

MARCH 2020

AMERICA'S ARCTIC MOMENT

Great Power
Competition
in the Arctic
to 2050

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CSIS

CENTER FOR STRATEGIC &
INTERNATIONAL STUDIES

EUROPE
PROGRAM



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A Report of the CSIS Europe Program

ABOUT CSIS

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For the past decade, the CSIS Europe Program has researched, examined, and assessed geopolitical developments in the Arctic and its implications for U.S. national security. In many ways, this report is the culmination of our work. The following report utilizes the framework of the 2017 U.S. National Security Strategy (NSS) and subsequent National Defense Strategy (NDS) and the lens of great power competition to assess how the Arctic will evolve geopolitically to 2050, including its implications for U.S. interests. This report and its associated publications are designed to spur new thinking and debate about the Arctic in the United States.

Our level of ambition for this report is a testament to the talents and dedication of our team at CSIS as well as the small but active Arctic expert community. To the dozens of government, think tank, private-sector, academic, and environmental colleagues who generously gave their time and insights to attend two workshops and exchange views during private meetings, we say thank you. Your perspectives were extremely valuable and sharpened our final analysis.

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CONTENTS

ACKNOWLEDGMENTS	iii
EXECUTIVE SUMMARY	1
The United States Recognizes Great Power Competition in the Arctic	1
Russian Military Developments in the Arctic Pose the Most Significant Challenge to U.S. National Security	2
Understanding the Implications of China’s Growing Maritime Presence in the Arctic	3
Arctic Energy and Economic Developments	4
Mapping America’s Return to the Arctic	4
1. INTRODUCTION	7
Revitalizing the Red Arctic	7
Background: Separating Arctic Fact from Fiction	9
Russian Visions for the Arctic	10
Russia’s Military Vision for the Arctic	11
Chinese Visions for the Arctic	13
Implications for the United States	17
2. NEAR-PEER COMPETITOR MILITARY POSTURE IN THE ARCTIC TO 2050: <i>THREE SCENARIOS</i>	20
Russian Military Scenarios	21
Baseline Plus: A2/AD and Power Projection	22
China’s Dual-use Military Strategy for the Arctic	24
A Collaborative Sino-Russian Arctic Military Strategy	25
3. ARCTIC ECONOMIC DYNAMICS TO 2050	26
Energy Development Scenarios for the Russian Arctic	26
Low-intensity Development Scenario	27
Medium-intensity Development Scenario	28
High-Intensity Development Scenario	29
Markets versus State Support	29
China’s Role	30
Value, Strategy, and Context	31
Scenarios for Arctic Hydrocarbon Development to 2050	32
4. MAPPING AMERICA’S RETURN TO THE ARCTIC: <i>HOW TO RESTORE U.S. PRESENCE AND LEADERSHIP TO A STRATEGIC REGION</i>	33
The Arctic Equation: Presence Equals Influence	33
Pillar 1: Increasing U.S. Diplomatic and Security Presence in the Arctic	34
Pillar 2: Strengthening Science, Research, and Sustainable Economic Opportunities	35
CONCLUSION	36
ABOUT THE AUTHORS	37

Executive Summary

In July 2018, CSIS embarked on a major analytical assessment that centered on the following research question:

What will be the strategic consequences for the United States by 2050 if America's two near-peer military competitors, China and Russia, continue to develop their long-term economic and security interests in the Arctic, but the United States does not?

Our analytical framework was to understand future economic and military competition in the Arctic through the lens of the 2018 U.S. National Security Strategy (NSS) and National Defense Strategy (NDS), commonly referred to as great power competition. Would decades-long investments in the Russian Arctic be economically and militarily beneficial to Russia's long-term interests or a gross strategic miscalculation that would rapidly drain its national budget? Would China's initial economic and scientific investments in the Arctic have a long-term strategic effect on the United States? And, would America's two near-peer competitors contemplate joining their considerable economic and military forces in the Arctic to alter the balance of power in order to diminish or outright challenge U.S. homeland defense and deterrence capabilities?

At the start of the research period, the U.S. policymaking community was largely uninterested in the Arctic from a strategic standpoint, although members of Congress raised important questions about U.S. defense capabilities and economic investment policies toward the region in response to an increase in Russian and Chinese activities. Despite producing numerous U.S. Arctic defense strategies, successive administrations had perfected the art of resource allocation avoidance, which in turn produced a decade of U.S. Arctic inactivity as Russia and China proceeded to implement their Arctic economic and military policies. What would be the strategic consequences of prolonged U.S. Arctic policy stagnation? Given growing Russian and Chinese influence and strategic capability in the Arctic, what might be the strategic consequences by 2050 of prolonged U.S. Arctic policy stagnation?

THE UNITED STATES RECOGNIZES GREAT POWER COMPETITION IN THE ARCTIC

Near the midpoint of the research period, the U.S. policy environment dramatically changed when U.S.

Secretary of State Mike Pompeo gave a groundbreaking speech in Rovaniemi, Finland in May 2019. In the speech, Secretary Pompeo proclaimed that this was “America’s moment to stand up as an Arctic nation” and that “the region has become an arena of global power and competition.”¹ Secretary Pompeo’s speech was followed by the U.S. and Danish governments’ intervention to prevent the refurbishment of several airports in Greenland by a Chinese firm and by President Trump’s suggestion that the United States should purchase Greenland. As a reminder of its military strength, Russia conducted its largest strategic nuclear exercise in the Arctic (*Grom* or Thunder-2019) in October 2019 and a month later tested a hypersonic cruise missile from the White Sea. These events clearly situated the Arctic as a region of growing strategic importance.

Acknowledging rhetorically that the Arctic is a region of renewed strategic competition, however, does very little to develop and advance meaningful U.S. Arctic capabilities. The United States has some muscle memory from its strategic competition with the Soviet Union in the Arctic, but it is confounded as to how to simultaneously address two near-peer military competitors in the same region. U.S. Secretary of Defense Mark Esper has asserted that the United States must in fact prioritize its two strategic competitors, rather than confront them simultaneously, and has declared that, “China comes first and Russia second.” But in the Arctic in 2020, it is the opposite order: Russia is clearly first in terms of military capabilities, as well as in its economic ambitions, and China is clearly second. But what about by 2050? The great power competition framework fails to help facilitate an understanding of how the interaction between—and possible collaboration of—Russian and Chinese military activities in the Arctic would work against U.S. national security interests.

To understand the future of great power competition and dynamics in the Arctic to 2050, we examined the two drivers of great power competition in the Arctic: (1) military developments and (2) energy—the region’s primary economic driver. Utilizing 2020 as a baseline for development, we produced a series of economic and

military scenarios to understand the strategic implications for the United States.

RUSSIAN MILITARY DEVELOPMENTS IN THE ARCTIC POSE THE MOST SIGNIFICANT CHALLENGE TO U.S. NATIONAL SECURITY

The Arctic is essential to Russia’s military power, and its military developments in the region are by far the most advanced driver of great power competition. But in terms of capabilities, Russia has two Arctics—an East and West.

In Russia’s eastern Arctic, it has refurbished airfields, search and rescue capabilities, and radar stations to improve awareness in the air and maritime domains, which includes Sopka-2 radar systems on Wrangel Island (300 miles from Alaska) and Cape Schmidt.² These systems create a “protective dome” across Russia’s vast Arctic coastline and improve its overall operational ability to detect and track vessels and aircraft.

Russia’s military footprint transforms as one moves westward toward the European Arctic. The Russian military recently announced that it will increase the number of S-400 missile defense units deployed across its Arctic territory, which tracks with its recent deployment of more sophisticated equipment to defend its air and maritime domains. Kotelny Island and Novaya Zemlya, for example, are equipped with missile defense systems like the Bastion-P and Pantsir-S1 systems, which create a complex layered coastal defense arrangement that secures territory deeper into the central Arctic.^{3,4} Such capabilities strengthen Russia’s power projection capabilities in the Barents Sea and increase its ability to deny aerial, maritime, or land access to NATO or U.S. forces. Perhaps more worrying is what Russia is practicing (and signaling) through exercises like *Grom*-2019, which involved Russia’s strategic nuclear forces, all four of Russia’s naval fleets, 12,000 troops, and the launch

of two nuclear warheads in the Barents Sea, along with several other ballistic missiles.⁵ This military posture exceeds current U.S. posture across the region.

Russia's efforts to reconstitute its military posture in the Arctic are designed primarily for territorial defense purposes and protection of Russia's second-strike capabilities. But Russia's growing offensive capabilities, which are tested, exercised, and located in Russia's western Arctic, and which consist of hypersonic cruise missiles and precision-strike munitions, are designed to be undetectable by U.S. missile defense systems. Russia's modernized subsurface and surface naval presence, supported by unmanned underwater vehicles (UUV) and combined with its electronic warfare capabilities, will have a strategic effect on U.S. homeland defense.

Although we explore several military scenarios with varying levels of intensity and model their impacts on U.S. national security, we reach the same conclusion: the United States will not only lose its ability to access portions of the Arctic by 2050, but Russian advances in its anti-access/aerial denial capabilities in the Arctic will make U.S. costs of entry much higher. Perhaps more troubling, the United States remains increasingly vulnerable to growing Russian missile capabilities based in the Arctic—both conventional and nuclear. This trend may increase in an era where international arms control regimes are on the decline.

UNDERSTANDING THE IMPLICATIONS OF CHINA'S GROWING MARITIME PRESENCE IN THE ARCTIC

China has described the Arctic as a new strategic frontier (alongside space and the seabed) where there was "undetermined sovereignty." This leaves one to assume that China's efforts in the Arctic will aim to preserve China's unfettered access to the international waters of the Central Arctic Ocean (CAO) and to construct a case for preservation of its sovereign rights to the re-

gion by means of discovery and by continual presence and influence.

While Russia's military developments in the Arctic are better developed and therefore must be prioritized, assessing China's future military posture in the Arctic is more of a speculative activity. By 2050, China will have a more expansive maritime presence in the Arctic—both subsurface and surface assets—largely under the guise of its dual-use economic and scientific presence. Chinese ice-strengthened LNG carriers, container vessels, and non-nuclear and nuclear-powered icebreakers will be active along America's Arctic coastline to transit either the Northern Sea Route or the Trans-Polar Sea Route. Whether or not China would weaponize these surface vessels is unclear, whereas it is likely that Russia will have more fully weaponized their icebreaker fleet. Assuming an intensification of joint military activities and exercises from 2020, we posit there will be greater interaction between the Chinese PLA and PLAN and the Russian military in the Arctic.

Although U.S. attention has been largely dedicated to Chinese infrastructure (e.g., airports, rail, undersea cables) across the circumpolar Arctic, the United States has not strategically contemplated Chinese subsurface activity in the Arctic or a longer-term surface presence through a growing fleet of nuclear and non-nuclear (and potentially armed) icebreakers. Nor has the United States contemplated what this means for the two U.S. defensive avenues of approach to North America through the North Atlantic and North Pacific, which could be more susceptible to nuclear threat and blackmail. A more significant Chinese naval presence in the Arctic would need to be sustained by greater Sino-Russian military collaboration in which Moscow not only accepts China's greater economic and military activity in the Arctic but also possibly exploits its relationship with Beijing to develop an anti-Western partnership in the Arctic. Should these dynamics prove correct, addressing a dual Russian and Chinese naval presence in the Arctic would necessitate a significant shift in military and technological resources on the part of the United States and its allies.

ARCTIC ENERGY AND ECONOMIC DEVELOPMENTS

Russia's continued development of energy resources in the Arctic is crucial to its future economic survival and its status as a greater power. Nearly 20 percent of Russia's GDP is produced in the Arctic and sub-Arctic regions, with approximately 75 percent and 95 percent of Russia's oil and natural gas reserves located in the north, respectively.⁶ Our energy scenarios project Russia's current energy production diminishing over time, which fuels Russia's need to become a global LNG player on par with the United States, Australia, and Qatar. Yet China's interest and investment in Arctic energy may be less expansive than commonly assumed. Despite Russia's generous equity concessions to Chinese energy firms on the Yamal Peninsula, Russia has assumed the risk of the development, and Chinese firms are rewarded with Chinese investment funds to develop Russian Arctic LNG. Russian Arctic energy is also only one of many energy sources that are needed to satiate China's long-term energy needs. In the most intensive energy development scenario, Russia could represent upwards of 20 percent of China's total energy consumption by 2050, emanating from both Arctic LNG and energy piped across Russia.

While seeking to ensure energy diversification, China's long-term economic interests are also driven by its desire to enhance its maritime access to the CAO and Arctic shipping routes as well as access to the region's protein sources. Despite the vast energy potential of Alaska, the United States remains largely agnostic regarding its future Arctic energy growth, despite the U.S. government's reopening of offshore and onshore oil and gas leases. While Alaska continues to contribute to America's "energy dominance," its Cold War rationale to help maintain U.S. energy independence is no longer justified with the advent of unconventional oil and gas resources in the continental United States. Assuming moderate energy prices in the future, a moderate increase in U.S. energy exports from Alaska, and limited Alaskan energy infrastructure, America's Arctic energy resources will not be robustly developed over the next

30 years. However, the Arctic coastline and territorial waters will increasingly see Chinese ice-strengthened LNG carriers traversing the narrow Bering Strait on the way to the Russian Yamal Peninsula.

