

PUTIN'S UKRAINE INVASION

Turbocharging Sino-Russian Collaboration in Energy, Maritime Security, and Beyond?

Andrew S. Erickson and Gabriel B. Collins

Putin's war of choice in Ukraine goes far beyond Javelins, the High Mobility Artillery Rocket System (i.e., HIMARS), and Russia's campaign of destruction against the second-most-industrialized post-Soviet state. Shock waves from the war now wash across the shores of maritime Asia, with years of unfolding impacts ahead. Accordingly, this article takes readers through a journey featuring ecosystems inhabited by oil barrels, gas pipelines, submarine technologies, jet engines, and basing access. It also will explore China and Russia's centuries-old relationship cycle of fear, temporary bonds of common cause, and division anew.

In coming months and years, China will tap the Russian raw material storehouse more deeply. But a Moscow under duress and isolation could yield far more than cheaper oil and gas; Russian military pinnacle technologies—particularly in the undersea-warfare realm—could be coupled with China's financial

resources and industry to tip the Indo-Pacific security balance in favor of a Sino-Russian axis of autocracy at the expense of the United States and its allies and partners. People's Liberation Army (PLA) access to air and naval bases in the Russian Far East and High North, plus acoustic intelligence sharing, could make conditions in the Indo-Pacific even worse for the United States and its allies and partners.

Yet downside risk for the United States is not the only story unfolding. This article also assesses potential limiting factors that could constrain,

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divert, or even derail Sino-Russian interaction. Long-standing mutual suspicions have dogged the two countries' relationship, arguably since the 1689 Treaty of Nerchinsk. The treaty was the first-ever such agreement between the tsardom of Russia and the Qing dynasty of China, and defined their initial mutual border and market access.¹ Exigencies of the day dominate the present discourse on Russo-Chinese relations, but the ongoing Russo-Ukrainian war does not eliminate concerns among Russia's current decision makers, or its populace, regarding China's long-term ambitions—nor does it fundamentally change the reality that a weakened Russia could arouse revisionist ambitions in China.

A Russia whose motives for aggressive military action in Europe likely include regaining the fear-based “respect” accorded the Soviet Union in the past may tire of being viewed—and perhaps treated—as a vassal of China. Indeed, scholars Fiona Hill and Angela Stent assess that Putin “wants the West and the global South to accept Russia's predominant regional role in Eurasia. This is more than a sphere of influence; it is a sphere of control, with a mixture of outright territorial reintegration of some places and dominance in the security, political, and economic spheres of others.”² Such a vision is likely to generate friction points rapidly with China (the self-styled leader of the aforementioned “global South”) as it deepens its already large economic presence in Central Asia. Moreover, in the probable event that Putin increasingly accommodates People's Republic of China (PRC) demands in an attempt to shore up Russia's economic situation, Russian popular resentment at national subservience may prompt Putin or his ultimate successor to reset relations symbolically, and even substantively, away from Beijing's preferences. In any event, the equations likely to govern ongoing geoeconomic and geopolitical shifts are dynamic and multivariate. That being the case, this article aims to illustrate potential boundaries, identify important shaping forces, and thus create a template for understanding both ongoing processes and evolutions yet to come.

The extreme complexity of the Sino-Russian relationship—both for the parties involved and regarding their combined impact—must be factored into projections of possible trends and outcomes. A key contradiction and friction point lies in the fact that China already regards Russia as being on an unstoppable decline to permanent marginalization, as measured by key economic and demographic metrics; yet Russia's historical and cultural identity resists accepting a position as China's resource pool or subaltern. Simultaneously, however, there is a complex codependency; rather than merely using it as a vassal, Beijing needs Moscow as an independent partner—one globally regarded as such—that exemplifies the benefits that a China-led order provides for PRC partners and that is strong enough to hold up in the face of challenges and resistance from the United States, European Union (EU), and other entities, including in the Middle East. If, for

example, PRC president Xi Jinping views events unfolding in Ukraine as the opening salvo in a broad East-versus-West confrontation for control of the international system, in keeping with his signature assessment that “the world is undergoing profound changes unseen in a century, but time and situation are in our favor,” and that the changes will shift the international system away from Western dominance, then Sino-Russian collaboration could deepen significantly.³

With such transformative possibilities in mind, this article will ground its assessments in the best available empirical data and be transparent in its assumptions and logic, but it will not shy away from examining what may well be low-probability yet high-impact possibilities. After all, few government organizations or analysts anywhere appear to have anticipated fully the scope and pace of PLA development over the last two to three decades, yet this development has enabled the dramatic overturning of cross-strait military equations and threatens to become the central security issue of this decade.

A CRITICAL INFLECTION POINT?

Depending on how the aforementioned factors interact, the United States and its allies and partners may face the prospect of a China that is simultaneously somewhat less reliant on seaborne oil and gas imports and far more able to project power regionally and globally through an enhanced nuclear-powered submarine force. On a five-to-ten-year time frame, as Europe potentially becomes more dependent on seaborne liquefied natural gas (LNG) imports for its gas supplies, the People’s Liberation Army Navy (PLAN) even might develop capacity to hold maritime energy commerce of the United States and its allies at risk—thereby outflanking the maritime energy blockade concept that formerly was seen as an asymmetric, unilateral, American advantage in a conflict with the PRC.⁴

Russia’s invasion of Ukraine—the first attempt by an industrialized nation-state to conquer another by force in many decades—is transforming national-security outlooks tectonically and altering a range of international relationships. The metamorphic process is unfolding rapidly—and to Russia’s dramatic detriment in its relations with the NATO / Organisation for Economic Co-operation and Development (OECD) countries. Collectively, this bloc still accounts for about 45 percent of global gross domestic product, as measured in terms of purchasing power parity (the metric most favorable to the PRC, Russia, and other nondollar, non-euro economic zones), and controls key intellectual property behind many apex civilian and military technologies.⁵

If the OECD countries can reduce exposure to markets influenced by Russia over time, this might seem to improve their net security position. The outstanding example would be energy commodities; reducing imports of natural gas and crude oil / refined products from Russia appears to be evolving into a multiyear

campaign.⁶ However, such reduction of exposure does not occur in isolation. Russian entities are not passive actors in the face of external pressure. Indeed, over the past decade they have shown remarkable creativity and resilience in their adaptations to Western sanctions imposed in the wake of the Kremlin's February–March 2014 invasion of Ukraine, which initiated the Russia-Ukrainian war that persists to the present.⁷ Moreover, commodity markets abhor a vacuum. Economically discounted resource supplies soon attract the interest of opportunistic parties—a process occurring already in oil markets as buyers quietly flock to Russian Urals-grade crude oil that sells for a discount of thirty dollars per barrel relative to global benchmarks. China's world-leading appetite for raw materials makes it an integral player in these developments.

As (or if) European importers wean themselves from Russian-origin commodities such as crude oil, refined products, and natural gas, then the loss of market share conceivably might keep some portion of molecules in the ground and unproduced. But the more likely outcome is that—as has happened multiple times in human industrial history—commodity-flow patterns will realign and adapt to new geopolitical realities. This article accordingly will assess the propelling factors and potential limitations that could govern key commodity markets' future evolutions in the postinvasion Sino-Russian relationship.

These circumstances affect the nature of the Sino-Russian relationship fundamentally. Russia's vulnerability makes it more reliant on China for economic, political, and perhaps even military support. To the extent that Beijing helps Moscow in this time of need, it almost certainly will expect something in return. China will demand benefits (*quid pro quos*) for the political and economic harm that will come from supporting Russia, which is now a pariah state to Group of Seven (G7), European, and Western countries (although not to India, nor much of the developing world). Key questions include, therefore, what China might attempt to “buy” with this goodwill and how China might seek to leverage its growing influence over Russia in ways that harm U.S. interests, especially in the maritime realm.

