1945, with the Arctic increasingly emerging as a theater of geopolitical competition between the USSR and the Western bloc, Moscow initiated the serial production of military-oriented icebreakers. The most notable outcome of



this effort was Project 52 *Purga*, developed specifically to meet the operational requirements of the KGB Border Guard Service.<sup>81</sup> Starting in the 1960s the Soviet side embarked on serial production of Project 97P *Ivan Susanin*-class patrol ships (between 1973–1981 eight vessels were produced in total) that were primarily designed for use by the KGB services<sup>82</sup>. This development marked a significant shift in the Soviet approach to Arctic competition: icebreakers became integral to the state's security architecture evolving into a critical component of the USSR's military-security infrastructure. Without it, the sustained resupply of northern bases, the deployment and concealment of submarines, and the continuous presence of the naval fleet in the Arctic would have been operationally impossible. This transition illustrates how icebreaking capabilities were no longer merely an enabler of navigation but were transformed into a strategic asset underpinning force projection, logistic endurance, and territorial control across the High North.

Under Putin, Russia has continued this tradition: currently, its capabilities in the realm of military icebreakers are presented by the Project 23550 multirole armed icebreaking patrol ships - the lead ship *Ivan Papanin* was laid down on April 19, 2017 at Admiralty Shipyards in Saint Petersburg and was officially commissioned into the Russian Navy on September 5, 2025 after completing trials and final preparations<sup>83</sup> - and were designed for, among others, the FSB Coast Guard, reflecting a blended military and border security mission set for Arctic waters. Publicly available sources reported this class of icebreakers to have the following military equipment on board:<sup>84</sup>

- Two Project 03160 (Raptor) patrol boats.
- A Kamov Ka-27 military helicopter (designed for anti-ship protection).
- One air-cushion vehicle (the Manul Project).
- A 100-millimetre universal A-190 artillery gun.
- An AK-176 naval gun (mounted in an enclosed turret), designed to target sea- (small boats, patrol craft, fast attack craft), coastal- (radar stations, light fortifications, vehicles near the coast), and aerial-based targets (low-flying aircraft, helicopters, some drones) including low-flying anti-ship missiles.
- The Club-K container-housed missile complex (part of the Kalibr missile family), designed to defeat sea-surface and ground targets at a range of up to 300 kilometres. As modified versions of the Kalibr sea-launched cruise missile, missiles of this type are capable of flying at extra-low altitudes, making them difficult to spot and target. Russian sources argue that in Arctic conditions, the Club-K system reinforces Russia's asymmetric potential: even a limited number of containerized launchers, dispersed along the Northern Sea Route and deployed on icebreaking platforms, significantly increases the cost and risk of any force-based scenario for an adversary.<sup>85</sup> Furthermore, this development erodes the distinction between civilian and military infrastructure, as a standard container vessel or commercial port terminal could, in practice, function as a covert launch site. However, various sources point to the Club-K possessing notable limitations that reduce its reliability in conflict. Although disguised as a standard shipping container, it depends on successful detection and targeting data; without external sensors and guidance, its stealth design becomes a drawback. The system also requires stable communications and coordination, leaving it vulnerable to jamming or network disruption. While it can be mounted on ships, trucks, or railcars, its operational flexibility is constrained by the platform's range, mobility, and survivability. Finally, its mixed missile loadouts vary in performance, meaning effectiveness changes with target type and mission profile, limiting consistent impact.<sup>86</sup> It is also worth keeping in mind that Russia's Kalibr missiles have showcased a relatively high level of interception by Ukraine's anti-missile systems<sup>87</sup> - not only through the use of Western but also Chinese FN-6 MANPADS systems<sup>88</sup> - which makes this type of munition challenging but not impossible to neutralize.

In addition to *Ivan Papanin*, Russia is also working on construction of one Project 23550 *Arktika* (also commissioned by the Russian Navy) and two *Yermak* icebreakers commissioned by the FSB Border



Service.<sup>89</sup> Completion of these projects is expected for 2027 and beyond. As Russian sources note, the universal patrol ships of Project 23550 “combine the qualities of a tug, an icebreaker, and a patrol ship” and are capable of performing the functions of an icebreaker, a tug, a firefighting vessel, and a naval combatant. In combination with the option to deploy containerized Kalibr-K launch systems, Project 23550 should not be viewed as merely an “icebreaker with a gun”,<sup>90</sup> but rather as a full-scale hybrid of a patrol warship and an icebreaker. Therefore, based on Russian sources, the declared mission set effectively positions this class as an instrument for operating in the grey zone between peace and open armed conflict. That said, while definitely contributing to the strengthening of Russia’s defence and military posture in the Arctic, integration of new types of military icebreakers into Russia’s regional military ecosystem might have some limitations. The maturation of USV and UUV capabilities after 2022<sup>91</sup> introduces an asymmetric offset against capital-intensive icebreaking platforms, raising questions about long-term cost-effectiveness and the survivability of such assets in contested maritime environments.

## Drivers of Vulnerability in Russia’s Arctic Icebreaker Superiority

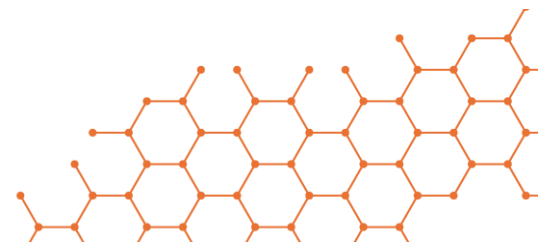
In late 2025, Putin reiterated his earlier claim that Russia is the only country in the world capable of building nuclear icebreakers in series using entirely domestic technologies.<sup>92</sup> This claim has some validity: between 2020 and 2022, Russia commissioned the new universal nuclear icebreakers of Project 22220 (Arktika, Sibir, Ural, and later Yakutia). Meanwhile, Chukotka and Leningrad are under construction, and Stalingrad has already been laid down.<sup>93</sup> Nevertheless, Putin’s statement omits a key detail. Since 2022, the situation has become considerably more complex for Russia, as its presumed technological superiority is now facing tangible challenges. The most notable example is the Icebreaker7 class, including the innovative Projects 21900M, 21900M2, and 23620, which illustrate the emerging limitations in domestic production capabilities.<sup>94</sup> Namely, further construction of innovative icebreakers of this class has been either “frozen” due to the inability to acquire foreign (Western) technologies<sup>95</sup> or “postponed” (at least until 2028) due to rapidly rising production costs.<sup>96</sup>

The Icebreaker7 case is indicative of a wider pattern. Following 2022, Russia’s shipbuilding industry, and particularly its civilian segment, has entered a period of slowdown, with overall production levels in 2024 lower than those recorded in 2023.<sup>97</sup> Furthermore, Russia’s ability to rely on foreign (sub)contractors has decreased as well. Combined with the attrition of the existing icebreakers fleet – which has been publicly admitted by Russia’s top officials<sup>98</sup> – some reports have suggested that toward the end of the decade Russia might start experiencing serious challenges in terms of effectively leveraging transportation along the NSR.<sup>99</sup>

Even in areas where Russia still dominates globally, such as Project 22220 icebreakers, Russia is already facing three significant challenges.