MAPPING AMERICA'S RETURN TO THE ARCTIC

Data analysis, satellite imagery, and scenario development demonstrate the continued growth of Russian and Chinese military and economic presence in the Arctic and heighten the sense of stasis in the U.S. military and economic presence. Unless the United States wishes to lose access to portions of the Arctic and have increasingly diminished capabilities to defend and deter attack against the homeland from the North Pacific and North Atlantic, the United States must return to the Arctic. The U.S. Coast Guard frequently notes that physical presence in the Arctic equals influence. Presence can take the form of a heavy polar security cutter, a deep-water port, a scientific observation center, a sustainable economic investment, or a significant investment in a diplomatic outcome in a multilateral negotiation format.

The optimal way to enhance American influence in the Arctic is for the United States to pursue all of these goals in the Arctic. This will require the development and positioning of increased U.S. security and infrastructure assets, a significant increase in U.S. Arctic diplomatic presence and activity, the strengthening of *in situ* science and research, and the promotion of economic opportunities across the circumpolar Arctic, as well as a reorganization of the U.S. government to restore American leadership in the region.

A new policy approach should focus on:

1. Increasing U.S. Arctic Diplomatic Presence: The United States should bolster its diplomatic presence by increasing the number of U.S. consulates and American diplomatic posts in fellow Arctic Council and other truly near-Arctic states. This

includes Canada, Denmark, Norway, Sweden, Finland, Iceland, and the United Kingdom. This also includes a more robust diplomatic outreach to Russia within the framework of the Arctic Council and coastal states. With a more robust diplomatic presence, the United States should:

- a. Initiate annual meetings of the foreign and defense ministers of the eight Arctic Council nations, outside of the Arctic Council venue;
 - b. Promote more frequent meetings of the five Arctic coastal states to discuss management of the CAO; and
 - c. Facilitate the organization of informal Arctic coalitions within major international organizations and multilateral fora to highlight Arctic initiatives.
2. Creating a Multiyear Arctic Security Initiative (ASI): From a security and defense perspective, the United States must budget the necessary resources to enhance its presence in both the North American and European Arctic. Just as the United States has responded to Russia's military posture in Eastern Europe through a series of bilateral defense enhancements funded in part by the European Deterrence Initiative (EDI), the United States should create an Arctic Security Initiative, or ASI.
 - a. The ASI would fund Arctic public-private infrastructure projects to further domain awareness and safety. Projects might include a deep-water port in the American Arctic, additional Coast Guard forward-operating locations in Alaska, refurbished hangars for air assets, and improved telecommunications systems.
 - b. The ASI could fund greater exercises and training in the Arctic, to include search-and-rescue, oil spill response and cleanup, and protection against IUU fishing, all while utilizing the North Pacific, North Atlantic, and Arctic Coast Guard forums.
 - c. The ASI would fund additional polar security cutters and ice-strengthened surface vessels, reinforce existing reception facilities along Greenland's west coast, and develop limited reception facilities and sensor capabilities along Greenland's east coast to enhance anti-submarine warfare capabilities in the GIUK gap.
 - d. The ASI could support enhanced satellite communications, UUVs, additional Arctic sea floor mapping, improved weather and ice floe monitoring, and a comprehensive automatic identification system to monitor increased vessel traffic, with a particular focus on LNG carriers traversing the narrow Bering Strait.
 - e. Funds could also be used for a layered homeland defense design, the increased deployment of strategic forces with short-duration rotational deployment of bombers, and investment in upgraded sensors for indications and warnings.
 - f. Funds could be directed toward enhancements to Thule Air Force Base, such as upgrades to the early warning missile defense radar in Greenland, as well as the eventual modernization of NORAD's air, radar, and satellite systems, as part of enhanced Arctic air and maritime awareness and preparedness.
 - g. Funds could also be used to address infrastructure damage caused by climate impacts, such as permafrost thaw and coastal erosion.
3. Creating an Arctic Science and Sustainable Economic Fund: The United States must leverage its strength in Arctic science. This includes the robust and world-renowned U.S. scientific network of institutions and scholars. The budget specifically for Arctic science and research should increase, particularly as it relates to the physical location of observational research infrastructure and expanded research campaigns across the circumpolar Arctic. Crucial to these efforts is the inclusion of indigenous voices, whose knowledge and experience in the region are invaluable. Along the lines of the ASI, the United States should create an Arctic Science and Sustainable Economic Fund (ASSEF) to accomplish a number of goals:
 - a. Increase the number of U.S. research stations based in the Arctic. Currently, the United States has only three research stations: two

- in Alaska (Toolik and Barrow [Utqiagvik]) and one in Greenland. Only two of these are operational year-round;
- b. Facilitate public-private partnerships with the fishing, tourism, and shipping industries to increase observational coverage and improve domain awareness in close coordination and cooperation with indigenous communities;
 - c. Support resiliency in indigenous communities and support coastal village relocation, as well as water, sanitation, affordable energy, and mental health needs; and
 - d. The ASSEF would also support the development of sub-regional trade and investment activities for both the North Atlantic Arctic region (including New England, Canada's maritime provinces, Iceland, Denmark, and the United Kingdom) and the North Pacific region (including Alaska and Canada's Northwest Territories).
4. Supporting International Norms and Agreements: Internationally, the United States should lead in promoting new and supporting established international norms and agreements in science and sustainable practices. This includes:
 - a. Enhancing U.S. scientific engagement and funding in the biodiversity of the CAO, with particular focus on the 5+5 fisheries moratorium's "Joint Program of Scientific Monitoring" to further study the CAO's ecosystem and activities related to enhancing biodiversity beyond national jurisdiction (BBNJ); and
 - b. Utilizing the Agreement on Enhancing International Arctic Scientific Cooperation to establish other norms and regulations that are grounded in science and preemptively protect the region. Doing so would establish transparency and norms related to scientific collection, data monitoring, and analysis. It would facilitate access to key research, particularly in the Russian Arctic.
 5. Organizing for Success: A reorganized U.S. government that prioritizes the Arctic and oversees its physical restoration will be better positioned to protect and promote U.S. national security interests in the region. Until Washington adjusts its posture, it will continue to have limited capabilities to address Russia and China's growing presence. We recommend that the U.S. government establish or alter several senior positions across the national security community, to include:
 - a. Creating a senior director for the Arctic at the National Security Council;
 - b. Renaming the assistant secretary of state for the Bureau of European and Eurasian Affairs to the Bureau of European, Eurasian, and Arctic Affairs;
 - c. Establishing a deputy assistant secretary of defense for Northern European and Arctic Affairs in the Office of the Secretary of Defense; and
 - d. Creating a senior civilian leader position in the Department of Homeland Security that is tasked with focusing on protecting America's Arctic.
- Similarly, the United States must update its current Unified Command Plan (UCP) for the Arctic region. The current UCP for the Arctic has overlapping combatant command responsibilities and different perceptions of threat (if there are perceptions at all) as it relates to the Arctic area of responsibility. As a result, each develops different strategies generating different requirements to counter their perceived threat. Consideration should be given to a separate or sub-regional command that better integrates the three U.S. COCOMS—USNORTHCOM, USINDO-PACOM, and USEUCOM—and introduces the capabilities of USSOCOM.
- If this is truly "America's moment to stand up as an Arctic nation," then all efforts must be made to ensure that the United States has both physical presence and influence in the region to defend the homeland and ensure continued access to the region.

Introduction

Over the past decade, there were two geographically consequential dates for the Arctic. The first was May 28, 2008, when the five Arctic littoral states—Russia, Canada, Norway, Denmark, and the United States—signed the Ilulissat Declaration, which reaffirmed that the Arctic would be governed by the UN Convention on the Law of the Sea (UNCLOS). It also gave the strongest rights to littoral states (which is particularly important to Russia, the largest Arctic littoral state) on issues such as the delineation of the outer limits of the continental shelf, the protection of the marine environment (including ice-covered areas), freedom of navigation, marine scientific research, and other uses of the sea.⁷ A year prior, however, Russia restarted its missile tests, strategic submarine patrols, and long-range bomber flights over the Arctic. The resolve of the five littoral states gave way to the second consequential date, May 15, 2013: the day that China became a permanent observer to the Arctic Council, an intergovernmental forum designed to protect the Arctic's environment and explore sustainable development. From this date, China, a self-declared “near-Arctic state,” substantially accelerated its economic and scientific presence across the circumpolar Arctic, and in subsequent years, China has started to collaborate with Russia in military exercises in the Arctic.

REVITALIZING THE RED ARCTIC

For the first 15 years of the post-Cold War era, the Arctic ceased to be a strategic asset for Russia, but this dynamic changed in the 2007-2008 timeframe, as Russia re-prioritized the Arctic as a national imperative, to keep with Vladimir Putin's desire to return Russia to its great power status. Russian domestic and Arctic policies have since gone through three distinct phases in response to developments in global energy supplies, evolving security dynamics, and new regional political realities.⁸

The Arctic is essential to Russian economic and military survival. Nearly 20 percent of Russia's GDP is produced in the Arctic and sub-Arctic regions, with approximately 75 percent and 95 percent of Russia's oil and natural gas reserves, respectively, located in the north.⁹ As a result, Russia prioritizes the development of Arctic natural and mineral resources; the promotion of the Northern Sea Route (NSR) through infrastructure projects such as icebreakers, ports, and search-and-rescue stations; and the reconstitution and construction of military installations in remote regions, such as Alexandra Land and Wrangel Island. Russia has allocated trillions of rubles over the past decade to Arctic de-



velopment, with the government declaring that it will spend approximately \$63 billion by 2020. In April 2019, President Putin announced that Russia will prepare an Arctic Development Strategy for 2035 to: increase cargo shipment to 80 million tons along the NSR by 2025; expand the country's icebreaker fleet to 13 heavy icebreakers by 2035 (nine of which will be nuclear powered); and propel investments in the expansion and upgrading of ports and infrastructure along the NSR.¹⁰ In December, Russia's Ministry for the Development of the Russian Far East and the Arctic announced that it expects around \$235 billion to be invested in the Arctic as part of this strategy.¹¹

Due to the imposition of U.S. and European sanctions in 2014 following Russia's illegal annexation of Crimea and military incursion into Eastern Ukraine, and the substantial delay in reorienting Russia's energy mar-

kets toward Asia, Russia has turned with some urgency to China as an alternative source of long-term financing and technology to aid the energy and infrastructure development in its Arctic region. This has in turn deepened China's pursuit of its Arctic economic ambitions at the exact moment when Beijing has accelerated its global economic ambitions, under the auspices of its Belt Road Initiative, and its regional goals in the Arctic—through its Polar Silk Road Fund.

China's movement into the Arctic was both strategic and opportunistic, seeking alternative shipping routes to the Straits of Malacca as well as new energy and fisheries resources. China took advantage of Russia's financial shortcomings, the precipitous drop in global energy and commodity prices, as well as its broader engagement with the Arctic Council, and its economic diplomacy with individual Arctic Council states. By 2015, China described the Arctic as a new strategic frontier (alongside space and the seabed) where there was "undetermined sovereignty" ripe for a "win-win" outcome. China has worked purposefully to ensure unfettered access to the Arctic's resources and international waters through its growing physical presence across the region and through its role in international fora. As a result, China has gone from being a minor player in the Arctic, opening its first scientific research station on Svalbard in 2004, to playing a significant role in shaping the region's future.¹²

It was therefore a convergence of economic and political interests that led to accelerated Russian and Chinese cooperation in the Arctic, which is most clearly manifested in the Yamal LNG Project. The Chinese National

Petroleum Corporation (CNPC) has invested heavily in the Russian energy firm Novatek and its \$27 billion liquefied natural gas (LNG) plant on the Yamal peninsula, Russia's Arctic crown jewel in energy. Chinese firms own 29.9 percent of the first project and are expanding investment in the Yamal LNG-2 project.^{13,14} To promote exports from Yamal, Russian President Vladimir Putin has suggested that the NSR would be part of China's Maritime Silk Road, creating a "global and competitive route that connects Northeastern, Eastern, and South-eastern Asia with Europe."¹⁵

China's increased physical presence in the Arctic, combined with Russia's growing economic and military ambitions in the region, underscore that both nations have long-term strategic designs for the region. It is unclear, however, whether their Arctic ambitions can be integrated to reshape the region to suit their collective strategic interests. Conventional wisdom suggests that the Russian strategic community, as well as heightened Russian nationalism, will prevent greater Russian dependency on China, but all conventional wisdom should undergo rigorous analytical stress testing. Thus far, Moscow and Beijing's policies have not challenged the Arctic's governing institutions, but there is evidence of some institutional and normative boundary testing, particularly emanating from Russia's military and grey zone activities and China's dual-use infrastructure. Regardless of the intention, the high-level focus and realization of China and Russia's Arctic ambitions result in the steady diminishment of U.S. influence in the Arctic.