Potential for apex military technology transfer bears particularly close consideration. While China already has purchased, acquired illicitly, or developed indigenously *most* of what Russia has in terms of military technologies, open sources have not confirmed yet PRC mastery of several apex technologies with which Russia long has demonstrated cutting-edge capabilities. In perhaps the greatest single example, Russian nuclear-powered submarines have retained a tremendous edge over Chinese ones, which long have been excessively noisy, particularly owing to the heretofore primitive nature of their nuclear-propulsion plants, which are derived from a generations-old Soviet nuclear icebreaker design.⁸ With Beijing's leverage rapidly increasing, Moscow's ultimate military

pièces de résistance finally may be within its reach and doubtless will attract concerted PRC attention. Could the United States and its allies soon face some form of multifarious Russo-Chinese security alignment with bilateral echoes of the trilateral security pact among Australia, the United Kingdom, and the United States (AUKUS)?⁹

RUSSIA'S ISOLATION MAY GIVE THE IMPRESSION OF A "SUPERSIZED IRAN"

Russia's invasion of Ukraine both has been far less successful overall and has elicited far more negative, concerted, international countermeasures than Putin and his advisers likely expected. Russia increasingly is isolated politically, its civilian economy faces growing disconnection from much of the outside world, and its military now is embroiled in a costly, protracted conflict that already has produced casualties and equipment losses on a scale that Russia has not experienced since 1945. Armed hostilities potentially could persist for years. Indeed, in September 2022 Russia commenced its first large-scale military mobilization since World War II. The effort officially aims to raise three hundred thousand soldiers, but unconfirmed reports suggest it actually may have a target of more than one million men.¹⁰ Congruently with his attempts to expand Russia's military manpower base, Putin also is endeavoring to mobilize Russia's defense-industrial sector more fully.¹¹

As the ongoing war intensifies the isolation that began after Putin's first invasion of Ukraine in 2014, Russia is sliding toward becoming what Alexander Gabuev memorably calls "a giant Eurasian Iran."¹² The metaphor aptly illustrates one set of impacts on the Sino-Russian relationship: China's opportunity to obtain discount-priced hydrocarbons and other raw materials from a counterparty that has made itself a pariah across much of the industrialized world.

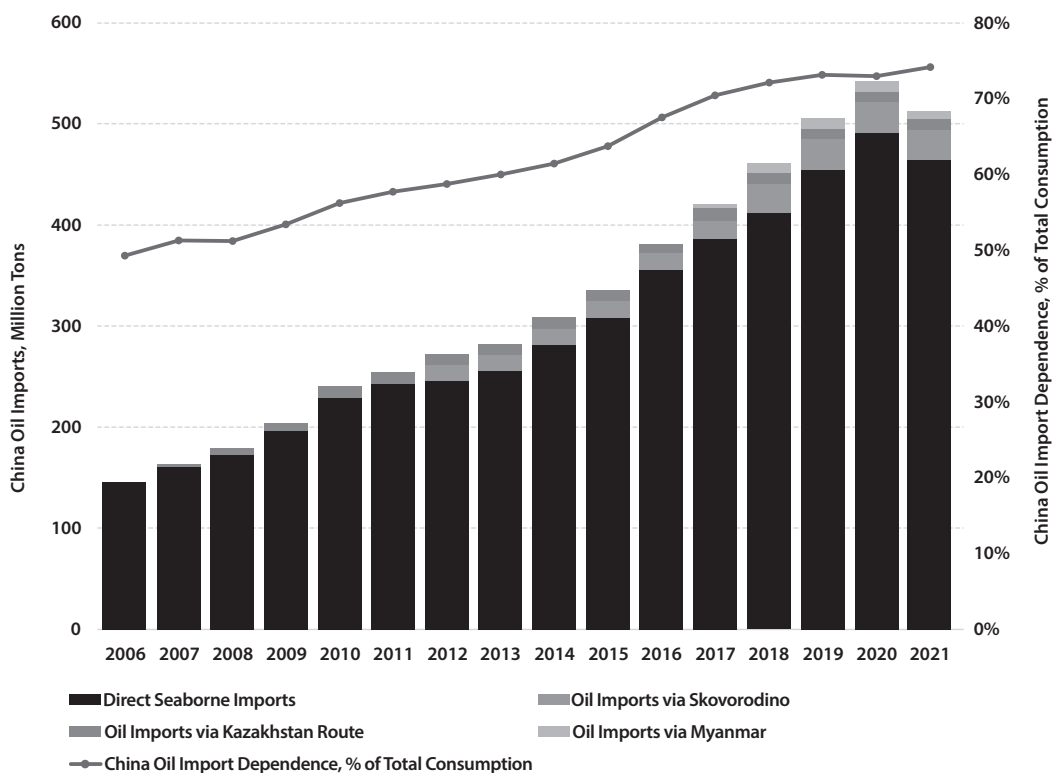
And There Are Some Limited Echoes on the Energy Front

The planned European embargo on Russian oil supplies is a strong diplomatic signaling move, but it fundamentally does not alter the reality that Russia still accounts for nearly 10 percent of global oil production—a vital position surpassed only by Saudi Arabia and the United States.¹³ Assets specifically oriented to transport Russian oil to customers in Europe, such as the ironically named Druzhba (Friendship) pipeline, likely will be underused significantly if the embargo enters into force as planned at the end of 2022. In the Druzhba's case, the line can carry approximately 1.3 million barrels per day (bpd) of crude oil, but the EU markets exempted from an embargo against Russian oil supplies (those of the Czech Republic, Hungary, and Slovakia) have a combined daily oil demand of only about 460,000 bpd, which, in theory, would leave the line running at only 35 percent capacity.¹⁴

Yet most of Russia's oil reaches global markets, including Europe, by seaborne tankers that readily can be diverted to new customers, whether in China, India, or elsewhere. Indeed, although certain Chinese constituencies favor expanding overland oil supplies, over the past fifteen years the country increasingly has turned to seaborne imports—even for oil obtained from Russia and Kazakhstan, with which China has direct pipeline links (see exhibit 1).¹⁵

Natural gas is different, because Europe obtains most of its Russian-origin supplies through trunk pipelines that total at least sixteen thousand kilometers (km) in length built over the last five decades. The primary Russian pipeline corridor to Europe—via Ukraine, Belarus, and Nord Stream 1—collectively can transport 235 billion cubic meters (bcm) of gas per year, but in 2021 it only moved 167 bcm, as Gazprom withheld supplies to destabilize Europe ahead of Russia's second invasion of Ukraine in February 2022.¹⁶ Volumes will be far lower in 2022. Gazprom has shut down the Yamal Pipeline through Poland, and in September 2022, saboteurs destroyed the Nord Stream 1 and 2 pipelines under the Baltic Sea, leaving it unclear when—or even if—the lines could resume service (or in Nord Stream 2's case, begin service at all).¹⁷

EXHIBIT 1
CHINA SEABORNE VS. OVERLAND OIL IMPORTS, 2006–21 (MILLION METRIC TONS)



Source: China General Administration of Customs, english.customs.gov.cn.