First, despite confident assertions by Russian officials that the *Yakutia* icebreaker proves Russia’s capability to rely entirely on domestically produced components, investigative reporting indicates otherwise.<sup>100</sup> Foreign parts were still incorporated, procured indirectly through opaque supply chains involving Turkey-based subsidiaries after direct purchases became impossible under sanctions. While this workaround continues to function for now, its long-term sustainability appears doubtful should sanctions remain in force.

This brings attention to a second challenge, rooted in the increasingly distorted economic and financial realities of both producing and operating the country’s icebreaker fleet. More specifically, an exclusive reliance on domestically manufactured components is likely to result in a substantial escalation of production costs<sup>101</sup> – reminiscent of the cost-inflationary pressures that historically undermined the Soviet economic model – and will significantly diminish the commercial viability of Russia’s icebreaker fleet unless adequate compensatory mechanisms are implemented.



Incidentally, Russia's top officials responsible for the development of the Arctic region have already (tacitly) admitted growing costs of construction of new icebreakers.<sup>102</sup> On the other hand, due to escalating capital and operating expenditures on nuclear icebreakers, Rosatom's icebreaking tariffs for the NSR have become commercially uncompetitive, prompting proposals such as an Arctic investment levy or an annually indexed fixed tariff to ensure fleet financing (never implemented).<sup>103</sup> Ultimately, Russia's economy – crippled by collapsing demographics and burdened by sanctions, multiple distortions, and one-sidedness and thus strategically uncompetitive<sup>104</sup> – akin to the Soviet era, will not be able to sustain massive and economically unwise mega projects especially if they do not accrue viable economic gains.

Ultimately, the successful exploitation of the NSR's potential rests on a multifaceted foundation, in which nuclear icebreakers are crucial but insufficient on their own. Persistent gaps in the availability of smaller, high-maneuverability icebreakers and the continued inability to establish supporting land-based transport corridors – most notably the Belkomur Arctic Railway and other land-based infrastructural initiatives<sup>105</sup> – threaten to diminish Russia's comparative advantage in nuclear icebreaker technology.

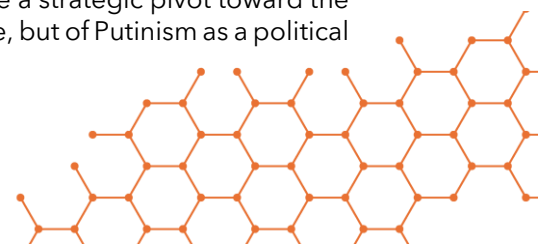
## Future Scenarios: What Is Likely to Happen Next?

This section examines scenario-based projections of Russia's position in the icebreaking sector, as shaped by the interplay of domestic developments and international conditions.

Scenario 1: Sustained sanctions pressure and a progressive erosion of leadership position. If Russia does not commit to resolving the geopolitical crisis in Europe – or chooses to embark on further geopolitical follies – and sanctions remain in place, the technological gap between Russia and the West will continue to widen. China, for its part, is unlikely to provide Russia with the full spectrum of its advanced icebreaking technologies, even if it achieves notable breakthroughs of its own. Under this scenario, Russia is likely to follow a trajectory reminiscent of the late Soviet Union: the prioritization of select flagship projects (such as gargantuan nuclear icebreakers) will further constrain the country's broader innovative capacity and, as in the USSR, result in a structural technological lag behind advanced economies. This dynamic would effectively institutionalize Russia's backwardness<sup>106</sup> in the sector, ultimately weakening and diminishing the competitiveness of its icebreaking industry for years to come.

Scenario 2: Partial lifting of sanctions and stagnation with selected success stories. Under this scenario, economic sanctions against Russia would be partially lifted and existing restrictions gradually softened – first by the United States and later by Washington's technologically advanced partners in the Indo-Pacific region (such as South Korea) and, potentially, though less likely, by the European Union. If this occurs, Russia's access to critical technologies indispensable for the production of various categories of icebreakers would become significantly easier. However, this scenario – reminiscent of the USSR during the *zastoi* ("stagnation") era under Leonid Brezhnev and his immediate successors – does not foresee Russia maintaining strategic global leadership in icebreaking technologies over the coming decades. Although renewed access to essential technologies could allow Russia to preserve segments of its existing capabilities and even achieve occasional world-class breakthroughs (most plausibly in military-oriented icebreaker projects) – developments that would undoubtedly be amplified by domestic propaganda and its aligned actors abroad – the sector as a whole would remain constrained by structural economic distortions and the growing securitization of state policy. Consequently, despite isolated successes, the icebreaking industry would continue on a path of gradual systemic decline rather than sustained recovery.

Scenario 3: Full lift of sanctions and normalization of foreign ties. This scenario – one of the least realistic in the short term, given the trajectory of Russia's domestic political development, which is increasingly oriented against the West and rooted in value-based divergence alongside a strategic pivot toward the Indo-Pacific region – presupposes not only the dismantling of Putin's regime, but of Putinism as a political



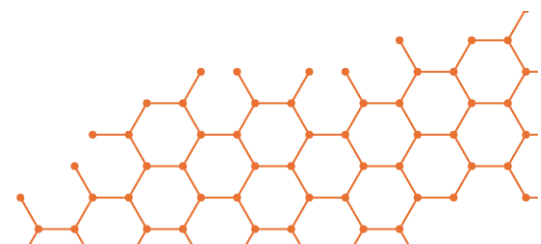
system altogether. Despite its largely unrealistic nature, the materialization of this scenario would not automatically enable Russia to close the technological gap that would have accumulated as a result of prolonged isolation and the breakdown of industrial cooperation with the West. Most importantly, the dissolution of Putinism would likely be precipitated by significant internal shocks – comparable in scale to those experienced in 1917, 1991, or other examples of historical systemic ruptures of similar magnitude – affecting the state and the entirety of Russia’s socio-political order. As a result, the country would require years, if not decades, to consolidate domestically, restore institutional capacity, and begin rebuilding its technological, economic, and scientific potential. Moreover, depending on the future configuration of the global economy, the pace of technological innovation, and evolving climatic and environmental conditions, the financial burden associated with maintaining certain categories of icebreakers may ultimately prove excessive or even unnecessary, reducing the economic rationale for preserving a massive nuclear icebreaker fleet at all.