BACKGROUND: SEPARATING ARCTIC FACT FROM FICTION

What makes the Arctic a particularly challenging region to research and assess is the inability to separate perception from reality and fact from myth. For example, in 2008 the U.S. Geological Survey reported that the Arctic held 13 percent of the world's remaining undiscovered conventional oil and 30 percent of the world's gas re-

sources (most of these reserves are found within the exclusive economic zone, or EEZs, of the littoral states). Yet a decade later, this boon has not been realized. In 2013, the British company Cairn Energy abandoned its efforts off the coast of Greenland after its \$1.4 billion venture to uncover a portion of the estimated 25 percent of the world's remaining oil and gas reserves lying beneath the Arctic Ocean did not yield the predicted reserves.¹⁶ In August 2017, Norway's hopes of uncovering a large oilfield in the Korpffell Well, located in the Barents Sea, produced only small, non-commercial quantities of natural gas, and no oil.¹⁷ Royal Dutch Shell's six-year, \$7 billion odyssey in the American Arctic is another example where two attempts to drill for offshore oil in the Beaufort Sea of Alaska led to disappointment, first as operations were halted in 2012 after a drilling rig broke free and ran aground, and three years later, in September 2015, when Shell officially abandoned its investments in the American Arctic after failing to find enough crude to make further operations profitable. Shell's estimated loss was around \$4.1 billion in future earnings.¹⁸ These cautionary tales in Arctic energy development, in conjunction with depressed commodity prices, curtailed investor enthusiasm. Arctic LNG appears to be of greatest interest to investors, but even LNG development may be muted should prices remain low. If global commodity and energy prices rise, interest in Arctic energy resources may be renewed.

As sea ice extent recedes to record levels, there is interest in exploring the potential of new trans-Arctic shipping. The NSR, the Northwest Passage (NWP), and the Transpolar Sea Route (TSR) are increasingly discussed as future passageways for maritime commerce. Russian President Vladimir Putin announced in 2011 that the NSR would be a rival to the Suez Canal.¹⁹ An increasingly ice-free NSR may represent a shorter transportation route between Europe and Asia, depending on ice conditions and weather, potentially providing greater and quicker access to economies and reduced costs. For example, the NSR reduces East-West or West-East transit by 35 percent and fuel costs by hundreds of thousands of dollars, based on the price of fuel and ice conditions.²⁰ Yet complete trans-Arctic voyages through the NSR remain

minimal. There was a total of 27 transits in 2018, slightly up from a similarly low 19 in 2016.^{21,22} Unpredictable weather conditions and high insurance premiums and fees associated with the NSR's use have resulted in low volumes of traffic, limited to local re-supply vessels, destination transits, and scientific explorations that do not operate on strict timelines. Despite limitations, the Russian government has since allocated trillions of rubles to develop this Arctic waterway and the surrounding region, which includes initiating over 150 development projects, although the deadlines and funding for icebreakers, search-and-rescue stations, and ports have been substantially delayed.²³

An underappreciated Arctic economic resource of keen interest to both Arctic and non-Arctic states alike is protein. Thick, multi-year ice, fishing moratoriums, and regional fisheries organizations have kept commercial fishing in sub-Arctic and Arctic waters to a minimum. However, future assessments predict an abundance of protein in Arctic waters, which could drive growing demand from nations with large commercial fishing fleets. For example, Japan, South Korea, and China account for 45 percent of the world's high seas landed value between 2000 and 2010. If Spain and France are included (the EU countries with the two largest fishing fleets), that figure grows to 54 percent.²⁴ Additionally, portions of the Arctic Ocean's adjacent seas, such as the Barents Sea, saw steep increases in plankton, the base of the Arctic food web. For example, in 2016, there was a 35 percent increase in plankton from the 2003-2015 average.²⁵ The Bering Sea is similarly home to diverse sources of protein, including halibut, shrimp, scallops, squid, pollack, crab, cod, and salmon. The five Arctic littoral states and representatives from China, the European Union, Iceland, Japan, and South Korea (known as the "5+5" group) agreed to a legally binding accord (the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean) that places a 16-year moratorium on fishing in the Central Arctic Ocean (CAO) while scientific research is conducted to understand the future of marine life and resources.^{26,27} Although the agreement preemptively safeguards fish stocks on the high seas, fishing in the CAO remains a long-term ambition for many nations, particularly China.

RUSSIAN VISIONS FOR THE ARCTIC

Past Is Prologue: Russia's Economic Vision for the Russian Arctic

Soviet and Russian leaders have long had ambitions to harness the Arctic's potential. Under Stalin's leadership, the Communist party laid out a broad strategy in 1934 for developing the NSR, which ranged from building Arctic ports to developing local deer farms.²⁸ President Putin harkened back to this Soviet period of regional development by incorporating similar themes in his efforts to return Russia to its great power status. Russia's energy and economic future is oriented northward; the Arctic accounts for nearly 20 percent of Russia's GDP, 22 percent of its exports, and more than 10 percent of all investment in Russia.^{29, 30, 31} It is an enormous source of energy resources and revenue for Russia, accounting for two-thirds of Russian oil and gas.³² According to the Russian Academy of Sciences, "The Arctic's economic development (which is impossible without investment activity and various investment and social projects) is the most important component of social and economic development of Russia as a whole."³³

Much of Russia's economic activity focuses on developing the NSR as a viable alternative shipping route that will more directly connect Russian energy producers with Asia and global markets. The focus of Russia's investment is the Yamal LNG-1 project based in the Sabetta port on the Yamal Peninsula. The \$27 billion project, partially funded by Chinese investment, exported its first shipment in December 2017, and less than three months later, ships carried the first million tons of LNG through Arctic waters. Major Russian companies, including energy giants Rosneft and Novatek and mining firm Norilsk Nickel, are driving forces behind Russia's Arctic development. In December 2017, Rosneft and British Petroleum (BP) agreed to jointly develop oil and gas deposits in Russia's Arctic Yamal-Nenets region.³⁴ The development of the Kharampursky and Festivalny deposits is in its development phase, with an expected launch date of 2020. The estimated gas reserves amount to 1

trillion cubic meters, with an initial projected output of 11 billion cubic meters per year.³⁵ Igor Sechin, Rosneft's executive chairman and former Russian deputy prime minister, has focused these efforts to acquire production licenses and boost Rosneft's reserves of natural gas.³⁶ Similarly, Novatek committed up to \$47.6 billion in December 2017 for LNG projects in the Arctic as it seeks to become a dominant supplier from the region.³⁷ Novatek has since expanded operations, developing two new LNG projects in the Yamal region: the Arctic LNG-2, with a planned annual output of 20 million tons, and the Ob LNG, estimated to produce up to 5 million tons per year. Both plants are planned to be operational in 2023.³⁸ And with an expected increase in the production of nickel by 30 percent by 2030, Norilsk Nickel (Nornickel) opened a new terminal in Murmansk that will enable the company to double its Arctic shipments.³⁹

In developing the NSR, the Kremlin seeks to monitor and control regional maritime activity. In December 2018, the Russian government signed legislation that gives con-

trol of shipping through the NSR to Rosatom, a state-run nuclear group which oversees Russia's nuclear-powered icebreaker fleet, underscoring the importance of Russia's icebreaking fleet and its infrastructure, access, security, and shipping across the waterway. In March 2019, the Russian government imposed limits on foreign warships transiting the NSR, requiring 45 days' notice for voyages.⁴⁰ This new limitation runs counter to international maritime laws, as the majority of the international community views the NSR as an international passage, meaning freedom of navigation should be permitted.

RUSSIA'S MILITARY VISION FOR THE ARCTIC

Russia has also increasingly incorporated the region into its broader military and security strategy. Russia's historical Arctic narrative—of man conquering the forces of nature and of the relentless focus to achieve military and industrial progress—is a source of pride



for the nation and the Kremlin.⁴¹ President Putin has stated that Russia “won’t threaten anybody, but, using our advantages, of a territorial nature in this case, we will ensure the security of Russia and its citizens. In this sense, the Arctic region is extremely important for Russia.”⁴² In 2014, President Putin announced the creation of a new strategic command for the Arctic zone under the Northern Fleet. Several months later, the Russian military launched an unannounced large-scale military exercise that involved more than 45,000 Russian forces, 15 submarines, and 41 warships and practiced full combat readiness in the Arctic.⁴³ The Russian government has also announced the reopening of 50 previously closed Soviet-era military bases in the Russian Arctic, in addition to the new Arctic Trefoil military base on Franz Josef Land, unveiled in April 2017. The strategic Wrangel Island, which separates the Chukchi Sea and East Siberian Sea, was recently outfitted with a highly capable radar system.

While Russia reconstitutes its military presence in the Arctic—with a strong emphasis on its strategic nuclear submarine deterrent and increasing conventional ca-

pabilities based on the Kola Peninsula—it probes weaknesses in other Arctic nations’ air and maritime defenses. Arctic air and particularly sub-maritime incursions in the Baltic region, the North Sea, the Barents Sea, and the North Atlantic Ocean continue to increase. There is limited transparency regarding the reopening of the previously closed Soviet-era military bases and the deployment of Russian special forces along the NSR. While some of these forces can conduct search-and-rescue or oil spill response prevention operations, the deployment of S-400 surface-to-air missile systems to the Novaya Zemlya archipelago and the reported deployment to the Yakutian port of Tiksi in the Arctic Ocean cannot.

Russia conducts frequent military exercises to test its Arctic readiness and capabilities. The Northern Fleet conducted 4,700 exercises in 2017 and 3,800 test combat training exercises, as well as 148 exercises in 2018. Many of these were designed not simply to defend Russia’s Arctic territory, but to enhance power-projection capabilities and protect the New Siberian Islands near potential oil and gas reserves and along the NSR.^{44,45}



THE RUSSIAN MILITARY frequently exercises new Arctic capabilities. Vostok 2018 was a notable event not only for the sheer size and scale of mobilization—more than 300,000 troops, 36,000 tanks, and 1,000 aircraft—but also because it was the first time a Russian military exercise included Chinese military personnel. In previous years, such a large exercise was viewed as preparation for a possible conflict with China, but as relations with the West deteriorate, Chinese and Russian defense cooperation is intensifying.

More recently, and in August and September 2019, Russia's Northern Fleet conducted several exercises in the Barents and Norwegian Seas, one of which Norway's Chief of Defense Haakon Bruun-Hanssen described as Russia seeking to "protect its territory and its interests by deploying highly capable ships, submarines, and aircraft with the purpose of preventing NATO of operating in the area." The military drills involved 30 naval vessels and more than 50 aircraft.⁴⁶ Such exercises test Russia's expanding capabilities in the Arctic across a network of refurbished and newly constructed military posts.

Russia's expanding military footprint in the Arctic has caught the attention of the other Arctic nations as well as NATO. The United States has increased its military presence in Iceland and Norway. Denmark has altered its security approach to the Arctic, and NATO held a large military exercise in the fall of 2018 (Trident Juncture), centered around Northern Norway, and reconstituted, albeit in smaller form, a Joint Forces Command for the North Atlantic. With the exception of these demonstrable steps, neither the United States nor its allies have attempted to counter or respond to Russia's military positioning or its testing of new Arctic weapon systems.^{47,48}

CHINESE VISIONS FOR THE ARCTIC

China's Economic and Scientific Vision for the Arctic

China's emergence in the Arctic began with scientific exploration. As a signatory to the 1920 Spitsbergen Treaty (or Svalbard Treaty), China opened its first scientific research station in 2004 on Svalbard. In 2009, China created its Polar Research Institute and has since organized 10 Arctic scientific expeditions. In addition to the research station on Svalbard, China opened a science research station in Northern Iceland in 2018 and recently signed an agreement to establish a China-Russia Arctic Research Center (CRARC) in Russia. China's scientific agenda focuses on mid-latitude weather, changes in Arctic sea ice, and ocean acidification. During the 2010 International Year of the Polar Bear, China was a participant in the International Polar Year (IPY) research network. But it was the invitation to become an observer to the Arctic Council in 2013 that accelerated China's scientific and diplomatic presence in the Arctic.⁴⁹ That same year the *Yong Sheng*, a Chinese container vessel, sailed from China to Europe through the NSR rather than the Suez Canal, saving nearly two weeks in travel time (taking 35 days rather than 48).⁵⁰ The Chinese shipping company, COSCO, has also conducted numerous transpolar sea voyages. During the five-year period since its first voyage in 2013, the company has successfully conducted 22 transits.⁵¹

The animating force driving China's Arctic policy is a desire for the Arctic states to acknowledge China's rights under international law and, therefore, its equality to the Arctic states regarding its continued access to the high seas of the Central Arctic. China has stated that its role in the Arctic is one of respect, cooperation, and win-win activity.⁵² China took a significant step toward actualizing its Arctic ambitions when it specifically mentioned its development of a "blue economic passage" that will promote trade "to Europe via the Arctic Ocean" as part of its Belt and Road Initiative.⁵³ The announcement emphasized China's willingness to



“The Xue Long (“Snow Dragon”) is China’s first ice-breaking research vessel. The ship has made scientific and research expeditions to both the Arctic and Antarctic. The Xue Long 2 was completed in 2019.