The pipeline-centric past and present of Europe's gas-supply architecture, together with the likelihood of a future more centered on seaborne LNG, create two consequential asymmetries. In the first asymmetry, Russian pipeline gas accounts for about one-third of Europe's total gas supplies and nearly 8 percent of Europe's total primary energy supply, but less than 7 percent of Russia's federal budget revenues. This creates strong near-term incentives for the Kremlin to weaponize gas flows, given the disproportionate and immediate impact on European energy security and the continent's industrial, economic, and political bases. European decision makers—Germany's in particular—failed to address sufficiently this clear potential for coercion despite repeated warnings, and now they are left scrambling for supplies in a gas crunch that potentially could persist for several years.¹⁸

The second, future-oriented asymmetry leans more in Europe's favor. The harms and breach of trust wrought by Russia's unprecedented weaponization of gas against prime customers in Western Europe increasingly are prompting major consumers, including Germany, to pursue a "gas geoeconomics" diversification policy.¹⁹ LNG constitutes a major prong of this approach, as it credibly could displace much, if not most, of Russian gas supplies into Europe.²⁰

An expansion of LNG import capacity that allowed a 25 bcm/year residual volume of Russian pipeline gas supplies would require Europe to add on the order of 165 bcm/year of additional LNG regasification facilities—the equivalent of roughly twenty-five floating storage and regasification vessels.²¹ The vessels require roughly two and a half years to build and would cost approximately \$350 million apiece, with an additional \$150 million in infrastructure costs to integrate them into shore-based pipeline systems.²² A summation of the above infrastructure totals an estimated \$12.5 billion in capital-investment needs. We conservatively increase that total by half again to account for unforeseen additional infrastructure needs, yielding an overall investment sum just shy of \$20 billion. That is the prospective "breakup fee" for Europe to end its pipeline gas relationship with Russia.²³

What, then, of that "now homeless" 165 bcm/year of Russian gas supplies? Putin's objective prior to the 2022 invasion likely was to create a Eurasia-spanning gas web that eventually would allow it to maximize pricing power in Europe by simultaneously underpricing most seaborne LNG to protect its market position in Europe, while also hanging the prospect of greater exports to China as a sword of Damocles over European consumers during price negotiations.²⁴ Now the issue likely is to become not one of commercial arbitrage but instead one of a semidesperate position that entails one of the following: (1) facing the prospect of shutting production in, and potentially damaging, fields; (2) expanding LNG export capacity significantly; or (3) constructing a pipeline infrastructure between Russia and China that replicates the one linking Russia to Europe now. Both the

second and third approaches may prove tremendously challenging and costly to Russia relative to the status quo ante.

While Novatek now operates two world-scale projects in the Russian Arctic (Yamal LNG and Arctic LNG 2), Russia would need to expand its northern Siberian LNG capacity four- to fivefold to absorb the gas that would become available if Europe successfully backs out of Russian pipeline supplies from that region over time.²⁵ However, this is unlikely for several reasons. First, building the facilities would take years—potentially a decade. Second, LNG facilities are more complicated to construct and operate than pipelines, and key firms with the requisite technology and expertise likely would be deterred by sanctions exposure under the U.S. Countering America's Adversaries through Sanctions Act (CAATSA), which could be amended to include Russian LNG facilities if the Kremlin were to embark on a major expansion. Third, if Russian entities used stolen intellectual property (IP) to build LNG trains, cargoes exported from those facilities potentially could be seized at non-Russian ports to settle claims brought by the IP owner.²⁶

Accordingly, the baseline scenario would involve Russia seeking to export gas to China by pipeline. Multiple tactical and strategic factors thus likely would guide Chinese counterparties as they contemplated pipeline imports from Russia. On a tactical level, PRC parastatals could be reluctant to finance the pipelines Russia would need to redirect Siberian gas supplies to China. Doing so could expose them to sanctions under CAATSA, which includes provisions to sanction entities that support construction of Russian energy-export pipelines.²⁷ Western and OECD entities clearly would not finance China-bound pipelines, and PRC entities likely will refrain from doing so on the basis of concerns about CAATSA risk. This leaves Russia in a position in which it would have to self-finance gas pipelines that could cost \$4.0 million per kilometer (see exhibit 2).²⁸

Assuming a need for four additional 35 bcm/year gas pipelines to China that average 4,000 km apiece in length, this would imply a total additional financial commitment of at least \$65 billion. Notably, Gazprom bore the cost of its initial pipeline to China (the Power of Siberia project, which came on line in late 2019), along with the supporting fields and infrastructure. Whether it can do so again under a sanctions regime far more onerous than the one that existed during the period of 2014–21 remains uncertain. What is clear is that Russia's isolation from most international finance options means that each ruble spent on redirecting gas from Europe to Asia would be one fewer ruble available to support warfare or rebuild depleted military combat power.

There are ways that China could finance additional Siberian pipeline projects. Its commercial and development banks can marshal enormous resources, and PRC financiers could create a special-purpose entity that is protectively “sandboxed” away from the reach of U.S. sanctions. Chinese actors took such an

EXHIBIT 2 EURASIAN GAS PIPELINE COSTS

Name	Countries	Commodity	Capacity (bcm) / Year	Length (km)	Cost (million USD) (raw)	Cost (million USD) / km
Power of Siberia 1	Russia, China	natural gas	38	3,968	15,912	4.0
West–East Pipeline II	China	natural gas	30	8,819	20,000	2.3
West–East Pipeline III	China	natural gas	30	6,840	20,000	2.9
Central Asia–China Gas Pipeline C	Turkmenistan, Uzbekistan, Kazakhstan, China	natural gas	25	1,833	7,000	3.8
West–East Pipeline I	China	natural gas	17	4,000	5,700	1.4
Central Asia–China Gas Pipeline A	Turkmenistan, Uzbekistan, Kazakhstan, China	natural gas	15	1,833	7,300	4.0
Central Asia–China Gas Pipeline B	Turkmenistan, Uzbekistan, Kazakhstan, China	natural gas	15	1,833	7,000	3.8
Myanmar–China Gas Pipeline	Myanmar, China	natural gas	12	770	1,040	1.4

Sources: Global Energy Monitor, www.globalenergymonitor.org; “Yearly Average Currency Exchange Rates”; PetroChina, www.petrochina.com.cn; South China Morning Post, www.scmp.com.

approach with respect to Iran sanctions by making Kunlun Bank the designated transactor with Iranian entities.²⁹ A PRC consortium backing the pipelines even could be seeded by selling U.S. Treasury holdings—a point worth considering, given that between January and June 2022 the PRC sold down more than \$90 billion of its Treasury portfolio.³⁰ Oil-trading ventures tap into a range of services intersecting with the dollar economy that expose them to sanctions (and, perhaps as importantly, expose their counterparties to secondary sanctions). This reality makes the bigger actors, even from the PRC, hesitant to flout U.S. sanctions. However, a continental gas network between Russia and China whose PRC side was housed in a special corporate vehicle segregated from the U.S. financial system, that did not need insurance from London, that used domestic steel and compressor turbines, and that priced the delivered gas in Chinese yuan would be highly sanctions resistant.³¹ All the above notwithstanding, just because Beijing *could* find a way to finance the lines does not mean it *will* do so—at least not on the accelerated time frame that Moscow probably would seek. Rather, Beijing is likely to allow distress to build, play for decision-making time, assess the evolving situation, and maximize its commercial leverage and policy options in the process.

China needs more gas and will have to import a substantial portion of it, but Russia is not its only supply option. On the strategic level, PRC decision makers

thus will weigh the pros and cons of seaborne LNG versus pipeline gas from Russia. They will make this consideration because domestic resources and gas from Central Asia (China's other pipeline gas source) appear unable to expand fast enough to meet rising demand.³² Central Asian producers, especially Turkmenistan, have large reserves, but "aboveground" issues could impede full development of their resources. This leaves LNG imports—a source that potentially would be vulnerable to maritime interdiction during a major crisis or outright war, but otherwise would allow Chinese buyers to access gas from dozens of supply points worldwide and avoid coercion by any single supplier. Russian gas, in contrast, comes via physically secure pipeline routes, but it is a single-point source coming from a country that now actively is weaponizing gas against large European customers such as Germany, with which it previously had a stable, four-decade-plus commercial relationship. Such actions likely will give PRC decision makers pause.