*Scenario 4: Intensification of the Russo-Western competition for the Arctic.* Irrespective of the extent to which economic sanctions on Russia might be relaxed, this scenario envisions intensifying competition between the two actors with direct access to the Arctic – and therefore direct strategic stakes in the region – namely Russia and the Western alliance. Despite Russia’s repeated claims (which long predate 2022) that the West poses a threat to its interests in the Arctic, Western involvement since 1991 has been comparatively limited, with its presence focused primarily on environmental, scientific, humanitarian, and select economic initiatives. However, the situation changed following Russia’s unprovoked war of aggression against Ukraine: previously neutral Finland and Sweden joined NATO, and Western countries began to enter domains that had constituted areas of Russia’s near-monopoly or uncontested advantage –icebreaker capabilities. This shift became particularly evident with the launch of the Icebreaker Collaboration Effort (ICE Pact), an agreement designed to strengthen cooperation between the United States, Canada, and Finland (with its unique icebreaking capabilities) on the production of polar icebreakers.<sup>107</sup> The pact seeks to reinforce each participant’s shipbuilding sector and industrial capacity, while deepening security and economic ties through information sharing, joint workforce development, and coordinated investment in Arctic and polar capabilities. When the initiative was announced, numerous professional observers and specialized Russian media outlets expressed concern, noting that – should the three ICE Pact countries commit to reducing the gap in icebreaking capability which they might not, given their seemingly less pronounced interest in the Arctic region – the West possesses both the industrial base and technological potential to become a serious competitive challenger to Russia in the Arctic.<sup>108</sup>

Based on the analysis of the current situation and the continuation of East-West antagonism – which is increasingly taking the shape of systemic competition – Scenario 4 appears to be the most plausible. Superficially, this scenario resembles a Cold War-style rivalry: Russia would face a challenge broadly comparable to the arms race dynamics of the USSR era, during which the Soviet Union – constrained by a cumbersome, inefficient, and structurally distorted economic model – ultimately lost the competition with the Western bloc, whose economies were more adaptive and flexible.

However, the trajectory of competition today is likely to differ for three principal reasons. First, several Western countries and segments of their political elites seem to have gradually forfeited some of the strategic foresight and long-term planning capacity that characterized much of the pre-1991 period; at the same time, progressive domestic agendas – despite their importance and normative value – are reshaping societal and economic structures in ways that may limit strategic cohesion.

Second, Russia, although clearly weaker than the USSR in socioeconomic, demographic, and military terms, is no longer burdened by the extensive geopolitical commitments that contributed to Soviet overextension and resource exhaustion during the Cold War.



Third, and perhaps most importantly, the international system has become far more diverse: states outside the Western orbit (formerly labeled as the “Third World”) now play qualitatively different roles in global economics and politics – a process that has been greatly exacerbated by internal rifts in the Western camp.<sup>109</sup> As the Russo-Ukrainian war has demonstrated, this new geopolitical landscape tends to benefit Russia more than the West. Applied specifically to the Arctic and icebreaking-industry context, this means that if Scenario 4 materializes, Russia could secure support from countries that either refused to align with the West after 2022 or openly backed Moscow – not necessarily out of affinity, but rather as a way to weaken Western influence. Should two conditions be met – (1) the continued erosion of Western global economic and defense leadership, accompanied by internal fragmentation, and (2) the strengthening and consolidation of major non-Western actors – the Arctic would likely evolve from a bilateral Russo-Western arena into a broader geopolitical contest between the Western and non-Western worlds. Under such circumstances, Russia could reasonably expect, in varying forms depending on the depth of the East-West rift, support from at least three major powers (China, India, and Turkey), complemented by a wider group of secondary partners with more limited but still extremely meaningful roles.

China, which has already assisted Russia in mitigating the effects of Western sanctions on Arctic-related projects, is now building an icebreaking tug for Russia under the classification standards of the Russian Maritime Register of Shipping.<sup>110</sup> The recent launch of an icebreaking tug constructed by Huigang International specifically for operations along the NSR demonstrates two key trends: on the one hand, Chinese shipyards are obtaining certification to meet Russian technical and regulatory requirements; on the other, Moscow and Beijing are capable of scaling cooperation from small icebreaking tugs to potentially larger ice-class vessels in the future. However, Beijing will proceed with caution as demonstrated in other projects.<sup>111</sup>

Yet, depending on the evolving depth of the East-West confrontation and Russia’s strategic position, Beijing’s stance could shift toward a more proactive and supportive role in meeting Russia’s icebreaking needs. At present, however, despite numerous declarations by both Russia and China emphasizing the existence of a “limitless” strategic partnership, Moscow appears to harbor a degree of concern regarding Beijing’s plans to pursue the domestic construction of an independent icebreaker fleet. From the Russian perspective, such ambitions may signal China’s intention to acquire greater operational autonomy in the Arctic – potentially at Russia’s expense. These concerns have been implicitly, though clearly, articulated by Russian Foreign Minister Sergei Lavrov, who emphasized that Russia alone possesses the full capacity to develop its Arctic territories.<sup>112</sup> This, he noted, includes the ability to provide icebreaker convoys and escorts for a wide range of cargo vessels and to independently implement its broader Arctic development plans.

India – given its post-2022 alignment with Russia through large-scale oil purchases that has helped Moscow sustain its war of aggression against Ukraine – represents another actor with the potential to provide Russia with limited support, although its motivations are likely to be considerably weaker than China’s. In fact, in 2025 Moscow proposed to New Delhi a joint program for constructing Arctic-class vessels, under which Russia would supply design solutions for ice-class ships while India would contribute shipyards and part of the industrial capacity.<sup>113</sup> However, because India is not in a state of systemic or acute economic or political confrontation with the West, it is unlikely to fully side with Russia. This does not preclude the possibility of selective cooperation or targeted assistance, but New Delhi’s support will remain conditional, transactional, and carefully calibrated so as not to jeopardize its broader strategic relations with Western partners.

Turkey – since the outbreak of the Russo-Ukrainian war in 2022 – has, despite its historically tense relationship with Russia, played a notable role in helping Moscow withstand international economic sanctions. Ankara has done so through a variety of mechanisms and sectors, including, at times, involvement in Arctic-related shipbuilding projects.<sup>114</sup> However, Turkey’s cooperation with Russia should



be understood as primarily transactional and profit-driven, rather than rooted in strategic alignment or ideological affinity. Consequently, the extent of Turkish support will depend heavily on several variables: the condition of the Russian economy, the state of its defense capabilities, and critically, the positions of both the United States and China. Depending on how these factors evolve, Ankara may continue to assist Russia; or, alternatively, adopt a more distant or even adversarial posture.

A fourth group of states is more diverse - including, among others, Iran, Kazakhstan, the UAE, South Korea (under certain conditions), and Singapore - and their potential support for Russia would be constrained by various factors, such as the limited scale of their economies, technological shortcomings, or broader international dynamics, including the status of anti-Russian sanctions. Nevertheless, as the post-2022 period has clearly demonstrated, the assistance of such middle powers can become a significant factor in enabling Russia to withstand sanctions pressure by diversifying import channels, facilitating alternative payment mechanisms, and thereby reducing the effectiveness of Western economic restrictions.