STR/AFP via Getty Images

explore for potential resources while also “encouraging Chinese enterprises to take part in the commercial use of the Arctic route.”⁵⁴ Now that the Arctic is under the auspices of Beijing’s Belt and Road Initiative, the region is included in China’s global economic governance strategy, which allows the world’s second-largest economy and largest developing country to engage the Arctic region with a “clear-minded, self-confident, and self-controlled strategic leadership role in the world.” With the release of its first Arctic white paper in January 2018, China has increased its scientific and economic footprint in the region, which could “upset the global balance of power.”⁵⁵

With China’s announcement in January 2018 to expand its Belt and Road Initiative to the Arctic, the Polar Silk Road was launched.⁵⁶ Shortly after, in September, China

launched its second non-nuclear polar-class icebreaker, the *Xue Long 2*, the first to be domestically built. China now has two polar-class icebreakers, matching the United States in terms of operational capabilities, further boosting Chinese confidence in future Arctic transit. China has also announced plans to construct a nuclear-powered icebreaker, which would make it only the second country after Russia to have one in its inventory. Such technology could allow China to remain operationally active in the Arctic for extensive periods of time.⁵⁷

Having secured access to the Arctic and increased its scientific and economic presence, China now seeks to diversify its energy, transit, and protein sources through the financing of Arctic infrastructure. The most notable example is Chinese investment in the Russian

Port of Sabetta and the Yamal LNG Project along the eastern coast of the Yamal Peninsula. Two Chinese banks, the Export-Import Bank of China and the China Development Bank Corporation, have signed two 15-year credit lines for approximately \$10.7 billion and \$1.5 billion, respectively. China's Silk Road Fund also provided approximately \$1.2 billion in funds in support of this project. The CNPC owns 20 percent equity in the project, while the Silk Road Fund owns 9.9 percent, giving Chinese companies 29.9 percent ownership over what could be the largest LNG project in the world.⁵⁸ In April 2019, two Chinese companies agreed to purchase a combined 20 percent stake in Novatek's Arctic LNG-2 project.⁵⁹ There is speculation that a Yamal LNG-3 could follow. Investments on the Yamal Peninsula are considered "anchor" projects, which are designed to establish an initial commercial presence that will eventually support other related "cluster" infrastructure investments (such as rail, telecommunications, and tourism related infrastructure). The success of the cluster approach can be found in the development of the nearby Gydan Peninsula, Obskoye LNG, and the Northern Latitudinal Passage project.

China has bilateralized its policy approach to the Arctic Council member states, with particular focus on the country that holds the two-year rotating chair of the Arctic Council. This was true during the very end of the U.S. chairmanship (2015-2017), when Chinese President Xi Jinping made an unanticipated stop in Alaska in April 2017 to meet with then Alaskan Governor Bill Walker. The meeting resulted in President Xi and President Trump signing a five-party Joint Development Agreement (JDA) worth an estimated \$43 billion, which would develop and export Alaskan LNG to China. The deal would have involved three of the largest Chinese energy and finance companies—Sinopec, the Bank of China, and the China Investment Corporation.⁶⁰ However, the state of Alaska has since declared that these investments will not move forward due to the significant risk the state would have to assume.⁶¹

China was also very active during Finland's chairmanship of the Arctic Council (2017-2019), during which

President Niinistö hosted President Xi Jinping for a state visit to establish and promote a future-oriented cooperative partnership deepening economic, trade, and investment ties within the "Belt and Road" framework.⁶² Emphasis was placed on infrastructure projects to enhance trade links between Arctic ports and mainland Europe in support of the expanding network of Arctic shipping routes where China seeks to develop commercial opportunities. This includes a rail line linking the southeastern Finnish city of Kouvola with Xi'an and Zhengzhou in Central China and proposed further expansion to cities in Norway and Sweden, making Northern Europe a central hub for future Arctic development.⁶³ China is also in talks with Finland, Norway, and Russia to lay a 10,500 km high-speed telecommunications cable connecting Europe to Asia across the Arctic Ocean, which would likely be implemented by the China Telecommunications Corporation, a state-owned enterprise, in cooperation with the Chinese Ministry of Industry and Information Technology.⁶⁴ The project is moving forward and a memorandum of understanding was signed between the China Telecommunications Corporation and the Russian company MegaFon in June 2019 to establish a "Development Company" by the end of 2019.⁶⁵ One can also see China's "anchor" and "cluster" strategy play out across Southern Europe (e.g., the Greek port of Piraeus) and the Western Balkans (e.g., via rail and energy infrastructure).

The current chair of the Arctic Council (2019-2021) is Iceland, where Beijing has enjoyed sustained commercial engagement since the Icelandic economy collapsed in 2008. In 2013, Iceland became the first European nation to sign a free trade agreement with China, and China has since injected substantial investment into the country. The China National Offshore Oil Company (CNOOC) has a 60 percent share in the venture operating two of Iceland's potential oil and gas shelf sites—Dreki and Gammur.⁶⁶ Despite Chinese property tycoon Huang Nubo's failed attempt to purchase a 115-square mile Icelandic farm for \$8.8 billion in 2013, Mr. Huang summarized China's ambitions for the region as the following: "our commitment in Nordic countries is not changed. We plan to enter one or two countries first

and then expand to the rest of Northern Europe, while we don't mind waiting for Iceland."⁶⁷ Beijing will hope its close relationship with Iceland will translate into increased Arctic engagement as Iceland holds the chairmanship of the Arctic Council until 2021. China clearly views Iceland as an "anchor" investment and as a key logistics hub for a future Transpolar Sea Route (TSR). It should also be noted that the next country to chair the Arctic Council will be Russia (2021-2023), which could be an opportunity to highlight growing Sino-Russian Arctic cooperation.

The need for greater economic investment was what also drew the Greenlandic self-rule government toward China as early as 2005. China has focused on the exploration of mineral resources in Greenland, with a specific interest in rare-earth metals. In September 2016, Shenghe Resources bought a stake in Greenland Minerals and Energy with an eye on developing rare-earth elements as well as uranium and zinc.⁶⁸ In 2015, a Chinese mining firm, General Nice, announced plans to develop a \$2 billion iron ore mine in Greenland. While efforts to develop the mine were ultimately put on hold due to low commodity prices, the purchase came only a few years after plans by a Chinese property developer to buy a large but remote tract of land in Iceland was rejected.⁶⁹ While the size and scale of these announced investments are impressive, there is not much on-the-ground evidence of Chinese economic activity in Greenland. Interestingly, however, many of these agreements are tied to the expansion of economic relations into areas such as seafood, which is already Greenland's number one export to China. In 2017, 97 percent of Greenland's exports to China were seafood products, including crustaceans and non-fillet frozen fish, totaling approximately \$132 million dollars.⁷⁰ Prime Minister of Greenland Kim Kielsen led a delegation to China in 2017 seeking to increase cooperation in fisheries, among other economic sectors.⁷¹

But what has attracted the most attention of U.S. policymakers was the announcement in 2018 that Chinese companies were shortlisted to refurbish three airports in Greenland. These bids propelled the United States

and Denmark to declare the airport project a matter of foreign and security policy, for which Copenhagen has authority. The overarching concern was that Chinese potential dual-use investments could place America's northernmost air force base, Thule Air Force Base, and U.S. advanced missile defense radar housed at the base at risk. After Danish intervention, Greenland authorities selected Denmark as the partner of choice to upgrade the airports, but the intervention resulted in the collapse of the Greenland government due to differences over the airport bids. The United States subsequently signed a state of intent with Denmark to facilitate additional U.S. government support.⁷² It should be noted that Arctic infrastructure upgrades will become a near permanent fixture, not only to meet the needs of increased human and commercial activity but also due to extensive damage caused by permafrost thaw. For example, it was recently announced that Greenland's main airport will close in five years due to runway damage caused by permafrost thaw, requiring a new airport to be constructed.

Chinese investment in the Canadian Arctic has followed similar patterns but overall has been more muted. Priorities include resource development, including in mineral resources, oil, and gas, as well as the opening of new Arctic shipping routes, notably the NWP. China has invested in mines in northern Canada, including the Nunavik Nickel Mine near Deception Bay, in Nunavik, Quebec. Beijing has also tested the shipping potential of the NWP. In 2017, the Chinese icebreaker *Xue Long* returned to Shanghai after completing its first circumnavigation of the Arctic, where it traversed the NWP through the Canadian Arctic Archipelago.⁷³ While the NWP does not currently offer the promise of either the NSR or the TSR, the Chinese are testing all three routes for their potential, as well as testing Chinese ice-breaking technology. In October 2018, Ocean Network Canada confirmed that China installed four underwater monitoring devices built by the Sanya Institute of Deep Sea Science and Engineering, a unit of the Chinese Academy of Sciences.⁷⁴ The devices are less than 200 miles from Naval Base Kitsap in the Strait of Juan de Fuca and are part of a grid of marine sensors stretch-

ing north to the Arctic.⁷⁵ China had also sought to place a scientific research post in Northern Canada in 2015, but it was not approved by the Canadian authorities.⁷⁶

IMPLICATIONS FOR THE UNITED STATES

Strategic Implications for the United States of a Sino-Russian Dominated Arctic

Russia instinctively rejects non-Arctic states and organizations from deeper involvement and physical engagement in the Arctic. Russia nearly did not approve China's permanent observer status in the Arctic Council in May 2013. Later that year, Russian special border forces boarded, impounded, and initially declared an act of piracy (though these charges were later lowered) against a Greenpeace vessel from which activists attempted to scale a Russian oil platform in the Arctic. Russia also rejected the permanent observer status of the European Union in the Arctic Council. Russia's preferred diplomatic format is either the five Arctic littoral states, as represented in the Ilulissat Declaration, or, to a lesser extent, the Arctic Council. It is this understanding which feeds conventional U.S. thinking that China and Russia will not ultimately join forces or "share" the Arctic, but this assumption must be tested.

Russia pursues its economic ambitions in the Arctic largely through its own sovereign and increasingly nationalistic terms. But as Russia opens its Arctic to international investment, its perception of strategic vulnerability will increase, resulting in a deeper need to protect or ultimately close its Arctic territory through its enhanced military presence. This is the "duality" of Russia's policy toward the Arctic—of both "belligerence and practical cooperation"—is on full display.⁷⁷ Russia has demonstrated practical cooperation in the work of the Arctic Council, Arctic Coast Guard Forum, and in its interactions with the U.S. Coast Guard in the Bering Strait. For example, the Russian Federal Security Bureau (FSB) and U.S. Coast Guard work collaboratively during search-and-rescue operations and when policing ille-

gal, unreported, and unregulated (IUU) fishing in the Bering Strait. The United States and Russia introduced to the International Maritime Organization (IMO) a Vessel Traffic Management System for the Bering Strait, which came into force in December 2018. It is the first internationally recognized ship routing measure approved by the IMO for polar waters.⁷⁸ This follows efforts by the United States and other IMO members to secure a mandatory Polar Code, which took effect in January 2017.

But at the same time, Moscow increases instability by having more frequent military exercises, testing new hypersonic missiles, and conducting GPS jamming in the region, the latter of which jeopardizes civilian aircraft in Northern Europe. By repeatedly demonstrating a disregard for international norms, laws, and treaties near and around its borders, deploying missile defense systems on remote Arctic islands, bolstering its naval assets in the Arctic (including ice-capable corvettes armed with cruise missiles and Borei- and Delta-IV-class ballistic missile submarines), Russia demonstrates its belligerence. Most worrisome, however, was Russia's August 2019 Ocean Shield Exercise, where it demonstrated its bastion defense capabilities and a clear forward line of defense to secure the GIUK gap and block the English Channel; similar tactics were used nearly 10 months earlier when Russia seized the Kerch Strait, a narrow artery linking the Black Sea and Sea of Azov, which effectively closed the Sea of Azov.⁷⁹

With a vastly different approach, China has quietly and effectively used its economic weight, scientific activity (which influences future economic activity), and growing diplomatic presence (including activism in international organizations which influence Arctic policies). This so-called "multi-tiered Arctic cooperation framework for win-win results" is shaping Arctic policies and activities. China insists that its commercial activities "respect [for] the inherent rights of Arctic countries and the indigenous people."⁸⁰ Chinese government officials frequently note that all their Arctic activities are based on existing international law,⁸¹ yet they also underscore that the Arctic, as a "strategic frontier," has

“undetermined sovereignty.” Such statements implicitly suggest that clarity will only come with input from and agreement by Beijing.

China’s military presence is a relatively new phenomenon in the Arctic. It likely began with a small joint naval exercise in September 2015, when five Chinese navy ships were spotted in the Bering Strait off the coast of Alaska simultaneous to President Obama’s hosting of a major Arctic conference in the state, called “GLACIER” (Global Leadership in the Arctic: Cooperation, Innovation, Engagement, and Resilience with Chinese participation).⁸² In July 2017, a Chinese communications or intelligence vessel was detected off the coast of Alaska (approximately 100 miles) for several days.⁸³ By 2018, the Chinese military participated in Vostok 2018, and they took part in joint air operations in 2019.