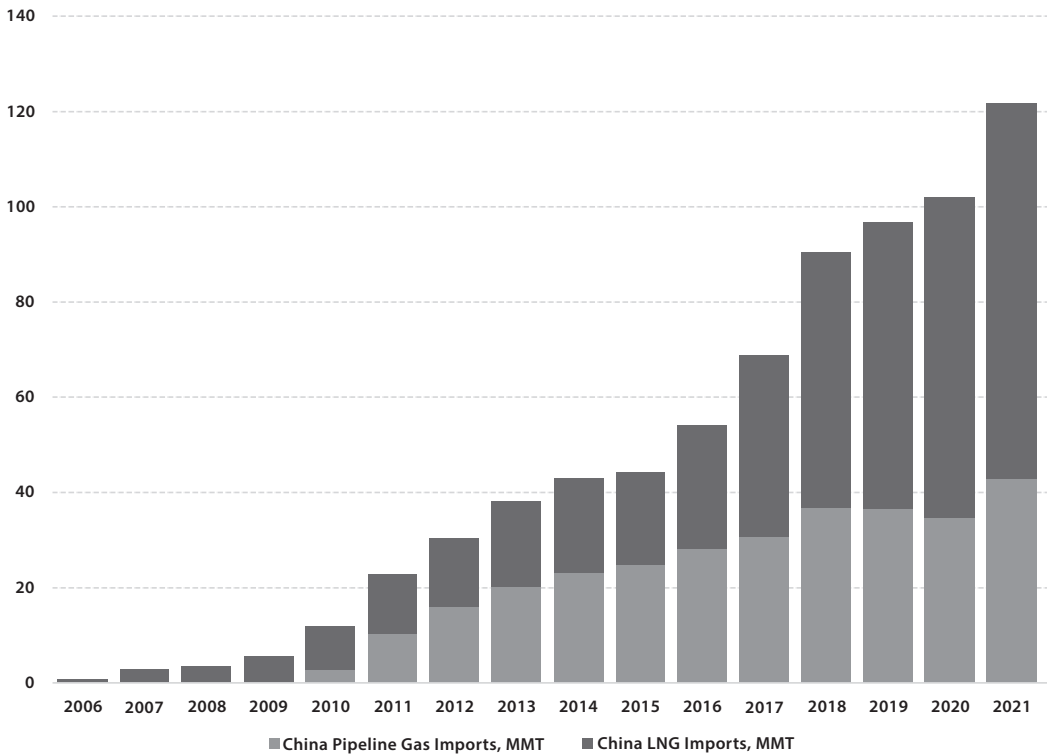
Ultimately, China is expected to expand both its LNG import capacity and pipelines from Russia (funded by Gazprom) to give China options for gas sourcing at favorable, depressed prices while also minimizing the perceived interdiction risk associated with seaborne imports.³³ Accordingly, China opportunistically will capitalize on Russia's isolation and European attempts to push Russian gas out of the continent's gas markets, but in a way that emphasizes supply diversity and hedges against Russia's demonstrated potential for weaponizing energy exports.³⁴ The past decade of China's gas-import sourcing reflects precisely such an approach of balancing overland pipelines from multiple regions against seaborne LNG (see exhibit 3).

PRC planners likely are to continue favoring a portfolio approach to oil and gas sourcing, rather than casting their lot entirely with either overland or seaborne imports. Strategically, pipelines are a two-way street; the seller becomes dependent on the buyer, but—given the sunk infrastructure costs—so too does the buyer on the seller. This is a linkage that China may prefer to mitigate by investing in LNG terminals as opposed to focusing overwhelmingly on pipelines.³⁵ Militarily, pipelines would be an extremely concentrated fixed target set in the event of great-power conflict. The majority of additional Russian oil and gas exports to China thus will come by sea—the approach affording Beijing the greatest flexibility and resilience. Their protection will be a growing—and highly challenging—mission for the PLAN.³⁶

*But from an Indo-Pacific Strategic Interest Standpoint,
Military Technology Is the Critical Area . . .*

China probably sees some elements of its Iran relationship reflected in its evolving ties with Russia—namely, the opportunity to nibble around the edges of sanctions to obtain energy commodities at far lower prices than would be possible

EXHIBIT 3
CHINA NATURAL GAS IMPORTS, 2006–21 (MILLION METRIC TONS)



Source: China General Administration of Customs, english.customs.gov.cn.

otherwise. But there is a whole other dimension in the present case that is entirely absent from China's relationship with Iran: Russian defense firms' financial duress could induce them to sell flagship technologies, the transfer of which would have been inconceivable just twelve months prior. The systems China covets are not affected critically by Russia's poor military performance in Ukraine. For armaments that may be somewhat tarnished (e.g., some surface-to-air missiles [SAMs]), PLA planners are (1) learning from Russian mistakes and (2) assuming that Russia has good weapons capital and poor human capital, while China will be sure to develop *both*.

Russia's defense sector and its aging workforce arguably face a highly uncertain future. Some Russian analysts close to their nation's defense establishment view the Ukraine war as a source of both opportunity and challenge, of which the net result over the long term very well could be positive. They contend that while the war has cut off Russia from the West and will cause significant economic contraction of the national economy overall, the defense economy will become larger and far more important as the overall economy becomes more securitized and militarized. By this logic, Russia's defense sector will be the domestic winner as it

supplies the enormous needs of the military—a military that can afford to spend its money because the Russian state is cash rich owing to its still-robust energy income and extensive financial reserves. In this scenario, such domestic demand will more than compensate for any sharp drop-off in arms exports.

The more pessimistic scenario for Russia's defense industry, and arguably the more realistic one, is that Russia's defense sector faces dire straits overall. Domestic war mobilization efforts likely would mean supplying weapons on an IOU basis to a Kremlin that is long on requirements and short on cash to pay for them. Meanwhile, foreign technological inputs have become harder to obtain at scale and export markets that in the past generated vital hard currency revenues for the Russian defense sector now are being crimped seriously.³⁷ Buyers fear running afoul of Western sanctions and—fairly or not—find their confidence shaken by myriad instances of American, European, and Turkish military systems asymmetrically devastating Russian land-combat systems, air-defense systems, helicopters, and tactical jets. Many of the armaments thus imperiled are operated by Russia; much of Ukraine's own legacy systems are similarly of Russian origin. Overall, the Russian defense economy's trifecta of distress presents strategic opportunities to China.

Beijing probably has relatively little interest in the staple Russian systems suffering physical and reputational damage on battlefields in Ukraine. Three decades of effort and more than \$3 trillion of defense expenditures since 1992 have closed most of the technology gaps in surface warships, aerospace, and missiles that formerly drove Sino-Russian defense dealings. Additionally, Ukraine delivered critical Russian technology to China in substantial quantities, which helped China to reduce the gaps further. Among the most blatant examples of this technology transfer are the *Liaoning* aircraft carrier's hull; the prototype fighters that China turned into the J-15 fighters to fly off the carrier's ski-jump deck; the extensive consultancy services connected to finishing the hull, with *Varyag*'s lead designer Valery Babich involved throughout the process; and the training of the pilots.³⁸ Moreover, China has targeted Russia's defense industry further with industrial espionage and reverse engineering while leveraging the world's largest organizational apparatus for acquiring and applying strategic foreign technologies by all means possible.³⁹

But a handful of critical Russian strong points still interest China—perhaps none more than submarine and undersea-warfare technologies. Rumors have swirled for years about assistance provided by Russia's Rubin Design Bureau to China's Type 093 nuclear-powered attack submarine (SSN) and Type 094 nuclear-powered ballistic-missile submarine (SSBN) programs.⁴⁰ In the 1990s, one experienced interlocutor relates, "Russian military officials said that they were talking with the Chinese about providing expertise and technology on

submarine quieting capabilities, on which the Chinese were especially behind the curve.”⁴¹ A cyber attack on Rubin disclosed in April 2021—reportedly exhibiting “Chinese characteristics”—strongly suggests that Russian entities still possess troves of data and expertise that PRC submarine designers, builders, and operators hope to access and use.⁴² Moreover, there reportedly have been extensive joint Chinese-Russian research activities relevant to antisubmarine warfare, including regarding fiber-optic hydrophones.⁴³ Real-world events amplify PRC motives to obtain as much Russian submarine-design and -operations data as possible. In an outstanding recent example, unnamed Pentagon officials disclosed to the television news program *60 Minutes* that in the summer of 2018 one of Russia’s most modern nuclear-powered guided-missile submarines (SSGNs), the Yasen-class boat *Severodvinsk*, entered the Atlantic and eluded NATO trackers for “weeks.”⁴⁴

Technology and expertise transfer could occur along six primary vectors. The first would entail individual Russian defense firms transacting with Chinese counterparts. China’s acquisition of Russian defense technology and expertise was intense and voluminous in the 1990s after the downfall of the Soviet Union.⁴⁵ Russia subsequently has sought to constrain these channels, especially the recruitment of scientists and engineers. Today, as Russia’s defense sector mobilizes more fully for war (meaning assertion of more Kremlin control over a broader subset of decision-making), this is a less likely path.