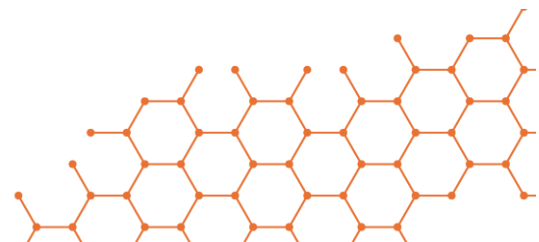
## Conclusion

Russia's icebreaking capabilities represent a foundational pillar of its Arctic power projection. Despite the fact that icebreakers occupy a relatively marginal position in formal strategic doctrines, their operational and (geo)political utility far exceeds their doctrinal visibility. In practice, icebreakers serve as the primary instrument through which Russia translates Arctic ambitions into sustained presence, economic leverage, and escalation management. They are not merely tools of navigation: they are force multipliers across civilian, cultural-diplomatic, and military domains. Operationally, Russia's icebreaker fleet enables year-round maritime logistics along the NSR, maintaining supply chains in climatically hostile environments and underpinning the export infrastructure for hydrocarbons, which remains central to the country's revenue structure.

This logistical resilience is a strategic asset in itself: it secures internal cohesion across remote Arctic territories, while supporting Russia's reorientation toward Asian markets as Western sanctions narrow access to Europe. At the same time, icebreakers enable high-visibility civilian missions - scientific expeditions, international educational outreach programs, and tourism - that function as instruments of soft power and perception management, reinforcing Russia's claim to indispensable status in Arctic governance.

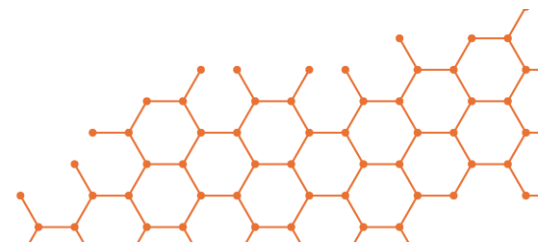
It is important to note that Russia's approach anticipates contestation below the threshold of open conflict. Icebreakers are increasingly integrated into concepts for hybrid and gray-zone competition, where infrastructure, logistics, and mobility matter as much as kinetic force. Armed and dual-use platforms, such as the Project 23550 class, signal an intent to blur distinctions between civilian and military assets, complicating deterrence calculations and raising the cost of Western countermoves. In this context, icebreakers are not a peripheral capability; they are a critical enabler of escalation control and strategic ambiguity in the High North.

However, Russia's leadership in icebreaking is not guaranteed to endure. The fleet faces structural vulnerabilities: sanctions-driven technological shortages, cost inflation in shipbuilding, delays in flagship nuclear projects, and workforce and supply-chain attrition. These challenges erode the long-term viability of Russia's advantage, particularly if Western states elect to reposition the Arctic from a secondary to a vital strategic theatre. Early signs of this shift - such as emergence of the ICE Pact or China's interest in developing its own (much more advanced) icebreaking capabilities - suggest that



Russia's insulation from competition is ending. Should Western actors mobilize at scale, the industrial and technological base exists to contest Russia's lead within a decade.

It is likely that in the short-to-mid-term prospect Russia - which typically earmarks huge financial means for projects of geopolitical (or ideological) importance - will be able to retain a dominant but increasingly conditional advantage. Icebreakers have become the backbone of its Arctic strategy: economically indispensable, diplomatically symbolic, and militarily relevant in hybrid conflict scenarios. Their future effectiveness will depend on whether Moscow can sustain capabilities faster than international challengers mobilize to erode them.



## Notes

<sup>1</sup> Arktika: nauka vazhnee," Rossiya v global'noy politike (Global Affairs), accessed January 24, 2025, <https://globalaffairs.ru/articles/arktika-nauka-vazhnee/>

<sup>2</sup> Larina, A. S., "Dinamika naseleniya Kraynego Severa i Arktiki: analiz na osnove dannykh vserossiyskikh perepisey 2010 i 2020 gg," Cyberleninka, <https://cyberleninka.ru/article/n/dinamika-naseleniya-kraynego-severa-i-arktiki-analiz-na-osnove-dannyh-vserossiyskikh-perepisey-2010-i-2020-gg>; Sukhov, Pavel, "Slabo kontroliruemoe szhatie: kak reshat' problemu depopulyatsii v Arkticheskoy zone," Porarctic, <https://porarctic.ru/ru/comments/pavel-sukhov-slabo-kontroliruemoe-szhatie-kak-reshat-problemu-depopulyatsii-v-arkticheskoy-zone/>

<sup>3</sup> Ministry of Transport of the Russian Federation, "Press release on Russia's icebreaker fleet expansion," <https://mintrans.gov.ru/press-center/news/11115>

<sup>4</sup> Armstrong, Terence. *The Northern Sea Route: Soviet Exploitation of the North East Passage*. Cambridge: Cambridge University Press, 1952, 1-15.

<sup>5</sup> Timoshenko, G. I. *Istoriya ledokol'nogo flota Rossii*. Saint Petersburg: Sudostroenie, 2008.

<sup>6</sup> Tsentral'nyy ispolnitel'nyy komitet SSSR, "Postanovlenie ob ob'yavlenii territoriyey Soyuza SSR zemel' i ostrovov, raspolozhennykh v Severnom Ledovitom okeane," April 15, 1926.

<sup>7</sup> "Re-establishment of the state nuclear icebreaker operator," Atomic Energy, August 5, 2022, <https://www.atomic-energy.ru/news/2022/08/05/127067>

<sup>8</sup> Hill, Fiona. *The Siberian Curse: How Communist Planners Left Russia Out in the Cold*. Washington, DC: Brookings Institution Press, 2003.

<sup>9</sup> Østreng, Willy (ed.). *Science and Politics of the Arctic*. Berlin: Springer, 2013.

<sup>10</sup> Kuznetsov, N. N. *Sudostroitel'naya promyshlennost' SSSR v dovoynenny period*. Moscow: Mashinostroenie, 1985, 112-125.

<sup>11</sup> Petrov, A. N., and J. K. Graybill. "Arctic Industrialization and Soviet Regional Development," *Polar Geography* (2017).

<sup>12</sup> Major Soviet shipbuilding facilities – including Baltiysky Zavod, Admiralteyskie Verfi, Severnaya Verf, and the Vyborg Shipyard in Leningrad; the A. Marti Shipyard in Nikolaev; and yards in Kherson, Arkhangelsk, Gorky (Nizhny Novgorod), and Krasnoyarsk – were central nodes of the USSR's industrial network. These sites contributed to the construction of ice-capable vessels and icebreakers that supported Arctic navigation and inland transportation, shaping the foundations of later Russian icebreaking capabilities.

<sup>13</sup> Kulagin, V. A. *Mezhdunarodnoye sotrudnichestvo SSSR v sudostroenii*. Moscow: n.p., 1983.