What are the security implications of a Chinese nuclear-powered icebreaker in the Arctic, potential Chinese submarine activity and space-based assets, and growing Chinese ownership of Arctic port infrastructure? What would happen if Chinese and Russian forces continued to train and exercise in the Arctic to control the “avenues of approach” to the United States in both the North Pacific and North Atlantic? With scarce yet vital U.S. military assets and defense architecture in the Arctic, these are the scenarios that must be considered.

The United States and the Arctic: Marching in Place

Over the past decade, the United States has written a plethora of studies and assessments highlighting the dynamic changes in the Arctic. All of these studies, however, have yielded little in terms of updated capabilities other than constructing a polar security cutter (PSC) to replace an icebreaker that was commissioned in 1976. Furthermore, this one fully funded PSC will not be available until the 2024-2025 timeframe and will be principally used in the Antarctic. The United States continues to rely on outdated capabilities, a seasonal presence (July-October) in the American Arctic and thinly resourced budgets. Years of underinvestment leaves the United States ill-prepared in the

Arctic, as other nations prioritize the region as one of future geostrategic value.

However, 2019 was the year that the United States viewed the Arctic through the lens of great power competition and fully recognized the increased military and economic presence of Russia and China. This policy shift was encapsulated in Secretary of State Pompeo’s speech in Rovaniemi, Finland, as well as Washington’s “rediscovery” of the strategic importance of Greenland, prompted by China’s economic activity.

The United States government is slowly awakening to the idea that the Arctic is of geostrategic value, but far too slowly and without the necessary budget support, policy prioritization, and senior leadership to drive outcomes. While some U.S. officials may recall the rationale behind an enhanced U.S. force posture in the Arctic during World War II and the Cold War, these officials would never have contemplated China’s presence in the Arctic or a combined Sino-Russian economic and military presence that could severely impact U.S. interests.

U.S. military officials continue to express concern about the growing military challenges in the Arctic. Admiral James Foggo, commander of U.S. Naval Forces in Europe, warned that Russia is priming battlespace in the North Atlantic and Arctic. Lamenting a lack of U.S. presence in the region, he argued”

Russia has renewed its capabilities in the North Atlantic and the Arctic in places not seen since the Cold War . . . The improved capability of Russia to be able to project power into this region and these strategic routes from the Arctic into the North Atlantic and the GIUK Gap is something that we need to pay particular attention to.”⁸⁴

Similarly, the Alaskan congressional delegation continues to voice strong concerns over the lack of both U.S. policy focus and national assets to defend U.S. interests in the Arctic.

As a result, the pace of U.S. investments at Fort Greely has accelerated since 2013, primarily in response to

a series of missile tests by North Korea and includes \$200 million from Congress to add a fourth missile field. The recently released U.S. missile defense strategy also increases the number of ground-based interceptors at Fort Greely from 44 to 64 over the next several years, but there are concerns after the Pentagon cancelled the contract with Boeing in August. Clear Air Force Station, just south of Fairbanks, Alaska will also be the site of \$325 million investment to install a new missile detection radar system.⁸⁵ Furthermore, Eielson AFB is projected to receive 54 F-35s between 2020 and 2022, increasing the capacity of the base, but these resources are dedicated to the Indo-Pacific region and not the Arctic.⁸⁶

Beijing and Moscow believe the Arctic will be very important to their strategic goals well into the future. Today, America is making the exact opposite bet.

Russia and China are implementing their Arctic strategies, dedicating economic resources and shaping the region toward their preferred outcomes and strategic interests. While both powers may be unable to fulfill their Arctic ambitions, they are raising the military stakes for the United States. In other words, Beijing and Moscow believe the Arctic will be very important to their strategic goals well into the future.

Today, America is making the exact opposite bet. Although Washington certainly worries about Russia and China's Arctic activities and strategic documents will continue to reflect their anxiety, the United States simply is not willing to take scarce resources and capabilities away from current priorities. For the foreseeable future, all things being equal, the United States will continue to lose economic and military access to the Arctic, which will further erode American power and

influence across the globe unless it chooses to increase its physical presence in the Arctic.

The following chapters lay out a fact-based examination of the issue and undertake predictive assessments of potential economic development and military build-up scenarios for the Arctic based on what we know today. It also projects several visions of Russia and China's Arctic ambitions to 2050. We conclude that the strategic gamble made by Russia and China in the Arctic will pay future geopolitical dividends, principally America's loss of control over and access to the "strategic avenues" of approach to the United States from the Arctic, jeopardizing the safety and security of the American people. There is time to stem the erosion of influence and to protect U.S. national security interests in the Arctic, but the window is closing rapidly. We hope the United States will bet on a different Arctic future.

Near-peer Competitor Military Posture in the Arctic to 2050

Three Scenarios

Based on our research, there are several potential scenarios to monitor:

1. RUSSIAN MILITARY SCENARIOS

Baseline

Baseline Plus

2. A CHINESE MILITARY SCENARIO

3. A RUSSIAN AND CHINESE COLLABORATIVE SCENARIO

As substantiated by satellite imagery in the previous section, the Russian military has the preponderance of military power in the Arctic. When considering Russia's future force posture in the Arctic, we developed two scenarios of varied military intensity. The first scenario is largely an extrapolation of what the Russian military currently has in the Arctic, accompanied by modest growth (in line with its announced ambitions) designed largely for territorial protection and defense of its second-strike nuclear capabilities. The second scenario envisions an accelerated and advanced Russian military presence in the Arctic in which its forces are largely designed

for global and regional offensive capabilities. Many of the elements in both scenarios are visible and active today.

A Chinese military scenario for the Arctic foresees an accentuation of the dual-use of its economic and scientific presence in the Arctic and draws upon China's behavior in the South China Sea to infer its future behavior in the Central Arctic Ocean (e.g., militarization of fishing fleet, demanding access to exclusive economic zones). Finally, we construct a 2050 scenario in which Russia and China collaborate militarily in the Arctic against U.S. interests, drawing upon existing Sino-Russian military collaboration through joint naval exercises, combined air operations in the Pacific, and Chinese engagement in the last two Russian annual military district exercises, Vostok-2018 and Tsentr-2019. This scenario is the most damaging to U.S. strategic interests.

Each scenario posits objectives for such military posture and outlines "wild card" events which could dramatically alter the basis of the scenario, such as a technological innovation or an environmental catastrophe that would impact military posture.

1

RUSSIAN MILITARY SCENARIOS

Baseline: *Integrated Air Defense and Anti-access/Area Denial*

Russia continues its construction of small military bases across the Russian Arctic, but the mission and character of its forces remain primarily focused on anti-access/area denial (A2/AD) capabilities. Russia's overarching objective is to project and protect its territorial sovereignty across its vast Arctic territory and monitor increasing international commercial traffic through the Northern Sea Route (NSR). Russian conventional and nuclear forces continue to focus on the Kola Peninsula. Its military adds additional numbers of long- and short-range air and missile defenses, as well as land-based coastal defense missile batteries, across the Russian Arctic. However, the cost and hardship of maintaining personnel in the Arctic lead Russia to pursue low-manpower or unmanned systems in the region, including the greater use of unmanned aerial vehicles and systems (UAV/UAS) for intelligence, surveillance, and reconnaissance (ISR). Russia further enhances its Arctic capabilities with greater force integration, con-

centrating on developing a common operating picture and network-centric fire control.

Focusing on integrating its regional air and missile forces by 2050 allows Russia to deploy next generation UAS to provide ISR on targets outside the radar field of view. Its communication nodes provide over-the-horizon, integrated fire control for its coastal and air defenses. This permits Russia to take fuller advantage of its air and missile forces deployed in the Arctic.

By 2050, Russian S-400 systems are established across the Russian Arctic and Russia deploys S-500 units to defend its Arctic positions. With a 600 km range, these systems increase the reach of Russian air defenses against high-altitude targets.⁸⁷ Russian interceptors for these systems are more autonomous and capable of over-the-horizon engagements in an integrated, over-the-horizon fire control network.

In 2050, Russia has positioned additional coastal defense units to support its extended outer continental shelf claims in the Arctic.⁸⁸ The latest generation of Russian anti-ship missiles can reach hypersonic speeds in excess of Mach 5. Weapons can strike maritime targets up to 300-400 kilometers away. Russia's Arctic air power presence in 2050 is largely composed of UAS deployed on remote air bases on Russia's most-northern Arctic islands, with its manned aircraft residing in its larger bases on the Russian mainland. Russia adopts a UAS-heavy approach to minimize its human footprint in remote areas.

From a maritime perspective, Russia continues to grow a more modern, stealthier, and more capable subsurface force which is capable of launching advanced (hypersonic) cruise and ballistic missiles. Russian naval forces will deploy more frequently along the Greenland-Iceland-UK-Norway (GIUK-N) gap. Moreover, Russia will continue to advance its Arctic surface fleet of icebreakers (increasingly armed with missiles) and ice-strengthened frigates across the NSR. While these actions aim to monitor and protect increased maritime traffic, the fleet could be deployed for offensive capabilities. Russia will continue to train and develop

ARCTIC REGION LONG-RANGE ARCTIC AAW EMPLACEMENTS IN 2050 (S-400/S-500 W/ SHORAD)

- Severomorsk
- Novaya Zemlya (Rogachevo air base)
- Franz Joseph Islands (Nagurskoye air base)
- Severnaya Zemlya (Sredny Ostrov air base)
- Kolteny (Temp air base)
- Tiksi
- Anadyr Ugolny

ARCTIC REGION COASTAL DEFENSE BATTERY EMPLACEMENTS IN 2050

- Novaya Zemlya (Rogachevo air base)
- Kolteny

special forces experienced in cold-weather fighting with specific Arctic kits, which could provide flexibility for grey zone activities in NATO members Norway and Denmark.⁸⁹

IMPACT ON U.S. STRATEGIC INTERESTS

Largely focused on integrated air defense, this scenario imposes economic and military costs upon the United States and its allies by limiting or deterring access to the Arctic. Russia's position further consolidates Russia's military dominance in the Arctic by attempting to partially reconstitute, with advanced missile defense and a smaller military footprint, its previous Cold War Arctic posture. Russia's significant enhancement of its A2/AD presence, coupled with its use of electronic warfare, complicates and likely reduces U.S. air and naval operations in the region, inhibiting advanced U.S. aircraft in the Arctic region and placing U.S. forces operating in the Arctic under increased Russian surveillance. As a result, Russia would have the ability to challenge and prevent freedom of navigation operations, U.S. military maritime traffic, and commercial vessel movement. The greater density of Russian air defense and use of electronic warfare may also pose a danger to civilian aviation over transpolar routes. U.S. forces operating in the Arctic could require significant operations to suppress Russian air and coastal defenses. Due to the resource intensity of such operations and limited U.S. capabilities in the Arctic, the United States may be forced to yield greater portions of the Arctic to its near-peer military competitors.

Baseline Plus: A2/AD and Power Projection

This scenario depicts Russia's further exploitation of its northern territories as a base for power projection and long-range precision strike. Building on its mostly defensive A2/AD capabilities outlined in the baseline scenario, Russia augments its military presence with deployments of mid-range cruise and ballistic missiles and places hypersonic glide weapons in range of U.S. and NATO military installations in the Arctic (Alaska and Greenland). Russia increasingly embraces unmanned systems on land, sea, and air to increase their

ARCTIC REGION INTERMEDIATE-RANGED GROUND-LAUNCHED CRUISE MISSILE DEPLOYMENTS

- Murmansk Oblast
- Anadyr Ugolny
- Wrangel Island
- Provideniya

ARCTIC REGION HYPERSONIC GLIDE VEHICLE MISSILE UNIT DEPLOYMENTS IN 2050

- Anadyr Ugolny

mobility for and resiliency against attack. Russia also improves its precision strike by improving the performance of its GLONASS satellite navigation system and augmenting gaps with land-based, long-range navigation (LORAN) installations.

ARCTIC PRECISION GUIDED STRIKE COMPLEX

In addition to the modernization of its nuclear submarine forces and weaponized icebreakers, Russian strike forces in 2050 would maintain numerous intermediate-range, ground-launched cruise missile (GLCM) systems and a limited number of hypersonic glide vehicles. By 2050, Russia has placed mobile GLCM units along its Arctic perimeter, with concentrations in Murmansk Oblast and Novaya Zemlya to provide an additional axis of attack against targets in Europe. It also deploys GLCMs on the Chukotka Peninsula to threaten U.S. forces in Alaska. Russia has also placed hypersonic glide vehicle missile units in Eastern Siberia, adding another dimension of threat to the U.S. home territory. As Russia deploys both nuclear and conventional variants of these systems, there exists considerable ambiguity as to the warhead payloads of those systems in the Arctic, rendering most negotiated arms control thresholds meaningless. With a minimal arms control framework that does not cover new weapon systems and reduced transparency, there is little the United States can do to mitigate these advances.