A second path would entail PRC leadership making future assistance to Russia (financial, military, or otherwise) contingent on access to key technologies of interest. Paths three and four would come into play if the Kremlin continued withholding technology and expertise to which China sought access. The third path would involve PRC recruitment of Russian experts seeking economic opportunity and refuge abroad, and the fourth would involve cyber attacks aimed at exfiltrating data from Russian entities with relevant technologies (although this is probably already under way in a broad sense).

A fifth possible vector is more operational: transferring tactics, techniques, and procedures (TTPs) for submarines (or other forces) during combined exercises, such as future iterations of VOSTOK/ZAPAD or JOINT SEA. A sixth potential area for Sino-Russian technology transfer is sharing intelligence, particularly as a Russian advantage that Moscow might seek to barter with Beijing (e.g., acoustic intelligence on U.S. and allied submarines and other undersea systems and access to data from Russian sonar networks/assets in regions China might not be able to access readily).

In practice, the first four technology-transfer pathways probably will occur simultaneously, with their relative emphases and trajectories depending on case-specific circumstances. Robust trade relationships—some of them covert—already exist between the Russian and PRC defense sectors, offering multiple

pathways and suggesting a substantial degree of PRC institutional familiarity with Russia's defense-industrial ecosystem.⁴⁶

Regardless of the specific channel(s), additional Russian submarine technology and possibly operational expertise worth billions of dollars could be fed into China's military-industrial juggernaut. If that occurred, its capacity for assimilating foreign technology, adapting it to local needs, and producing at scale would be globally destabilizing and seriously inimical to U.S. national-security interests. China's massive investments in long-range anti-air and anti-ship missiles already have eroded U.S. and allied surface and air forces' ability to operate near the PRC's periphery at a given level of risk, but American submarines and undersea warfare have hitherto been affected far less by these rapid improvements in counterintervention capabilities. As the sea surface, air, and space realms increasingly are contested, this remaining area of American undersea dominance offers increasingly irreplaceable options. Contributions from a Russia under duress, in theory, could offer a fast-tracked "great leap forward" for PRC undersea-warfare capabilities and acoustic intelligence to inform their employment, thereby shifting the Sino-American military balance of power significantly during this critical decade.

The reality may prove complicated, however. China's absorption of Russian (and former Soviet) defense technologies and knowledge during the 1990s and the following decade allowed China to catch up by a generation or so in specific areas in which China was able to obtain key technologies. This is a key factor in the impressive progress that China's defense sector has made, in addition to its domestic sources of innovation and upgrading. A further wave of Russian technology and knowledge inflow to the PRC system could offer similar effects, but almost certainly would be less impactful than the initial tidal wave of support during the twenty years following the collapse of the Soviet Union.⁴⁷

Russia increasingly is running short on military technologies and systems of interest to China. PRC government purchase of Su-35s suggests some continued desire to augment indigenous capabilities, but China is now equal or superior to Russia in many defense technological areas and disciplines. Definite remaining exceptions include submarine design and quieting. Possible noteworthy exceptions include selected aspects of the most advanced military jet engines and the SA-21 (S-400) Triumf surface-to-air missile system that China has procured from Russia.⁴⁸ The Pentagon's 2021 China report elaborates that "[t]he PLAAF [People's Liberation Army Air Force] conducted its first SA-21 test fires in December 2018. The PRC is also developing its indigenous CH-AB-X-02 (HQ-19), which will likely have a ballistic missile defense (BMD) capability."⁴⁹ "Many of the PRC's missile programs are comparable to other international top-tier producers," the report judges, and "the PRC may try to use aspects of the S-400 surface-to-air missile . . . system

it began receiving from Russia in 2018 to reverse-engineer capabilities it lacks.”⁵⁰ There is reportedly already direct precedent for such an approach in China’s basing of the HQ-9 family on S-300 SAMs purchased from Russia. Beyond these extant Russian naval and aerospace systems, technologies under development in Russia in potentially pivotal emerging areas such as hypersonics, space systems, artificial intelligence, and quantum technologies also may attract PRC interest.⁵¹

China already has obtained and incorporated large amounts of Russian technology into its existing weapon systems, assimilated knowledge, and improved it to the point that little Russian military hardware and expertise remain superior to those of China. China is particularly strong with respect to ballistic missiles, cruise missiles, and SAMs—all improved substantially through the incorporation of Russian technologies. China’s most-advanced deployed cruise missiles, the YJ-12 and -18, are derived from Russian designs handed over fifteen to twenty years ago. China’s Yu-6 and -7 torpedoes use Russian-derived propulsion systems. The Type 093 SSN’s towed-array sonar is based on Russian technology transferred years ago.⁵² Russian aircraft no longer offer much that China does not have already, in part because China has obtained and emulated Russian aircraft so aggressively since the 1990s.

Given its lack of long-standing experience with advanced engines and potential concerns with its current inventory, China still may benefit from acquiring additional numbers of certain types of Russian engines. Interest in engines and other reverse-engineering opportunities similarly may explain why China procured twenty-four Su-35s from Russia despite its own rapid military aviation progress. The Pentagon’s 2021 China report summarizes the mixed state of PRC jet engines as follows:

[T]he PRC’s aviation industry is unable to produce reliable high-performance aircraft engines and relies on Western and Russian engines, such as the Franco-American CFM Leap 1C that powers the COMAC C919 [commercial aircraft] and the Russian D-30 that powers the Y-20 [military transport] and H-6K [long-range strategic bomber] and H6-N [nuclear-weapons-delivering bomber] variants. The PRC is developing the CJ-1000, AEF3500, and WS-20 high-bypass turbofan engines to power the C919, CR929 [commercial aircraft], and Y-20, respectively.⁵³

Indeed, the WS-20 already has appeared on the Y-20.

Looking forward, China already may have obtained much of what it could from Russia regarding jet engines writ large. China’s WS-10 engine appears to be employed on the J-20 low-observable fighter, whose large deployed numbers (over 150) suggest overall satisfaction with the aircraft—and hence with its engines, which are so central to performance.⁵⁴ Technologies associated with Russia’s AL-21F Saturn engine seem to have helped the WS-10 achieve thrust vectoring and other relatively advanced capabilities. The Pentagon assesses that China’s

H-6K “features more-efficient turbofan engines for extended-range” and that “the PLAAF is preparing upgrades for the J-20, which may include . . . installing thrust-vectoring engine nozzles, and adding super cruise capability by installing higher-thrust indigenous WS-15 engines.”⁵⁵

These characteristics and performance parameters are only at the level of American or Western European military jet engines circa 1985, but that reflects persistent limitations in both Chinese and Russian engines. Having never achieved the levels of the most cutting-edge Western European (British/French) and American engines, both Russia and China have compensated partly by maximizing engine power at the expense of requiring frequent overhauls and limiting engine life—options that are available for military jet engines procured in sufficient numbers but would be completely impracticable for their civilian counterparts.