<sup>14</sup> "Finnish-Soviet Nuclear Icebreakers," *Physics Today*, <https://physicstoday.aip.org/features/finnish-soviet-nuclear-icebreakers>

<sup>15</sup> Josephson, Paul. "Technology and the Conquest of the Soviet Arctic." *The Russian Review* 70, no. 3 (July 2011): 419-39, <https://www.jstor.org/stable/41289976?utm>

<sup>16</sup> McCannon, John. *Red Arctic: Polar Exploration and the Myth of the North in the Soviet Union, 1932-1939*. New York and Oxford: Oxford University Press, 1998.

<sup>17</sup> "Glavnoe upravlenie Severnogo morskogo puti v istorii upravleniya Arktikoi", <https://cyberleninka.ru/article/n/glavnoe-upravlenie-severnogo-morskogo-puti-v-istorii-upravleniya-arktikoym>

<sup>18</sup> Platonov, A. V. *Boevye korabli SSSR 1939-1945*. St. Petersburg, 1996.

<sup>19</sup> Laksin, V. N., and B. N. Porfir'ev. *Razvitie Arkticheskoi zony RF. Section on infrastructure reproduction deficit in the 1990s and early 2000s*.

<sup>20</sup> Blinov, Vladimir Mikhailovich. *Istoriia formirovaniia v Rossiiskoi Arktike edinoi sistemy gosudarstvennogo upravleniia ledokol'no-transportnym flotom: na primere FGUP "Atomflot" Gosudarstvennoi korporatsii "Rosatom"*. 2019, <https://cyberleninka.ru/article/n/istoriya-formirovaniya->



v-rossiyskoy-arktike-edinoy-sistemy-gosudarstvennogo-upravleniya-ledokolno-transportnym-flotom-na-primere

<sup>21</sup> Borisov, V. N. "Severnyi morskoy put' v sisteme natsional'nykh interesov Rossii." *Problemy Arktiki i Antarktiki* (2006), no. 1: 17-28.

<sup>22</sup> Zaitsev, Iu. K. "Ekonomicheskie predposylki vozrozhdeniia Severnogo morskogo puti." *Regional'naia ekonomika* (2004), no. 4: 45-56.

<sup>23</sup> Zhil'tsov, S. S. "Severnyi morskoy put' kak faktor geopolityki Rossii." *Mirovaia ekonomika i mezhdunarodnye otnosheniia* (2005), no. 7: 98-107.

<sup>24</sup> Konovalov, A. O. "Arktika v sisteme natsional'noi bezopasnosti Rossii." *Nezavisimoe voennoe obozrenie* (2002), no. 4: 3-5.; Klimov, A. A. "Voенно-strategicheskoe znachenie Arktiki dlia Rossii." *Voennaia mysl'* (2003), no. 6: 22-31.

<sup>25</sup> Prezident Rossiiskoi Federatsii., <http://kremlin.ru/supplement/1800>

<sup>26</sup> BBC News, <http://news.bbc.co.uk/2/hi/europe/6927395.stm>

<sup>27</sup> Prezident Rossiiskoi Federatsii. Osnovy gosudarstvennoi politiki Rossiiskoi Federatsii v Arktike na period do 2020 goda i dal'neishuiu perspektivu, September 18, 2008, No. Pr-1969.

<sup>28</sup> Pravitel'stvo Rossiiskoi Federatsii. Administratsiia Severnogo morskogo puti (materialy k dokumentu), March 15, 2013.

<sup>29</sup> "V Arktike nachinaet deystvovat' ob"edinonnoe strategicheskoe komandovanie "Sever'", 2019, <https://tass.ru/spb-news/1612884>

<sup>30</sup> Prezident Rossiiskoi Federatsii. Morskaia doktrina Rossiiskoi Federatsii, July 26, 2015, [https://www.consultant.ru/document/cons\\_doc\\_LAW\\_208427/](https://www.consultant.ru/document/cons_doc_LAW_208427/)

<sup>31</sup> "Ukaz Prezidenta Rossiyskoy Federatsii ot 26.10.2020 g. № 645

O Strategii razvitiya Arkticheskoy zony Rossiyskoy Federatsii i obespecheniya natsional'noy bezopasnosti na period do 2035 goda", <http://kremlin.ru/acts/bank/45972>

<sup>32</sup> Prezident Rossiiskoi Federatsii. Ukaz No. 512 "Ob utverzhdenii Morskoj doktriny Rossiiskoi Federatsii", July 31, 2022.

<sup>33</sup> The Wilson Center. "No. 17: The Arctic Component of Russia's New Maritime Doctrine." Wilson Center, <https://www.wilsoncenter.org/blog-post/no-17-arctic-component-russias-new-maritime-doctrine>

<sup>34</sup> Pravitel'stvo Rossiiskoi Federatsii, <http://static.government.ru/media/files/lcRbgf2IkDV5TnMmASEyDG5FjYvT4r2p.pdf>

<sup>35</sup> Sukhankin, Sergey. "Russia Bets on Nuclear Energy Diplomacy in Hungary." *Eurasia Daily Monitor*, Foreign Policy publication, December 18, 2025, <https://jamestown.org/russia-bets-on-nuclear-energy-diplomacy-in-hungary/>

<sup>36</sup> Nakhle, Carole. "Will Norway Turn the Energy Crisis Into Opportunity?" *Geopolitical Intelligence Services*, August 2, 2022, <https://www.gisreportsonline.com/r/norway-energy-crisis/>.

<sup>37</sup> Vorontsov, Grigorii. "V NATO predskazali voennoe stolknovenie s Rossiei v Arktike." *Metro Moscow*, May 24, 2024, <https://www.gazetametro.ru/articles/v-nato-predskazali-voennoe-stolknovenie-s-rossiej-v-arktike-2405-2024>.

<sup>38</sup> "Ministr oborony zayavil o svidetel'stvakh podgotovki NATO k voyne s Rossiyey cherez 5 let", 2025, <https://www.interfax.ru/russia/1063747>

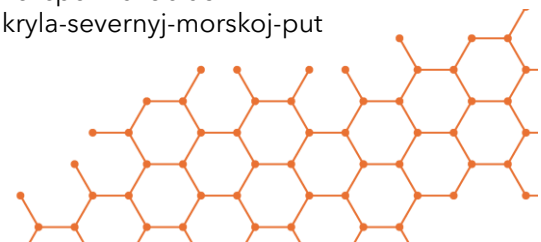
<sup>39</sup> "Russia fully ready to defend its interests in Arctic – Lavrov", 19 Sep 2024, <https://tass.com/politics/1845497>

<sup>40</sup> Dybov, Valentin, Maksim Kolod'ko, Iurii Podgornykh, and Natal'ia Kul'kova. "Arktika kak vozmozhnyi teatr voennykh deistvii (chast' 2)." *Arsenal Otechestva* 5, no. 67 (2023).