ENHANCED NAVIGATION

Satellite navigation systems are not optimally positioned for Arctic coverage. Systems that rely on satellite navigation, such as precision-guided munitions, may be less capable in the Arctic region. To strengthen its precision-strike complex in the Arctic, Russia continues to invest in non-satellite systems to augment its regional navigation apparatus with systems such as LORAN. Russia also invests in other more novel solutions such as High-altitude Pseudo Satellites (HAPS) to fill gaps in its GLONASS satellite systems, giving Russia a substantial advantage over its Arctic competitors while it increasingly blocks GPS capabilities.

DISTRIBUTED, RESILIENT POSTURE

To curb costs and better manage its demographic decline, Russia opts for low-personnel options in the Arctic, to include unmanned missile installations that can be queued via overhead ISR assets. Such installations are buried or otherwise embedded into the terrain to make spotting and targeting difficult. Russia also deploys strike assets on civilian vessels traversing the NSR. Russia has already developed anti-ship and land-attack cruise missiles disguised in shipping containers for this purpose.⁹⁰ These systems also include containerized sensor and C2 systems.

RUSSIA'S ARCTIC MARITIME AND EXERCISE COMPONENT

Although the preponderance of Russia's Arctic military posture focuses on integrated air defense capabilities, its offensive capabilities will be enhanced through its submarine-based nuclear deterrent and advanced missiles (greater precision and lethality of the Kalibr cruise missiles) placed on its surface fleet, to include icebreakers and ice-capable patrol vessels armed with anti-ship missiles. The baseline plus scenario includes a more robust undersea domain, particularly the deployment of deep-water unmanned underwater vehicles (such as Harpsichord-2R-PM). In this scenario, Russia overcomes its current limitations on ice-class platforms and develops significant communication redundancy through the laying of trans-Arctic fiber-optic cables. Russia's enhanced

Arctic maritime element, combined with a strong integrated air defense component, not only prevents the United States and allied forces from potentially accessing the Arctic, but Russia's undersea capabilities could substantially enhance its stealth offensive capabilities in the North Atlantic.

EFFECT OF RUSSIAN BASELINE PLUS SCENARIO ON THE UNITED STATES

A Russian precision-strike complex in the Arctic would impose additional costs on the United States above and beyond an A2/AD-only (baseline) posture. The prospect of increased conventional and nuclear Russian missile attacks originating from the Arctic region will compel U.S. combatant commanders to integrate the Arctic into their operational plans in the event of a conflict. The transpolar employment of long-range cruise missiles, for example, could increase the risk of strategic surprise by flying below U.S. early warning sensors. U.S. and NATO bases in Alaska and the United Kingdom would be more vulnerable to conventional air and missile attack. These threats would complicate North American and European missile defense capabilities. Air defenses in NATO would also need to account for additional potential attack vectors in the event of a conflict with Russia, further stretching these forces.

Countering this buildup would require investments to increase U.S., NORAD, and NATO situational awareness of aerial threats in the Arctic and the resiliency of forces there. Such investments would need to emphasize air- and space-based sensors for tracking cruise missiles and hypersonic glide vehicles, respectively. Air and missile defense systems in Europe would need to be reconfigured for 360-degree coverage. This includes better integration of aerial sensors into air and missile defense architectures and omnidirectional land-based radars. Such threats may further compel the United States to increase the survivability of its Arctic military facilities through deployment and hardening of active air and missile defense units at key bases.

2

CHINA'S DUAL-USE MILITARY STRATEGY FOR THE ARCTIC

Understanding China's potentially expansive military capabilities in the Arctic to 2050 requires understanding Beijing's long-term strategic perspective. This scenario's point of departure is China's current maritime capabilities, its military doctrine, and its widening geographic ambitions. Today, the Chinese People's Liberation Army Navy (PLAN) currently operates 6 nuclear-powered attack submarines, 4 nuclear-powered ballistic missile submarines, and 50 diesel attack submarines.⁹¹ Our scenario envisions a significant increase in China's naval inventory by 2050, which allows for an increased Chinese submarine and surface vessel presence in the Arctic. Although its naval forces primarily are designed for use in the first island chain and Indian Ocean, Chinese military literature continues to press for Beijing's maritime expansion into the polar seas.⁹² Its primary objectives would be to protect its nuclear deterrence from U.S. and Russian ICBMs (China's land-based nuclear deterrent currently maintains an Arctic trajectory), protect its Arctic resources (e.g., energy, fisheries, and shipping), and defend its equitable access and scientific interests in the Arctic (which support both its military and economic interests).⁹³

China's continued access to and role in the Arctic is supported by its increasingly accurate seabed charts, ice charting capabilities, and enhanced satellite communications in the region, all of which are financed by its scientific activities and its enhanced remote sensing capabilities. The expansion of China's satellite communications and cyber capabilities in the Arctic is supported by the growth and dominance of its global navigational system, BeiDou.⁹⁴ Currently, BeiDou's ground station in the Arctic is located near its scientific research station on Svalbard.⁹⁵ Significant elements of China's military presence in the Arctic will come under the guise of its scientific and economic presence.

China's first freedom of navigation operation was conducted in the American Arctic in 2015 near the Aleutian Islands and included three surface warships, a supply ship, and an amphibious vessel.⁹⁶ By 2050, Chinese submarines and its growing icebreaker fleet (both nuclear-powered and non-nuclear-powered) will spend considerable time in the Arctic Ocean, requiring the United States to focus on Chinese anti-submarine warfare in both the GIUK gap and Bering Strait. This would likely reduce U.S. assets in the Indo-Pacific and would necessitate an increase in Japanese anti-submarine warfare capabilities in Japan's archipelago. The PLAN will conduct military exercises with some frequency in

Significant elements of China's military presence in the Arctic will come under the guise of its scientific and economic presence.

the Arctic by 2050. Publicly, government officials will state this increased presence is to protect its growing fishing fleet in the Arctic Ocean after the 16-year moratorium on fishing in the Central Arctic was lifted due to sufficient scientific data (from studies funded by the Chinese government) and international scientific analysis indicating that the marine ecosystem could sustain it. China's military presence in the Arctic is also meant to protect its economic interests, particularly its shipping fleet of ice-strengthened LNG carriers and container vessels. The Chinese fleet increasingly uses ports and associated infrastructure in Arctic states that it has either developed itself or gained access to by pressuring foreign governments with the threat of trade sanctions. China enhances its satellite communications and lays additional trans-Arctic fiber-optic cables to enhance speed of classified communications.

Effect of Chinese Dual-use Scenario on the United States

The United States has not contemplated Chinese subsurface activity in the Arctic or a longer-term surface presence through a growing fleet of nuclear (and armed) icebreakers. U.S. attention has been dedicated largely to Chinese infrastructure (e.g., airports, rail, undersea cables) in the Arctic. It would be a significant shift in strategic resources for the U.S. military to simultaneously address both Russian and Chinese military presences in the Arctic, likely fueling demand for a sub-regional combatant command for the Arctic and a reallocation of military capabilities. This scenario would also increase pressure to bring China into a regulated arms control regime.

3

A COLLABORATIVE SINO-RUSSIAN ARCTIC MILITARY STRATEGY

A more significant Chinese naval presence in the Arctic would likely be sustained by greater Sino-Russian military collaboration. This scenario begins with the premise that to maintain its great power status and economic stability, Moscow not only accepts China's greater economic and military activity in the Arctic but also seeks to exploit its relationship with Beijing to develop an anti-U.S. partnership in the Arctic. Existing joint Sino-Russian economic and scientific activities (currently centered on energy exploitation and infrastructure development on the Yamal Peninsula), ongoing Sino-Russian annual maritime exercises, and Chinese participation in Russia's military exercises for specific military districts—like that which occurred in 2018 for the Vostok exercise and in 2019 for the Tsentr exercise—would be significantly increased.⁹⁷

This scenario envisions Russia leasing a select number of its Arctic ports to Beijing on very generous terms; China continues to develop the ports through its Polar Silk Road Fund and in return Russian Arctic ports could be used both by Chinese surface vessels and its burgeoning

submarine fleet. China also offers to lease Russian nuclear icebreakers, which Beijing uses for scientific purposes. Chinese scientists, trained by the PLA, deploy regularly to some of Russia's most remote Arctic islands, and Chinese companies are given preferential status on remote Russian Arctic islands to complete runways and hangar space. Chinese climate scientists would use these remote locations to conduct scientific research on fisheries management in the Central Arctic Ocean. Beijing offers to purchase Russian weapons systems and begins co-production of advanced air and missile defense systems.

These developments would rapidly transform the Arctic militarily and economically. Having been stymied by the United Nations Commission on the Limits of the Continental Shelf and subsequent bilateral negotiations—and needing to increase its exports of hydrocarbons for its economic future—Moscow makes a unilateral declaration to extend its outer continental shelf that extends to the North Pole. Beijing announces that it recognizes the Kremlin's 3-dash line in the Central Arctic Ocean, and Moscow in turn recognizes Beijing's 9-dash line in the South China Sea. Chinese and Russian naval and air assets are used to patrol the new division. The four Arctic coastal states and UN denounce the measures but do not militarily contest the measure.

Effect of Sino-Russian Collaboration Dual-use Scenario on the United States

This dramatic scenario describes military and economic domination of the Arctic by China and Russia, with a significant upheaval of international maritime law and undermining of the Law of the Sea Treaty. While it has always been understood that Arctic economic development requires regional stability, this scenario forecasts a different course wherein Russia and China by force determine the economic viability of the Arctic through domination of the sea lanes and resources. The United States and its allies would either need to respond to this dramatic shift with substantial military presence or cede control of the Arctic to Russia and China. The North Atlantic and North Pacific, the two "avenues of approach" to North America, would be highly exposed to nuclear threat and blackmail.

Arctic Economic Dynamics to 2050

ENERGY DEVELOPMENT SCENARIOS FOR THE RUSSIAN ARCTIC

Arctic economic dynamics and developments—from energy exploration and shipping to fisheries and telecommunications—will profoundly shape the future of great power competition in the Arctic, with energy development being particularly impactful. China’s demand for and diversification of energy sources over the next 30 years and Russia’s ability to maintain its energy exports will be a key determinant in how these countries perform economically and geographically. The Arctic is critical to Russia’s future economic development. For China, the Arctic is a needed but less critical source of energy, shipping, and protein diversity. For the United States, the Arctic no longer represents the economic necessity of energy independence it once did; in fact, the United States remains largely agnostic to Arctic economic developments as it shifts between environmental conservation and development. These dynamics are important to note, as the Arctic holds the largest repository of undiscovered hydrocarbons; the U.S. Geological Survey in 2008 estimated it contains over 400 billion barrels of oil equivalent

in recoverable oil and gas, a projection that recent studies have also reiterated.⁹⁸

In order to assess the impact of the Arctic’s energy resources on great power competition in the region, we developed three energy development scenarios for the Russian Arctic to 2050. The first scenario anticipates a more accelerated path toward achieving global decarbonization or carbon neutrality in which Arctic energy development is subdued. The medium- and high-intensity energy scenarios, our second and third projections, respectively, foresee a more significant role for Arctic energy resources driven by global energy demand and accompanied by the requisite technological and infrastructural development.⁹⁹

Advances in both energy and shipping technology, such as continued advances in ice-strengthened liquefied natural gas (LNG) carriers or the increasing use of nuclear-powered vessels, could also recalibrate these scenarios. Another so-called “wild card” would be a devastating environmental accident in the Arctic or other transformative event that has not been foreseen but would potentially dramatically alter the Arctic’s viability as an energy provider.

Although these scenarios focus exclusively on Arctic

China's demand for and diversification of energy sources over the next 30 years and Russia's ability to maintain its energy exports will be a key determinant in how these countries perform economically and geostrategically.

energy development as a key driver of Arctic economic development to 2050, greater Arctic energy demand will also generate additional Arctic infrastructure development as it relates to pipeline, port, ship, and rail construction. Climate impacts in the Arctic are already severely impacting port, road, pipeline, and onshore energy infrastructure development. Such infrastructure will be increasingly expensive and difficult to construct and maintain due to permafrost thaw and coastal erosion. These impacts are leading to infrastructure related experimentation and advances, such as Russia's concept of sub-Arctic commercial "depots," which cluster infrastructure development at key nodes that are less impacted (at present). While acknowledging both adaptation and wild card events, the following energy scenarios are the most realistic for Arctic development in our view.

LOW-INTENSITY DEVELOPMENT SCENARIO

A low-intensity development scenario for the Arctic coincides with an energy transition to low-carbon energy sources to keep temperature increases "well below" 2° C relative to pre-industrial levels. The "Sustainable Development" scenario of the International Energy Agency (IEA) describes this world.¹⁰⁰ Oil consumption falls by over 30 percent relative to 2018, gas demand rises

in the mid-2020s but then settles into a long plateau before declining, and LNG exports continue to grow, almost doubling by 2040. Gas demand in Europe, the main market for Russian gas today, is almost halved by 2040 (and declines further through 2050).¹⁰¹

In this scenario, there is little need for Arctic oil or gas (see table for a summary of each scenario). It is important to remember that oil and gas fields have a natural decline rate. Without new investment, oil and gas fields decline and eventually cease operations. In Alaska's North Slope, most oil fields peak within a few years from starting production and then decline fast; within 5 to 15 years, production is typically halved.¹⁰² The Prudhoe Bay field, for example, reached its peak in 1987; by 2018, its production was 86 percent lower. In other words, even a huge field discovered today could be quite small by 2050.