PRC technology acquirers likely will remain interested for some time to come in both Russian materials science and engine-control software. Aviation software (e.g., for jet engines) can be extremely difficult and time-consuming to produce on a per-line basis, because of requirements concerning annotation, documentation, line traceability, integration, and module and robustness testing. Depending on the baseline against which it is measured (random application code, non-aviation industrial code, etc.) the total effort multiple for aviation software can range between ten- and fiftyfold. How to handle the relevant engine software is therefore a key question for any exporter of packages that include jet engines. The United States typically is able to avoid divulging source codes, despite repeated requests from customers such as Israel, because its military aircraft are so desirable.⁵⁶ With China already able to produce airframes equivalent to or better than their Russian counterparts, a conundrum arises whereby Russian jet engine makers either might have their hands forced or, conversely, might fight harder to retain the proprietary know-how that gives Russian engines the last increments of performance edge relative to Chinese-made ones.

Russia’s remaining zenith technologies and systems also include significant space and cyber capabilities; the latter are beyond the scope of this article but are broadly evident. With regard to space, Moscow has leading technology- and geography-based advantages in intelligence access and global instrumentation, however reluctant it may be to provide access to or to bargain with them. These advantages include a wide range of space and maritime tracking and observation facilities, signals-intelligence sites, and other clandestine and covert-collection instrument accesses.⁵⁷ Beyond technology per se, and specifically regarding access for intelligence facilities and networks, China could seek greater intelligence collaboration with Russia, particularly against the United States and the EU. Beijing seeks access to sites for global instrumentation for all manner of

terrestrial and space surveillance and well-developed networks for access and finished analysis—both areas to which Moscow has applied extensive resources and effort since the early years of the Cold War.

An example of an issue in which Sino-Russian national interests aligned and resulted in technical and policy alignment of their shared concerns is the two countries' collective attitude regarding American Terminal High Altitude Area Defense (THAAD) system deployment to South Korea. The end result prompted their collaboration on ballistic-missile defense.⁵⁸ Their partnership began as copious joint statements in the wake of the THAAD deployment to the Republic of Korea, then matured into joint military drills, and continues today.⁵⁹ This represents meaningful collaboration in an area in which China remains behind (ballistic-missile warning and responses).

Collaborative ballistic-missile early-warning-system (BMEWS) development and related information sharing started decades ago and may be an area for further relationship expansion between Russia and China. "In the event of system integration, stations located in the North and the West of Russia could provide China with warning data," suggests a leading Russian expert on Sino-Russian military-technology issues. "In turn, China could provide Russia with data collected at their Eastern and Southern stations. This would enable the two countries to create their own global missile defence network."⁶⁰

In the undersea-warfare domain, China already may have received at least some of the remaining critical Russian technologies, with these inputs in the process of bearing fruit but not yet conclusively verifiable through open sources. The production pace and acoustic characteristics of China's Type 095 SSN, likely soon followed by China's Type 096 SSBN, will be the key indicators. If the Type 095 is as far along and promising in development as it seems, then key technology transfer has occurred already. China now is making the reactor and the advanced sound mounts it needs for the Type 095 SSN and Type 096 SSBN; the question is how advanced they will prove in practice. Joint Sino-Russian development of nuclear reactors circa 2010 gave China access to the Russian KLT-40S commercial reactor, for which Russia sold or provided the technological data or a baseline prototype. The KLT-40S design is very similar to the OK-650 reactors on Russian third-generation submarines. China's own ACPR50S reactor appears to have benefited from these Russian inputs, and therefore has the potential finally to offer China a baseline for high-power, quiet nuclear-submarine propulsion.

According to International Atomic Energy Agency nuclear-information specialist Viet Phuong Nguyen,

Despite initially considering to import floating NPP [nuclear power plant] technology from Russia, in 2016 China announced its first Chinese floating nuclear project using a 200 MWt (60 MWe) ACPR50S reactor designed indigenously by the China

General Nuclear Power (CGN), which was followed by a joint-venture led by the main competitor of CGN in the domestic nuclear market—the China National Nuclear Corp. (CNNC) in 2017 based on its own 310 MWt (100 MWe) ACP100S model. Aside from CGN and CNNC, other types of floating NPPs based on fast reactors have also been under research and development in China.⁶¹

Along these lines, China began building a functional ACPR50S reactor prototype in 2018, finished it in 2021, and has been testing it in 2022. The pneumatic sound mounts, produced in a variety of relevant sizes, appear to be akin to the Russian Rubin Bureau's APRK mount and undoubtedly will be used in the PLAN's next generation of nuclear submarines. China has heretofore pursued parallel SSN and SSBN development and construction, suggesting a desire for cost savings rather than a lack of satisfaction with design issues; it is possible that China finally dived in with a detailed Type 095 SSN design around 2018 and possibly began construction of hull sections by 2021. If China successfully has adopted Russian approaches to quieting (including a large table raft with pneumatic sound mounts, and either a large low-revolutions-per-minute steam turbine or a direct-drive electric motor, and a pump jet propulsor) this will require significant volume—far more than the current Type 093A can provide. Should China's Type 095 SSN and Type 096 SSBN be much larger than their respective Type 093 and Type 094 predecessors, then this would be a strong indicator of pursuing Russian quieting techniques.

Beyond these particular submarine technologies, there may remain several true capstone capabilities that even a Russia under subservient leadership would be hesitant to transfer, because its own military is only now in the process of applying them in very small platform numbers—with no possibility of building out ahead at even a fraction of China's meteoric naval shipbuilding rates. The transfer of such apex technologies—an extremely unusual practice for any nation that possesses them—would imperil Russia's few remaining areas of military advantage. China appears to have access already to Akula-level quieting, which may be the last frontier that Russia feels comfortable making available. Even in extremis, Moscow might hesitate to give Beijing the “keys to the kingdom” beyond this: the K-560 *Severodvinsk*, a Project 885 Yasen-class nuclear-powered guided-missile submarine, which is still quieter.

Beyond that, only one Russian navy submarine, the Project 885M *Kazan*, has next-level quieting technology. Russia is motivated further to guard its remaining state-of-the-art capabilities because of the extremely limited scope, scale, and overall sophistication of its naval shipbuilding industry. Russian shipyards struggle to build vessels larger than corvettes, with production of sufficiently powerful gas turbines being a major bottleneck. In part, this is yet another reflection of Russia remaining far behind the United States and Western Europe in

production of aeroengines. In part, it also results from Russia's post-2014 Crimea invasion breakdown of military-industrial relations with Ukraine, a country with which Russia's key defense infrastructure was intertwined as a legacy of Soviet planning. Ukraine previously had been the supplier of naval gas turbines to Russia, and similar problems resulted from lack of access to Ukrainian aeroengine technology after 2014.

Beyond the realm of technology and intelligence, there is one major military advantage that Russia conceivably could offer to China: naval, and possibly air, basing access in geographies of high strategic interest. China seeks overseas basing and access in a range of countries, but none of the current or likely additional near-term locations have airfields yet.⁶² Occasional access to Russian airfields could enable Chinese Y-20s to refuel or have crew rest, thereby extending options for military diplomacy, noncombatant evacuation operations, and other activities farther from China.

For more-sensitive military aviation operations, access to Chuguyevka Air Base north of Vladivostok (from whence Viktor Belenko defected by flying his MiG-25 to Hakodate, Japan, in 1976), the Dolinsk Sokol Air Base on Sakhalin (from whence came the Su-15 that shot down commercial airliner KAL 007 in 1983), Yelizovo in southern Kamchatka, or Klyuchi in northern Kamchatka would be relevant for establishing new PLA aerial vectors of approach to Japan or to reconnoiter/interdict American air approaches from Alaska, including the Aleutians. Some of these could require infrastructure upgrades to host a PLAAF presence.