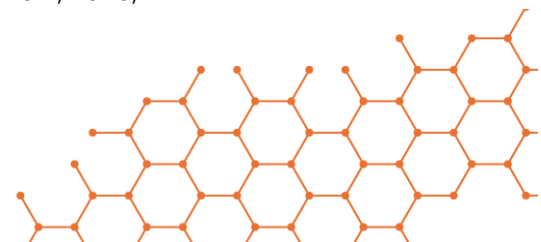
<sup>41</sup> Bartosh, Aleksandr. "Mirovaia gibridnaia voina v strategii SShA i NATO." *Nezavisimoe voennoe obozrenie*, February 24, 2022, [https://nvo.ng.ru/concepts/2022-02-24/1\\_1178\\_strategy.html](https://nvo.ng.ru/concepts/2022-02-24/1_1178_strategy.html)

<sup>42</sup> Boevye ledokoly v Arktike. *Arsenal Otechestva*, <https://arsenal-otechestva.ru/article/1709-boevye-ledokoly-v-arktike>

<sup>43</sup> "Rossiya zakryla Severnyi morskoy put arkticheskimi 'Bastionami': Voenni ekspert razoblachil Forbes." *Tsargrad.tv*, December 2, 2019, [https://tsargrad.tv/news/rossija-zakryla-severnyj-morskoy-put-arkticheskimi-bastionami-voennyj-jekspert-razoblachil-forbes\\_228490](https://tsargrad.tv/news/rossija-zakryla-severnyj-morskoy-put-arkticheskimi-bastionami-voennyj-jekspert-razoblachil-forbes_228490)



- <sup>44</sup> "Arktika: voenno-strategicheskaya obstanovka, osnovnye ugrozy i puti ikh pariromaniia Rossiiy", <https://cyberleninka.ru/article/n/arktika-voenno-strategicheskaya-obstanovka-osnovnye-ugrozy-i-puti-ih-parirovaniya-rossiiy>
- <sup>45</sup> Sukhankin S. The "Fourth Battle" for the Arctic: Russia's Capabilities, Strategic Thinking, and Game Plan. Canadian Maritime Security Network, March 2025, [https://76af1b57-9a2d-4a3b-b4b5-38e252782728.filesusr.com/ugd/e9367f\\_eb389257c41244edbb0c5846439e26ec.pdf](https://76af1b57-9a2d-4a3b-b4b5-38e252782728.filesusr.com/ugd/e9367f_eb389257c41244edbb0c5846439e26ec.pdf)
- <sup>46</sup> E.O. Labetskaya, "Cirkumpolyarnyy front gibridnoy voyny kollektivnogo Zapada protiv RF (tsivilizatsionnyy aspekt)", [https://www.imemo.ru/files/File/ru/Articles/2024/VestnikInstMirTyvil-022024-Labetskaya\(1\).pdf](https://www.imemo.ru/files/File/ru/Articles/2024/VestnikInstMirTyvil-022024-Labetskaya(1).pdf)
- <sup>47</sup> Russian Academy of Sciences. Arktika: ekonomika i bezopasnost'. Moscow: 2021.
- <sup>48</sup> Ledokol. Bol'shaia rossiiskaia entsiklopediia, <https://bigenc.ru/c/ledokol-c11ee0?utm>
- <sup>49</sup> "Rosatom" izgotovil pervuyu partiyu yadernogo topliva dlya ledokola "Rossiya", 2025, <https://ria.ru/20251224/rossiya-2064374245.html>
- <sup>50</sup> "Na stroitel'stvo atomnogo ledokola "Rossiya" v byudzhete zalozhili 26,2 mlrd rubley", <https://tass.ru/ekonomika/25196401>
- <sup>51</sup> Rand Corporation. Arctic Logistics and Security. Santa Monica, CA: RAND Corporation, 2021.
- <sup>52</sup> Sergey Sukhankin, "Russia's Icebreaker Buildup: A Mixture of Geo-Economic and Military-Political Calculations." The Jamestown Foundation, <https://jamestown.org/russias-icebreaker-buildup-a-mixture-of-geo-economic-and-military-political-calculations>
- <sup>53</sup> Krylov State Research Center. Proekt 22220. St. Petersburg: 2018.
- <sup>54</sup> "Atomnye giganty dlya Arktiki. Rossiya stroit sed'moy ledokol proekta 22220", <https://tass.ru/info/19827819>
- <sup>55</sup> "Prezident RF otmetil, chto Rossiya seychas edinstvennaya v mire strana, sposobnaya vesti seriynoe proizvodstvo moshchnykh ledokolov". Redaktsiya sayta TASS. November 18, <https://tass.ru/politika/25656583>
- <sup>56</sup> "Universal'nye atomnye ledokoly proekta 22220", <https://www.rosatomflot.ru/flot/universalnyy-atomnyy-ledokol-proekta-22220/>
- <sup>57</sup> U.S. Coast Guard. Arctic Strategic Outlook. Washington, DC: U.S. Coast Guard, 2022.
- <sup>58</sup> Atomflot. Navigatsiia v vysokikh shirotakh. 2021.
- <sup>59</sup> "Ledokol 'Arktika' dostig Severnovo poliosa." RIA Novosti, August 1, 2007.
- <sup>60</sup> Barinova, Irina. Ledokol'nyi flot Rossii i arkticheskaya logistika. Moscow: IMEMO RAN, 2021.
- <sup>61</sup> "13 avgusta iz Murmanska startovala shestaya mezhdunarodnaya arkticheskaya ekspeditsiya 'Ledokol znaniy'." August 13, 2025, <https://rosatomflot.ru/press-centr/novosti-predpriyatiya/2025/08/13/11690-3-avgusta-iz-murmanska-startovala-shestaya-mezhdunarodnaya-arkticheskaya-ekspeditsiya-ledokol-znaniy>
- <sup>62</sup> "Atomnyi ledokol Vaigach proshel odin million morskikh mil." Rossiiskaia gazeta, February 15, 2021, <https://rg.ru/2021/02/15/reg-szfo/atomnyj-ledokol-vaigach-proshel-odin-million-morskikh-mil.html>
- <sup>63</sup> "Nuclear-Powered Icebreakers". BiblioAtom.ru, <https://www.biblioatom.ru/core-systems/nuclear-powered-icebreakers/10580>
- <sup>64</sup> "Perspektivy razvitiia arkticheskoi morskoi transportnoi sistemy", <https://cyberleninka.ru/article/n/perspektivy-razvitiya-arkticheskoy-morskoy-transportnoy-sistemy>
- <sup>65</sup> "V Arktike nikto ne zamenit atomnye ledokoly." September 11, 2023, <https://www.kommersant.ru/doc/6209146>
- <sup>66</sup> Aleksushin, G. V. "Razvitie atomnogo ledokol'nogo flota i ego roli v ekonomicheskom osvoenii Severnogo morskogo puti." Arktika i Sever 53 (2023): 28-35.
- <sup>67</sup> Selin, Valery. Ekonomika arkticheskogo moreplavaniia. Murmansk: 2020.
- <sup>68</sup> Vasilii Dandykhin. "Atomnyy ledokol proekta 'Lider' – nash otvet tem, kto sobiraetsya vytesnit' Rossiiyu iz Arktiki i ustanovit' svoy kontrol' nad etim strategicheski vazhnym regionom", <https://zvezdaweekly.ru/news/20204261351-A4RCn.html>
- <sup>69</sup> "Tramp rasporyadilsya razrabotat' programmu stroitel'stva ledokolov." June 9, 2020, <https://russian.rt.com/world/news/753789-tramp-stroitelstvo-ledokolov>