The production profile for gas projects is different: typically, gas fields sustain production for 15 to 20 years. Still, large-scale gas projects developed now might produce little gas in 2050. The Yamal LNG project, which came online in December 2017, could produce far less than half its output by 2050 (depending on new discoveries). The Alaska LNG project could come online by 2025, but by 2050, its production could be half its capacity without additional discoveries.¹⁰³

In a low-intensity scenario, there would be little additional investment relative to what has been committed to already. In Alaska, reduced oil production would eventually lead to the Trans-Alaskan Pipeline System (TAPS) shutting down, possibly well before 2050.¹⁰⁴ Gas from the North Slope will likely never be developed in this scenario. Even though LNG demand keeps growing, the higher cost of Alaskan gas would disadvantage it relative to other supply sources.

In Russia, oil production from offshore areas never takes off, and there is little oil production from the Russian Arctic in this scenario. Russian gas does a bit better: the LNG projects that are either online already (Yamal LNG) or under construction (Arctic 2) continue to operate, maybe at full capacity or maybe below if lower energy

prices reduce the incentive for additional exploration. With gas demand in the European Union almost halved by 2040, Russia's ability to keep exports high is curtailed as well, leading to an eventual decline in gas production for pipeline exports from the Yamal Peninsula.

MEDIUM-INTENSITY DEVELOPMENT SCENARIO

A medium-intensity scenario builds on the IEA's "Stated Policies" scenario.¹⁰⁵ Oil and gas consumption continue to grow through 2040.¹⁰⁶ In that world, projects in the Arctic experience neither a slowdown nor an acceleration. As the world moves toward harder-to-develop resources, it relies more on the Arctic, but there is no all-out push for development. This scenario imagines that projects currently on the horizon advance at some reasonable pace (some faster than others) and that new discoveries are made over time, enough to sustain this recent trajectory. We can imagine the following:

RUSSIAN PIPELINE GAS

The Yamal Peninsula will become a main gas producing region in Russia. For Gazprom, Yamal will offset declines in its legacy fields in West Siberia (in fact, the only way for Gazprom to sustain its gas exports to Europe through 2030 is by developing more fields in the Yamal Peninsula). Based on Gazprom's own numbers, the region should produce almost three times more gas in 2030 than it did in 2016. Anything less than that and Gazprom's exports to Europe could fall.¹⁰⁷

RUSSIAN LNG

The Yamal Peninsula will be the primary LNG exporting region for Russia. Led by Novatek, currently Russia's second-largest natural gas producer, a medium-intensity scenario would see Yamal become a major source of global LNG, below Qatar, the United States, and Australia in terms of volumes, but a significant region nonetheless. The region will likely export 37 million tons of LNG (in 2018 terms, this capacity would place Yamal third in the world behind Qatar and Australia). Given

some additional recent discoveries, that production level could be sustained and even enhanced into the 2040s. For example, Novatek's target is to produce 57-70 million tons of LNG by the late-2020s.¹⁰⁸

RUSSIAN OIL

The oil outlook in Russia's Arctic is harder to forecast because developments in this field are in an earlier phase and because the range of uncertainty is even greater. Gazprom Neft has three projects in the Arctic, two onshore and one offshore. Combined, they could reach a peak production of around 400 kb/d over the next few years. Otherwise, the company has little in the pipeline. Rosneft is even further behind. It has announced one discovery that could conceivably support a 100-150 kb/d peak production rate, but it is too soon to tell. In a medium-intensity scenario, one can imagine production between 500 kb/d and 1 mb/d, but this would depend on a continued stream of large (but not huge) projects coming online within a few years of each other.

ALASKAN OIL

The oil outlook for Alaska's North Slope has improved in recent years due to a series of new projects coming online as well as a few large discoveries. New projects are needed to stem the decline in oil production from existing fields. Production might rise over the next decade, perhaps reaching around 700 kb/d in the mid-2020s, which is a major increase relative to 2018 (472 kb/d) but still only back to its levels in 2007-2008 (in other words, still significantly below the peak production level in 1987). To sustain this production level, more discoveries would be needed. In this scenario, there is probably little to no oil developed from the Arctic National Wildlife Refuge (ANWR) or the Federal Offshore Lands in the Chukchi and Beaufort Seas.

ALASKAN GAS

In a medium-intensity scenario, Alaska's gas resources will likely be developed, probably through the \$43 billion Alaska LNG (AK LNG) project. To maintain its output through 2050, AK LNG will need to tap additional gas resources, which also means that new discoveries

do not necessarily mean a greater production potential for Alaskan gas, at least not absent a major new discovery. Alaskan officials have generally rejected the idea of building a liquefaction plant in the north, preferring instead to pipe the gas south to Cook Inlet. A warming climate could change that calculation.

HIGH-INTENSITY DEVELOPMENT SCENARIO

This scenario is modeled after the IEA's "Current Policies" Scenario.¹⁰⁹ In this world, there is no additional push toward low-carbon energy sources. Oil and gas consumption grow faster through 2040. The impacts of climate change are more widely felt in the world, which accelerates the warming and makes the Arctic more accessible as ice melts. In this world, the energy market needs the Arctic to balance supply and demand, and there is increased exploration that yields more discoveries and eventually more development.

In Russian pipeline gas, production is probably 50 to 100 percent higher, if all new fields were developed. In LNG, one can imagine a few more projects, perhaps not just by Novatek but also by Gazprom (say Shtokman) or Rosneft. Russia could close the gap with Qatar, the United States, and Australia and perhaps be a co-equal. Oil production would be higher, too. The numbers are merely speculative, but in Russia one could imagine production levels that exceed 1 mmb/d. In Alaska, production from the ANWR and the Federal Offshore Lands give a new lease on life to the state. Although it is hard to see oil production rebounding to its 1987 peak, output could plausibly double from today's levels and near 1 mmb/d, and perhaps more, suggesting output of 300-500 kb/d from these areas. This scenario has a larger energy market as well: oil production reaches 118 mb/d worldwide by 2040, so the Arctic supplying 2 to 3 mb/d results in an important but not dominant market position.

MARKETS VERSUS STATE SUPPORT

These scenarios are compatible with and might depend on different levels of government support. In theory, strong state support might accelerate development of the Arctic. It is possible to imagine state support playing a role when the markets have not encouraged Arctic energy development; governments may use state support to nudge investment in areas otherwise ignored by the market. A similar spectrum can be envisioned in a high-intensity environment: states might scale back support because the market signals are strong enough that no such support is needed. But states might also see the strategic value in an area that the world energy market needs and thus decide to extend more support. In short, one could conceptualize a matrix of outcomes involving high-, medium-, and low-intensity development, variably driven by market actors or state support.

The scenarios sketched above are largely driven by market economics rather than state support. These scenarios also do not necessarily factor in changes to current Western sanctions regimes. Of course, in both Russia and Alaska, the state supports development in remote areas, either through tax policy or infrastructure development. In Russia, frontier areas are subject to a different tax system, and the government provided widespread support for the Yamal LNG project, so much so that one analysis found the project would have been uneconomic otherwise.¹¹⁰ But state support exists in Alaska as well: credits for North Slope producers exceeded \$8 billion over the last 10 years.^{111,112} Alaska's approach to the AK LNG project, which cost more than \$40 billion, was similarly premised on heavy state support. For now, the state continues to prepare the ground for this project should the economics improve.

It is possible to envision more state support nudging the medium-intensity scenario toward our high-intensity projection. But there are limits. Within a healthy hydrocarbon industry, it is easy to allocate resources or forgo some revenues in order to develop more expensive areas. In the end, however, both Russia and Alaska are hydrocar-



Houses at the village of Sabetta in the Kara Sea shore line on the Yamal Peninsula in the Arctic circle, some 1,500 miles from Moscow. The Yamal LNG project aims to extract and liquefy gas from the Yuzhno-Tambeyskoye gas field and started production in 2017.

KIRILL KUDRYAVTSEV/AFP via Getty Images

bon dependent, needing their oil and gas sectors to return revenue. State support can aid development, but it cannot salvage a totally uneconomic sector. That approach would require subsidies from non-hydrocarbons, which neither has (although Alaska receives some of this support from the federal government). As the production center of these areas shifts north, the opportunity for cross subsidies declines.

CHINA'S ROLE

If one looks at where the Chinese are investing to source LNG, the Arctic does not look unusual. The China National Petroleum Corporation (CNPC) has contracted to purchase only a fraction of the LNG from the Yamal LNG project, and its equity share is in line with its participation in other projects.¹¹³ China's financial support for the proj-

ect is high, relatively speaking, but given how late it came, it likely signals a weakness in Yamal LNG rather than any strategic focus by China.

This note from Novatek's financial reports is also worth highlighting: "Production and reserves of the South-Tambeyskoye field developed by the Group's joint venture Yamal LNG is reported at 60% including an additional 9.9% interest not owned by the Group, since the Group assumes certain economic and operational risks related to this interest." This is the share held by the Silk Road Fund, which underlines that support for the project came with Novatek assuming "certain economic and operational risks" that are not present in its other transactions (with TOTAL and CNPC). Here too, one sees China well protected while Russia takes on risk.

Looking ahead, the IEA expects Chinese LNG imports at 200 bcm by 2040 and pipeline imports at a bit less.

If Chinese companies signed up for future projects as they did for Yamal LNG, then the Yamal Peninsula might supply something like 10 million tons of LNG (13.7 bcm). Assuming that some other LNG might reach China from other Arctic contracts, the volume may rise to 20 bcm or more. In that world, the Yamal Peninsula could account for 10 percent of China's LNG imports, which is not an insignificant amount but likely below the level of other suppliers (Australia exported 24 bcm to China in 2017).

At the same time, Gazprom wants to develop a western route into China, linking its resources on the Yamal Peninsula to the Chinese market. The Altai route, as this route is known, could supply 30 bcm per year to China. China has not been very keen on the project, but by 2050, it is possible to imagine a scenario with lower European gas demand and imports and Gazprom wanting to diversify its export routes. In that world, Arctic gas via pipeline could be a bigger supplier for China than LNG from the Arctic. The Arctic could supply more than 10 percent of China's total gas imports via both pipeline and LNG. Together with the eastern route (the Power of Siberia pipeline), plus other LNG from Sakhalin, it is possible to imagine a scenario where Russian supplies edge up to almost 20 percent of Chinese gas imports by some time in the 2030s or 2040s.

VALUE, STRATEGY, AND CONTEXT¹¹⁴

There is a significant investment boom in Alaska, one that gets far less attention but whose scale, in both barrels and dollars, is serious. From 2009 to 2018, companies invested \$27 billion in Alaska's North Slope while spending an additional \$28.6 billion to run existing operations. Alaska's Department of Revenue expects a similar level of spending over the next 10 years (\$54.4 billion total).¹¹⁵ It is easy to toss around a big number for Yamal LNG, specifically the often quoted \$27 billion in capital expenditures to bring about the project, but the analog for Alaska is not zero, even though it is lower than in Russia's Arctic.

In Russia, the Bovanenkovo cluster might produce 220 bcm by the late-2020s, but this production is needed merely for Gazprom to offset the decline in its legacy fields in West Siberia; it will not increase Gazprom's overall output. And to put the number in context, the Marcellus shale, which straddles Pennsylvania, West Virginia, Ohio, and New York, produced around 200 bcm in 2018, with this ramp up having occurred mostly in the last decade. Gazprom is going to the Arctic to sustain its production levels, while the United States has able to find additional gas (and oil) without having to exploit its harder to reach resources in the Arctic. That could help explain the different approaches to the Arctic.

In Novatek's grand strategy, Russia by 2030 becomes an LNG exporter on par with Qatar, the United States, and Australia, anchored by Novatek's business in the Arctic. This is clearly possible but presumes a stretch case for Russia while assuming a low-end outcome for the other three suppliers. The reality is that Qatar, the United States, and Australia will occupy a clearly high plain; their exports could be 75 to 130 percent higher than Russia's, at least based on the current slate of projects. Russia has upside to close that gap, but this is a stretch case that needs either new discoveries (in Yamal) or more progress in projects that have long been stalled (e.g., an expansion in Sakhalin).¹¹⁶

China's investment in the Arctic does not, until now, stand out relative to its other investments in LNG, nor is it clear that China has taken a strategic view of the Yamal LNG project. Its purchase contract and equity share in the project is akin to other shares. It extended finance but only at the last minute, and the Silk Road Fund acquired a stake, which, though unusual also occurred in the context of Novatek retaining some (unspecified) economic and operational risks. China's yards got a lot of work from Yamal, which might be linked to providing financing. Even so, there is a natural evolution in that relationship, and one can see the Yamal Peninsula become an ever-increasing source of gas for China, especially if Gazprom builds the Altai pipeline. Whether or not China sees Arctic gas in strategic terms, China may depend on the Arctic for a sizable share of its gas imports.