On the naval side, access to Russian Pacific Fleet facilities would facilitate a sustained PLAN presence in the Sea of Japan. The most strategically meaningful step for Moscow would be to grant PLAN SSBN access to Russia's two major submarine ports: the Rybachiy submarine base near Petropavlovsk on the Kamchatka Peninsula in the Pacific and the Sayda-Guba (Sayda Bay) submarine base on the Kola Peninsula in the Barents Sea. Cold War operations may suggest a limited-access model: U.S. SSBNs used to operate out of Holy Loch, Scotland, and Rota, Spain, but still pulled in to Faslane, Scotland, from time to time. They were not homeported there, but access allowed them logistical support to operate better and far forward. Alternatively, to operationalize such an opportunity fully, particularly given current limitations in Russian infrastructure, the PLAN conceivably might seek a dock and dry dock at Rybachiy, or Sayda-Guba, or both, and it might base a submarine tender there—all highly visible signs for which to monitor. Even if Chinese submarines used Russian infrastructure to try to maintain a lower profile, the exposed open-air piers of Rybachiy or Sayda-Guba would permit regular overhead observation via optical and synthetic-aperture-radar satellites, among other means.

A major appeal of Russian port access would be to allow PLAN SSBNs to operate within protected bastions from which their submarine-launched ballistic missiles (SLBMs) could range key targets while minimizing U.S. and allied submarines' ability to track, trail, and hold them at risk. China doubtless is extending the range of its JL-2 and next-generation JL-3 SLBMs, including by replacing aluminum skin with lighter composite materials, but it has not yet demonstrated mastery of SSBN quieting and clearly lacks experience. Type 094 SSBNs seem too noisy for effective open-ocean deterrence patrols.⁶³

Within a bastion in the Sea of Okhotsk that Russia works so hard to protect, China could deploy SSBNs with next-generation JL-3 SLBMs that might well have range to reach anywhere in the continental United States, including Washington, DC, via great-circle routes. Rybachiy also would offer proximity to Arctic sea-lanes in which PLAN strategists have expressed great interest for naval presence in general and potential incipient submarine operations in particular. The Kamchatka Peninsula port is navigable year-round for priority vessels such as submarines that could have icebreakers assigned to them to clear channels through any ice. While Sayda-Guba is far from China, it lies within a bastion that Russia has even greater capacity to protect, and it would allow even range-limited JL-2 SLBMs to cover Europe fully and most of North America.

The Pentagon's 2019 China report states that "a strengthened Chinese military presence in the Arctic Ocean . . . could include deploying submarines to the region as a deterrent against nuclear attacks."⁶⁴ The Russian military historian Alexander Shirokorad articulates precisely such an approach. After highlighting the challenges that PLAN SSBNs face in operating undetected in Asia-Pacific waters and in covering the continental United States, he suggests, "In venturing to the Arctic, the Chinese 'immediately kill two birds with one stone': significantly decreasing vulnerability and simultaneously reducing the distance to potential targets."⁶⁵

At a minimum, the following low-end model appears to be relatively likely: China has not learned lessons of operations in the Far North yet, it aspires to be there for competition and to protect northern passage sea-lanes for PRC trade, and it wants to develop a partnership that may facilitate technology transfer from Russia (particularly if economically advantageous). If Russia and the United States, and any other nation, are going to operate there, then—even if only for the peer recognition—China will want to operate there also. It may do so only episodically (annually), with perhaps a cooperative visit to Rybachiy, such as during a VOSTOK exercise. With further development of land-attack cruise missiles, the PLAN could extend reach and threat axes, but it is probably better suited to operations in the northwest Pacific and even the northern Pacific.

Sino-Russian interactions over the past decade concerning the Arctic have been more tense than would be expected from countries that truly saw each other

as strategic partners. For instance, Russia blocked Chinese vessels from conducting surveys along the Northern Sea Route in 2012 and in 2020, and Russian officials arrested the head of the Arctic Civic Academy of Sciences on charges of providing classified information to PRC intelligence entities.⁶⁶ On the basis of recent trends, it appears that Russian distrust will modulate Sino-Russian Arctic cooperation aside from very specific areas, such as investment in energy facilities. PRC access to Arctic-adjacent submarine facilities would be a game changer sufficient to warrant continued close observation, although the probability of such events manifesting appears uncertain. Time will tell.

Russian behavior in the South China Sea may offer a glimpse of at least one plausible future for Sino-Russian Arctic interactions. Rosneft's Vietnamese subsidiary has continued drilling within Vietnam's exclusive economic zone despite PRC displeasure and China Coast Guard harassment. Russian foreign minister Sergey Lavrov apparently declined a 2019 request by PRC foreign minister Wang Yi to halt Rosneft's drilling in that area.⁶⁷ The self-interest governing the actions of Russia—and its parastatal firms—as well as the geopolitical dimension would be magnified in the Arctic region. Unlike the distant South China Sea, the Arctic is a proximately located zone of high importance to Russian economic and national-security interests. This brings us to our concluding section surveying potential future paths and pitfalls for relations between Russia and China.

WHAT COULD DERAIL DEEPER SINO-RUSSIAN STRATEGIC SECURITY ALIGNMENT?

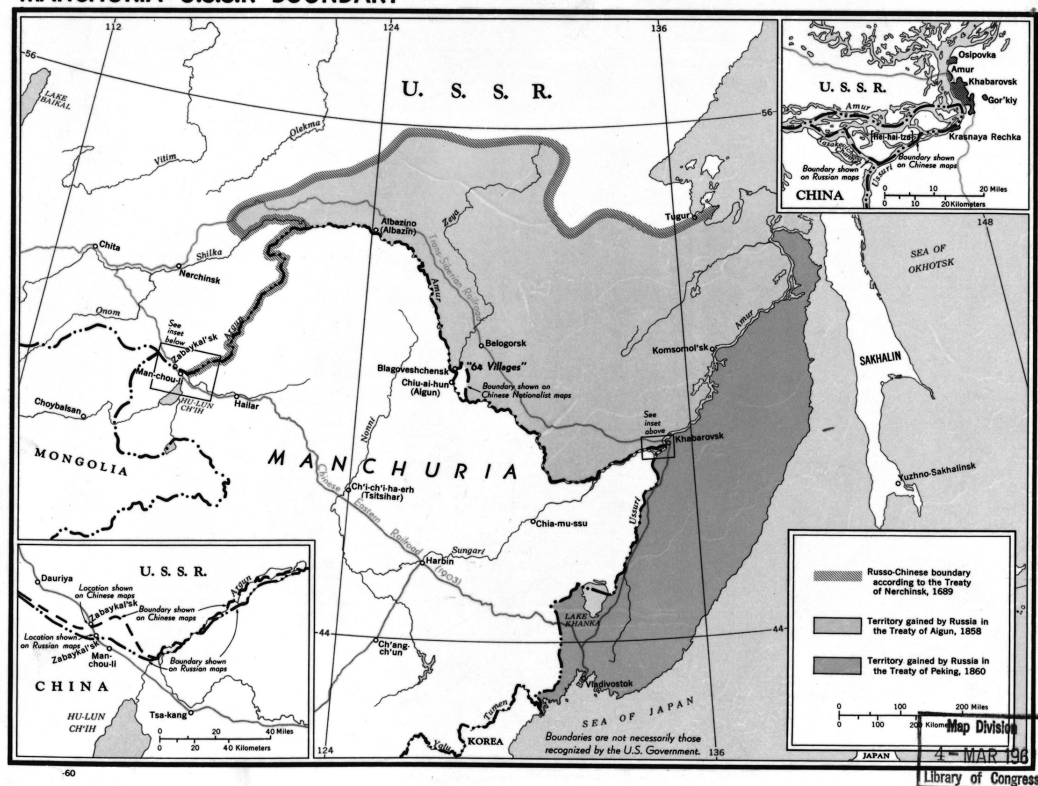
The ambitious nationalistic autocrats leading China and Russia share a powerful desire to undermine a rules-based order that they consider the bedrock of an American-dominated international system and that impedes their prerogatives and historical missions.⁶⁸ Yet a broad common objective of eroding U.S. dominance does not eliminate fundamental sources of friction and suspicion that on a multiyear time frame plausibly could curtail or even derail entirely Sino-Russian partnership, and with it maritime-security cooperation. Indeed, this has happened already at least once in relatively recent history, with the 1960s Sino-Soviet split. The two countries' shared history is what one might expect that of two adjacent empires to be: variable over time, but with a tendency toward storminess and tremendous vicissitudes. Jo Inge Bekkevold encapsulates the relationship this way: "During the last century, China has seen Russia as imperialist, a comrade in arms, a foe, and a partner, and it is now discussing whether it should be an ally."⁶⁹ Shared opposition to the United States and its allies has driven recent Sino-Russian rapprochement under Xi and Putin, yet various dynamics could upset this powerful alignment in the future.