- <sup>70</sup> Karpov, Aleksandr, and Alyona Medvedeva. "Polyarnyy dedlayn: udastsya li SShA sozdat' ledokol'nyy flot k 2029 godu dlya postoyannogo prisutstviya v Arktike." June 11, 2020, <https://russian.rt.com/world/article/754138-ledokol-ssha-tramp-arktika>
- <sup>71</sup> Russia's total icebreaker fleet includes around 34 diesel-electric icebreakers out of roughly 41 total icebreaking vessels. For more information see: Davis, Anna J. "Russia Sends Children to North Pole on Nuclear-Powered Icebreakers." Eurasia Daily Monitor (Panorama), April 18, 2025, <https://jamestown.org/russia-sends-children-to-north-pole-on-nuclear-powered-icebreakers/>
- <sup>72</sup> "Ledokol'nyy flot Kaspiyskogo basseyna usilyat v zimnyuyu navigatsiyu." October 21, 2024, <https://www.interfax.ru/russia/987740>
- <sup>73</sup> "Ledokol 'Moskva' zavershil rabotu v bukhte Nagaeva", <https://marine.org.ru/events/sudostroenie/14212/>
- <sup>74</sup> "Dizel'-elektricheskij ledokol proekta 21900M2." February 4, 2025, <https://www.arctic-today.ru/index.php/arkticheskaya-transportnaya-sistema/692-dizel-elektricheskij-ledokol-proekta-21900m2>
- <sup>75</sup> "Tested by the Arctic: The Most Powerful Non-Nuclear Icebreaker in the World, Viktor Chernomyrdin, Is Poised to Begin Operations." May 6, 2022, <https://arctic-russia.ru/en/article/tested-by-the-arctic>
- <sup>76</sup> "Ledokol 'Viktor Chernomyrdin' otpravitsya v kruiz." April 22, 2025, <https://sudostroenie.info/novosti/45055.html>
- <sup>77</sup> Sukhankin, Sergey. "Russia Hopes to Use Caspian Sea Route to Evade Sanctions." Eurasia Daily Monitor 21, no. 35, June 3, 2024, <https://jamestown.org/russia-hopes-to-use-caspian-sea-route-to-evade-sanctions/>
- <sup>78</sup> "Ledokol'nyy flot Kaspiyskogo basseyna usilyat v zimnyuyu navigatsiyu." October 21, 2024, <https://www.interfax.ru/russia/987740>
- <sup>79</sup> Tarakanov, Konstantin. "'Taymyr' i 'Vaygach': pionery Sevmorputi." June 24, 2024, [https://flagman-news.ru/news/retroflot/\\_taymyr\\_i\\_vaigach\\_pionery\\_cevmorputi.html](https://flagman-news.ru/news/retroflot/_taymyr_i_vaigach_pionery_cevmorputi.html)
- <sup>80</sup> "Kak voyeval ledokol 'Krasin'." 2016, <https://topwar.ru/97750-kak-voeval-ledokol-krasin.html>
- <sup>81</sup> "Pogranichnyy storozhevoy korabl' ledovogo klassa proekta 52 'Purga'", [https://zonwar.ru/news2/news\\_222\\_52-Purga.html](https://zonwar.ru/news2/news_222_52-Purga.html)
- <sup>82</sup> "O nastoyashchikh boevykh ledokolakh proekta 97P." Russkaya vesna, June 3, 2019, <https://rusvesna.su/news/1556810100>.
- <sup>83</sup> "Russia Commissions New Armed Icebreaker Ivan Papanin to Expand Control over Arctic Routes." September 9, 2025, <https://www.armyrecognition.com/news/navy-news/2025/russia-commissions-new-armed-icebreaker-ivan-papanin-to-expand-control-of-arctic-routes>
- <sup>84</sup> Sergey Sukhankin, "'Military Icebreakers'—Russia's Trump Card in the Battle for the Arctic?," The Jamestown Foundation, Eurasia Daily Monitor 16, no. 94, June 26, 2019, <https://jamestown.org/program/military-icebreakersrussias-trump-card-in-the-battle-for-the-arctic/>
- <sup>85</sup> Slobodyan, Elena. "Konteynernyy raketnyy kompleks Club-K. Infografika." January 18, 2016, [https://aif.ru/dontknows/infographics/konteynernyy\\_raketnyy\\_kompleks\\_club-k\\_infografika;](https://aif.ru/dontknows/infographics/konteynernyy_raketnyy_kompleks_club-k_infografika;) "Konteynernyy kompleks raketnogo oruzhiya Club-K.", <https://missilery.info/gallery/konteynernyy-kompleks-raketnogo-oruzhiya-club-k>
- <sup>86</sup> "Rocket Complex Club-K: Criticism and Perspectives." 2012, <https://en.topwar.ru/18852-raketnyy-kompleks-club-k-kritika-i-perspektivy.html>; Fanning, Mary, and Alan Jones. Saddam's Revenge: Ash Carter, NLOS-LS, Russia's Club-K, Iran, KGL, and Gulfstream and How They Converge to Put America in Mortal Danger. Occasional Paper for the Center for Security Policy, August 2, 2018, [https://centerforsecuritypolicy.org/wp-content/uploads/2018/08/NLOS-LS\\_CLUB-K\\_08-02-18.pdf](https://centerforsecuritypolicy.org/wp-content/uploads/2018/08/NLOS-LS_CLUB-K_08-02-18.pdf)
- <sup>87</sup> Syngaivska, Sofiiia. "Ukrainian Air Defenders Destroy Russian Kalibr Cruise Missile with the Hawk System (Video)." December 7, 2025, [https://en.defence-ua.com/news/ukrainian\\_air\\_defenders\\_destroy\\_russian\\_kalibr\\_cruise\\_missile\\_with\\_the\\_hawk\\_system\\_video-16739.html](https://en.defence-ua.com/news/ukrainian_air_defenders_destroy_russian_kalibr_cruise_missile_with_the_hawk_system_video-16739.html)
- <sup>88</sup> "Ukrainian Soldier Downs Russian Kalibr Missile with a Chinese FN-6—a First-of-Its-Kind Intercept." November 20, 2025, <https://united24media.com/latest-news/ukrainian-soldier-downs-russian-kalibr-missile-with-a-chinese-fn-6-a-first-of-its-kind-intercept-13617>