SCENARIOS FOR ARCTIC HYDROCARBON DEVELOPMENT TO 2050

	LOW-INTENSITY SCENARIO	MEDIUM-INTENSITY SCENARIO	HIGH-INTENSITY SCENARIO
SCENARIO ASSUMPTIONS	Transition to low-carbon energies, warming is “well below” 2o C versus pre-industrial levels. “Sustainable Development” scenario of the International Energy Agency (IEA). ¹¹⁷	“Stated Policies” scenario of the IEA. Oil and gas consumption continue to grow through 2050.	Higher demand for hydrocarbons, slow shift to low-carbon energy, more warming. “Current Policies” scenario of the IEA.
GLOBAL OIL, GAS, AND LNG PRODUCTION IN 2040 ¹¹⁸	OIL: 65.1 mb/d (vs. ~95.4 in 2018) GAS: 3,854 bcm (vs. 3,937 in 2018) LNG: 636 bcm (vs. 352 in 2018)	OIL: 103.5 mb/d GAS: 5,404 bcm LNG: 729 bcm	OIL: 117.7 mb/d GAS: 5,847 bcm LNG: 807 bcm
ALASKAN OIL	Few new fields are developed. Decline in existing fields eventually leads to the shutdown of the Trans-Alaskan Pipeline System (TAPS), possibly well before 2050.	All known discoveries are developed. ¹¹⁹ Production rises to ~700 kb/d in the 2020s, which is up versus 2018 but similar to 2007/2008 levels. More fields needed to maintain output and keep TAPS online. ¹²⁰	Medium-intensity scenario sustained by more discoveries, plus oil from the Federal Offshore Lands and the Arctic National Wildlife Refuge (ANWR). ^{121, 122} Output could reach 500 kb/d to 1 mb/d (with lot of caveats). ¹²³
ALASKAN GAS	North Slope gas is not developed.	A large-scale LNG project is developed (similar to the Alaska LNG project), but output in 2050 is below nameplate capacity due to insufficient resources. ¹²⁴	A large-scale LNG project is developed, additional resources sustain production, and exports even rise slightly based on new discoveries.
RUSSIAN OIL	Existing fields go into decline; there is very little production from the Arctic. ¹²⁵	Russian oil production increased—but within a band of 500 kb/d to 1 mb/d (driven by fields of similar size to those developed to date).	Oil production could exceed 1 mb/d, largely driven by the large offshore acreage that Rosneft holds (and where activity has slowed due to sanctions). ¹²⁶
RUSSIAN PIPELINE GAS	European gas demand is almost halved by 2040, shrinking the main market for Russian pipeline gas. ¹²⁷	Gazprom reaches its target to produce 220 bcm from the “Yamal megaproject” cluster, but this mostly offsets declines in West Siberian fields currently online. ¹²⁸	Yamal megaproject reaches Gazprom’s aspirational 360 bcm (and perhaps even includes Shtokman via pipeline or LNG). ¹²⁹
RUSSIAN LNG	Yamal (online) and Arctic 2 (under construction) account for 37 million tons of LNG per annum (mmtpa); output is below capacity due to resource maturity.	NOVATEK builds an additional one or two projects (its target for 2025-2030 is 57 to 70 mmtpa). ¹³⁰	Novatek keeps growing, and even languished projects (like Shtokman) come online. Output could keep rising to 90-100 mmtpa.

Mapping America's Return to the Arctic

How to Restore U.S. Presence and Leadership to a Strategic Region

The year 2019 will be marked as the year that the U.S. national security community rhetorically acknowledged the strategic importance of the Arctic. A decade ago, one of America's near-peer military competitors, Russia, had already made that realization. The Arctic's vast resources and emerging maritime passageways became the collective impetus for significant changes to Russia's military and economic posture. Five years ago, America's other near-peer military competitor, China, also recognized the Arctic as a strategic imperative and made important adjustments to its economic and scientific posture. And while the United States may recognize the Arctic's strategic importance, Washington is still largely pursuing the same policies and funding allocations as it was in 2009. This passive approach is no longer sustainable; a more proactive strategy is required to secure U.S. national interests in the Arctic.

form of a heavy polar security cutter, a deep-water port, a scientific observation center, a sustainable economic investment, or a significant investment in a diplomatic outcome in a multilateral negotiation format. In other words, presence can manifest itself in the form of physical infrastructure or in the form of ideational leadership. To enhance American influence in the Arctic, the United States must enhance all forms of its presence in the Arctic. This must be done with urgency in order to recover from a "lost decade" of policy stagnation in the Arctic. A renewed presence will require a reorganization of the U.S. government related to Arctic issues, a significant increase in U.S. Arctic diplomatic presence and activity, the development and positioning of increased U.S. security and infrastructure assets, the strengthening of in situ science and research, and the promotion of economic opportunities across the circumpolar Arctic.

THE ARCTIC EQUATION: PRESENCE EQUALS INFLUENCE

The U.S. Coast Guard frequently notes that, in the Arctic, presence equals influence. Presence can take the

Organizing for Success

For the United States to demonstrate—clearly, consistently, and with urgency—that the Arctic is strategically important to its interests, it must organize itself for long-term success. The United States has always struggled with its intergovernmental coor-

dination activities related to the Arctic.¹³¹ Various formulas have been tried, such as a U.S. special representative to the Arctic region and a White House Arctic Executive Steering Committee, but they have not had an enduring impact. We recommend that the U.S. government establish or alter several senior positions across the national security community, to include:

- Creating a senior director for the Arctic at the National Security Council;
- Renaming the assistant secretary of state for the Bureau of European and Eurasian Affairs to the Bureau of European, Eurasian, and Arctic Affairs;
- Establishing a deputy assistant secretary of defense for Northern European and Arctic Affairs in the Office of the Secretary of Defense; and
- Creating a senior civilian leader position in the Department of Homeland Security that is tasked with focusing on protecting America's Arctic.

Similarly, the United States must update its current Unified Command Plan (UCP) for the Arctic region. The current UCP for the Arctic has overlapping combatant command responsibilities and different perceptions of threat (if there are perceptions at all) as it relates to the Arctic area of responsibility. As a result, each develops different strategies generating different requirements to counter their perceived threat. Consideration should be given to creating a separate, sub-regional command under the direction of USNORTHCOM for the purpose of protecting the homeland and its two avenues of approach from the North Pacific and North Atlantic. The defined area of responsibility (AOR) would include the circumpolar Arctic, unifying both the North Pacific and North Atlantic under one operational AOR. This sub-regional command would integrate expertise from USNORTHCOM, USINDO-PACOM, and USEUCOM, and introduce the capabilities of USSOCOM.

Greater American presence in the Arctic will increase American influence in shaping the future

of the Arctic and ensure continued U.S. access to the region. America's physical presence in the Arctic must be multifaceted and dynamic, leveraging America's strengths, which include its extensive network of partnerships across the public and private sectors. Specifically, we recommend developing two main American "pillars of presence." The first pillar revolves around increased diplomatic and security presence, and the second mutually reinforcing pillar supports a greater scientific and economic presence.

PILLAR 1: INCREASING U.S. DIPLOMATIC AND SECURITY PRESENCE IN THE ARCTIC

1. *Increase U.S. Arctic Diplomatic Presence:* The United States should bolster its diplomatic presence by increasing the number of U.S. consulates and American diplomatic posts (or American corners) in fellow Arctic Council and other truly near-Arctic states (as opposed to China). This includes Canada, Denmark, Norway, Sweden, Finland, Iceland, and the United Kingdom. This also includes a more robust diplomatic outreach to Russia within the framework of the Arctic Council and coastal states. With a more robust diplomatic presence, the United States should:
 - a. Initiate annual meetings of the foreign and defense ministers of the eight Arctic Council nations, outside of the Arctic Council venue;
 - b. Promote more frequent meetings of the five Arctic coastal states to discuss management of the Central Arctic Ocean (CAO); and
 - c. Facilitate the organization of informal Arctic coalitions within major international organizations and multilateral fora to highlight Arctic initiatives.
2. *Create a Multiyear Arctic Security Initiative (ASI):* From a security and defense perspective, the United States must budget the necessary resources to enhance its presence in both the North American

and European Arctic. Just as the United States has responded to Russia's military posture in Eastern Europe through a series of bilateral defense enhancements funded in part by the European Deterrence Initiative (EDI), the United States should create an Arctic Security Initiative, or ASI.

- a. The ASI would fund Arctic public-private infrastructure projects to further domain awareness and safety. Projects might include a deep-water port in the American Arctic, additional Coast Guard forward-operating locations in Alaska, refurbished hangars for air assets, and improved telecommunications systems.
- b. The ASI could fund greater exercises and training in the Arctic, to include search-and-rescue, oil spill response and cleanup, and protection against IUU fishing, all while utilizing the North Pacific, North Atlantic, and Arctic Coast Guard forums.
- c. The ASI would fund additional polar security cutters and ice-strengthened surface vessels, reinforce existing reception facilities along Greenland's west coast, and develop limited reception facilities and sensor capabilities along Greenland's east coast to enhance anti-submarine warfare (ASW) capabilities in the GIUK gap.
- d. The ASI could support enhanced satellite communications, unmanned undersea vehicles, additional Arctic sea floor mapping, improved weather and ice floe monitoring, and a comprehensive automatic identification system to monitor increased vessel traffic, with a particular focus on LNG carriers traversing the narrow Bering Strait.
- e. Funds could also be used for a layered homeland defense design, the increased deployment of strategic forces with short-duration rotational deployment of bombers, and investment in upgraded sensors for indications and warnings.
- f. Funds could be directed toward enhancements to Thule Air Force Base, such as upgrades to the early warning missile defense radar in Greenland, as well as the eventual modernization of NORAD's air, radar, and satellite systems,

as part of enhanced Arctic air and maritime awareness and preparedness.

- g. Funds could also be used to address infrastructure damage caused by climate impacts, such as permafrost thaw and coastal erosion.

PILLAR 2: STRENGTHENING SCIENCE, RESEARCH, AND SUSTAINABLE ECONOMIC OPPORTUNITIES

1. *Create an Arctic Science and Sustainable Economic Fund:* The United States must leverage its strength in Arctic science. This includes the robust and world-renowned U.S. scientific network of institutions and scholars. The budget specifically for Arctic science and research should increase, particularly as it relates to the physical location of observational research infrastructure and expanded research campaigns across the circumpolar Arctic. Crucial to these efforts is the inclusion of indigenous voices, whose knowledge and experience in the region are invaluable. Along the lines of the ASI, the United States should create an Arctic Science and Sustainable Economic Fund (ASSEF) to accomplish a number of goals.
 - a. Increase the number of U.S. research stations based in the Arctic. Currently, the United States has only three research stations: two in Alaska, Toolik and Barrow [Utqiagvik], and one in Greenland. Only two are operational year-round.
 - b. Facilitate public-private partnerships with the fishing, tourism, and shipping industries to increase observational coverage and improve domain awareness in close coordination and cooperation with indigenous communities;
 - c. Support resiliency in indigenous communities and support coastal village relocation, as well as water, sanitation, affordable energy, and mental health needs.

- d. The ASSEF would also support the development of sub-regional trade and investment activities for both the North Atlantic Arctic region (including New England, Canada’s maritime provinces, Iceland, Denmark, and the United Kingdom) and the North Pacific region (including Alaska and Canada’s Northwest Territories).
2. *Support International Norms and Agreements:* Internationally, the United States should lead in promoting new and supporting established international norms and agreements in science and sustainable practices. This includes:
 - a. Enhancing U.S. scientific engagement and funding in the biodiversity of the CAO, with particular focus on the 5+5 fisheries moratorium’s “Joint Program of Scientific Monitoring” to further study the CAO’s ecosystem and activities related to enhancing biodiversity beyond national jurisdiction (BBNJ).
 - b. Utilizing the Agreement on Enhancing International Arctic Scientific Cooperation to establish other norms and regulations that are grounded in science and preemptively protect the region. Doing so would establish transparency and norms related to scientific collection, data monitoring, and analysis. It would facilitate access to key research, particularly in the Russian Arctic.

ton adjusts its posture, it will continue to have limited abilities to address Russia and China’s growing Arctic presence and capabilities.

CONCLUSION

A reorganized U.S. government that prioritizes the Arctic and oversees a two-pillared approach underwritten by multiyear funding will take demonstratable steps to increase America’s diplomatic, security, scientific, and economic presence in the Arctic. These are critical steps to restore U.S. leadership and influence in an increasingly strategic and vulnerable region. With these efforts, the United States will be better positioned to protect and promote its national interests in the Arctic while ensuring that future Russian and Chinese strategies in the Arctic adjust to the return of American influence to the region. Unfortunately, until Washing-

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would amount to almost 1 billion barrels—which is comparable to the Pikka (onshore) discovery made by Repsol in Alaska (1.2 billion barrels recoverable tight oil; with a possible production plateau of 120 kb/d). Even so, there is no mention of Pobeda in the 2015, 2016, 2017, or 2018 annual reports.

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