- <sup>89</sup> "Chto izvestno o patrol'nykh korablyakh ledovogo klassa proekta 23550." September 5, 2025, <https://tass.ru/info/24973149>
- <sup>90</sup> "Universal'nye patrol'nye korabli arkticheskoy zony ledovogo klassa proekta 23550", <https://vpk.name/library/ff/project-23550.html>
- <sup>91</sup> Lukatsky, Efrem, and Derek Gatopoulos. "Ukraine Unveils Upgraded Sea Drone for Black Sea Strike Missions." Associated Press, October 22, 2025, <https://www.defensenews.com/global/europe/2025/10/22/ukraine-unveils-upgraded-sea-drone-for-black-sea-strike-missions/>
- <sup>92</sup> "Putin: RF edinstvennaya strana, sposobnaya vesti seriynoye proizvodstvo ledokolov." 2025, <https://tass.ru/ekonomika/25656743>
- <sup>93</sup> "Ledokol 'Chukotka' proekta 22220 peredadut zakazchiku v dekabre 2026 goda." November 18, 2025, <https://paluba.media/news/204813>
- <sup>94</sup> "Analiz sostoyaniya i perspektiv razvitiya sudostroitel'noy otrasli Rossii." July 29, 2025, <https://delprof.ru/press-center/open-analytics/analiz-sostoyaniya-i-perspektiv-razvitiya-sudostroitelnoy-otrasli-rossii/>
- <sup>95</sup> "Sanctions Force Russia to Cancel Icebreaker Order and Layoffs at Shipyards." August 15, 2025, <https://maritime-executive.com/article/sanctions-force-russia-to-cancel-icebreaker-order-and-layoffs-at-shipyards>
- <sup>96</sup> Vedmedenko, Il'ya. "Polnyy proval: Rossiya ne smogla postroit' 'innovatsionnye' ledokoly." December 1, 2025, <https://www.unian.net/economics/other/rossiya-ne-smogla-postroit-innovatsionnye-ledokoly-kakaya-prichina-13213107.html>
- <sup>97</sup> "Byulleten' EastRussia: otraslevoy obzor sudostroeniya DFO – vesna 2025." May 23, 2025, <https://www.eastrussia.ru/material/byulleten-eastrussia-otraslevoy-obzor-sudostroeniya-dfo-vesna-2025/>
- <sup>98</sup> Medvedev, Dmitry A. "Rossiya – glavnoye arkticheskoye gosudarstvo, poetomu defitsit ledokolnogo flota nedopustim." November 18, 2022, <https://web.archive.org/web/20250731133940/https://damedvedev.ru/security-council/43>
- <sup>99</sup> "Suda pokazali krepkuyu nekhvatku." July 1, 2024, <https://www.kommersant.ru/doc/6794187>
- <sup>100</sup> Kagermazov, Sergey, and Anastasiya Platonova. "Bitva za Arktiku. Kak Rossiya nachala otstavat' v proizvodstve ledokolov." BBC Russian Service, September 22, 2025, <https://www.bbc.com/russian/articles/c5yjj68yv1vo>
- <sup>101</sup> "Zaderzhku ledovykh ispytaniy golovnogogo ledokola 'Arktika' proekta 22220 v Krylovskom GNTs otsenili v 91,7 mln rubley." June 26, 2025, <https://mashnews.ru/zaderzhku-ledovykh-ispytaniy-golovnogogo-ledokola-arktiki-proekta-22220-v-krylovskom-gncz-ocenili-v-917-mln-rublej.html>
- <sup>102</sup> "Spetspredstavitel' 'Rosatoma' po Arktike: Ledokol'naya provodka na Sevmorputi ne dolzhna dorozhat' do polnoy 'raskatki' marshruta." June 18, 2025, <https://www.interfax.ru/interview/1031759>
- <sup>103</sup> "Ledosbor." December 18, 2024, [https://www.kommersant.ru/doc/7382754?from=glavnoe\\_1](https://www.kommersant.ru/doc/7382754?from=glavnoe_1)
- <sup>104</sup> Sukhankin, Sergey. "Russia's War Economy Wilts Under Sanctions as Measures Become More Targeted." Eurasia Daily Monitor, August 20, 2024, <https://jamestown.org/russias-war-economy-wilts-under-sanctions-as-measures-become-more-targeted/>
- <sup>105</sup> Sukhankin, Sergey. "Russia's Belkomur Arctic Railway Project: Hope, Illusion or Necessity?" Eurasia Daily Monitor 16, no. 102, July 17, 2019, <https://jamestown.org/russias-belkomur-arctic-railway-project-hope-illusion-or-necessity/>
- <sup>106</sup> Staalesen, Atle. "Moskva tolkaet arkticheskoye sudokhodstvo k katastrofe." September 24, 2025, <https://ru.thebarentsobserver.com/moskva-tolkaet-arkticheskoye-sudokhodstvo-k-katastrofe/437724>
- <sup>107</sup> "Biden-Harris Administration Announces New Polar Partnership 'ICE Pact' Alongside Finland and Canada." White House Press Release, July 11, 2024, <https://www.presidency.ucsb.edu/documents/white-house-press-release-biden-harris-administration-announces-new-polar-partnership-ice>
- <sup>108</sup> Kortunov, Andrey. "Naskol'ko neizbezna 'ledokol'naya gonka'?" July 29, 2024, <https://russiancouncil.ru/analytics-and-comments/analytics/naskolko-neizbezna-ledokolnaya-gonka/>



---

<sup>109</sup> Prince Michael of Liechtenstein. "Global Challenges in 2026 and Beyond." December 29, 2025, <https://www.gisreportsonline.com/r/challenges-in-2026-and-beyond/>

<sup>110</sup> "V Kitae sostoyalas' zakladka ledokol'nykh buksirov na klass Rossiyskogo morskogo registra sudokhodstva", October 13, 2025, <https://neftegaz.ru/news/Suda-i-sudostroenie/903075-v-kitae-sostoyalas-zakladka-ledokolnykh-buksirov-na-klass-rossiyskogo-morskogo-registra-sudokhodstva/>

<sup>111</sup> Afanas'ev, S. N., and A. M. Fadeev. "Rossiysko-kitayskoe tekhnologicheskoe partnerstvo v Arktike na primere proekta 'Yamal SPG.'" *Arktika i innovatsii* 3, no. 1 (2025): 33–41.

<sup>112</sup> Lavrov, Sergei. "Rossiya mozhet v odinochku razvivat' svoi territorii v Arktike, zayavil Lavrov." February 19, 2025, <https://ria.ru/20250219/lavrov-2000285113.html?in=t>

<sup>113</sup> "Russia Plans Shipbuilding Foray in India: First Deputy PM Manturov." December 4, 2025, [https://www.business-standard.com/economy/news/russia-shipbuilding-foray-india-polar-vessels-manturov-125120401255\\_1.html](https://www.business-standard.com/economy/news/russia-shipbuilding-foray-india-polar-vessels-manturov-125120401255_1.html)

<sup>114</sup> Nilsen, Thomas. "Nuclear Icebreaker Had to Sail All to St. Petersburg for Basic Hull Work as Russia Lacks Northern Dock." July 4, 2025, <https://www.thebarentsobserver.com/news/nuclear-icebreaker-had-to-sail-all-to-st-petersburg-for-basic-hull-work-as-russias-lacks-northern-dock/432778>