For four centuries, the Russian Empire averaged fifty square miles' expansion daily, and came to encompass one-sixth of the earth's landmass.⁷⁰ As Russia grew in the sixteenth and seventeenth centuries, with Cossacks, fur traders, and settlers forging their way east toward the Pacific, conflict ensued. As mentioned above, the Treaty of Nerchinsk—signed in 1689 after multiple Qing attacks on the Russian fortified settlement at Albazin—bought nearly two centuries of peace amid Chinese decline.⁷¹ Then, during the Opium War period, an embattled Qing dynasty signed the Treaty of Aigun (1858), followed by the Treaty of Peking (1860), codifying Russian seizure of Chinese territory roughly one and a half times the size of Texas (see exhibit 4).⁷²

The lands in question have remained in Russia since 1860, albeit with lingering historical unease described later in this section. Furthermore, Russia's historical eagerness to position itself as a mediator or arbitrator—purportedly siding with China, but in fact territorially aggrandizing itself at Chinese expense—creates

EXHIBIT 4 MODERN RUSSIAN LANDS OBTAINED FROM CHINA THROUGH OPIUM WAR-ERA TREATIES

MANCHURIA-U.S.S.R. BOUNDARY



Source: *Manchuria-U.S.S.R. Boundary* (Washington, DC: Central Intelligence Agency, 1960), Library of Congress Geography and Map Division, Washington, DC, available at www.loc.gov.

real questions about what kind of “ally” Russia would prove to be in a pinch. If a future conflict triggered a maritime blockade of seaborne energy flows into China, could Beijing truly depend on Moscow to ensure the flows continued unabated and not to exploit the situation to China’s detriment?

Contemporary Russian thought likely emphasizes seeking positional opportunity amid Sino-U.S. confrontation. Political scientist Sergey Karaganov wrote in mid-2021, “Now there is the opportunity to be a balancer amidst Sino-American enmity (with a friendlier stance toward China) and in a new Greater Eurasia.”⁷³ But a greater set of questions arises when accounting for the reality that Beijing sees the world in hierarchical terms (with itself on top), while Moscow seeks to be accorded peer or quasi-peer status far exceeding the demographically declining nation’s power—economic, technological, and soft—on the world stage.

American (and, increasingly, Chinese) international power exhibits qualities of a gravitational force field: often subtle, yet pervasive and hard to resist. Its mere presence reshapes the surrounding environment and the decisions that actors make therein. The same is not true for Russia. The mismatch between the degree of influence Moscow wishes to have and the degree that it actually achieves spurs it repeatedly to seek relevance and recognition through high-risk geopolitical actions—including energy-supply cutoffs, nuclear posturing, invasion of neighbors, and military intervention on behalf of fellow autocratic regimes. China may tolerate some of these behaviors on a tactical basis, as it has done thus far with the Ukraine war. But Moscow’s adventurism and tendency to try to amplify its limited influence through chaos and destruction is ultimately inimical to Beijing’s strategic vision, which is predicated on stability, aggrandizement of Chinese influence and presence, and construction of a new Sino-centric regional and international order.

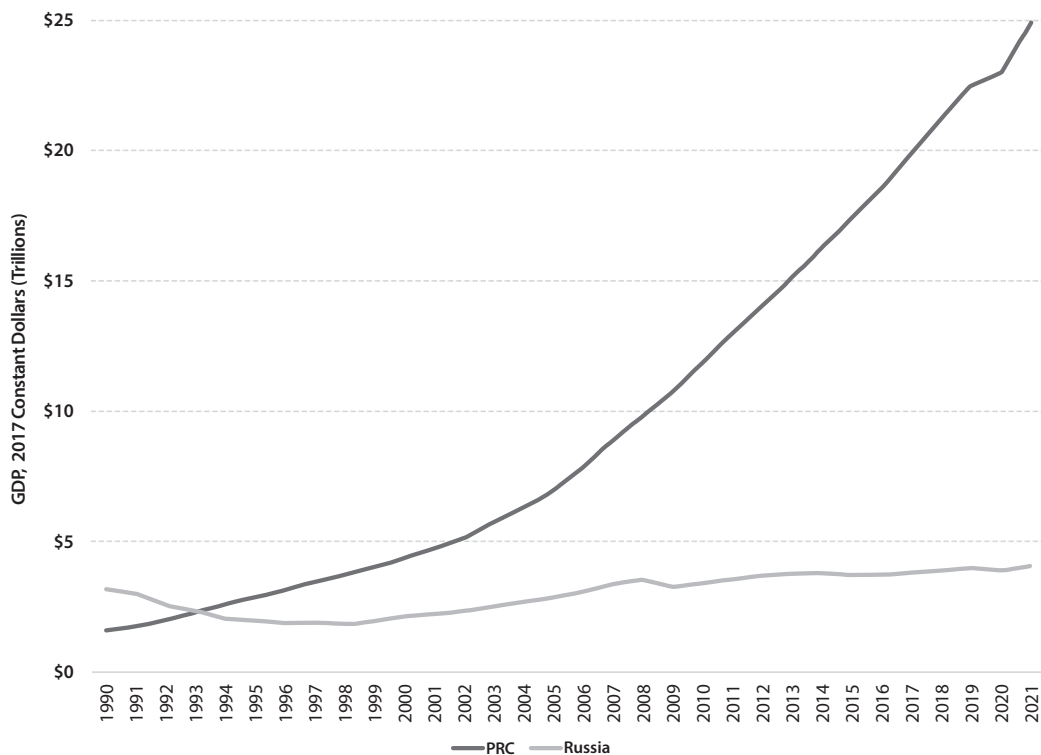
Moscow might attempt to find a way to “compartmentalize” by focusing its chaos and violence-based strategies on Europe and the former Soviet zone while quietly delivering raw materials to the Chinese market. Yet the combination of Russian history—often dominated by aggressive, *Russkiy mir* (Russian world) expansionism—and China’s global economic presence across markets and geographies make this unlikely. Moreover, if Russia’s attempts at conquest in Ukraine prove, eighteen to twenty-four months hence, to have been a failure, the blowback could drive a quiet but angry descent into becoming an internationally isolated PRC resource colony, could spark further violence on Russia’s periphery, and even could foster territorial disintegration. Modern Russia’s multiethnic empire holds seeds of separatism that revealed themselves in the wake of the USSR’s dissolution, first and foremost in the Caucasus. If Russia faces intense and sustained financial constraints, such forces could emerge anew.

Although Russia publicly defines the United States as its “Number One National Threat,” China likely arouses a broader and more primal unease,

particularly given the demographic and economic disparities between sparsely populated Siberia and the Russian Far East and their PRC neighbors to the south.⁷⁴ Indeed, for all the rhetorical broadsides the Kremlin fires at America, Washington does not have pretensions to Russian territory, whereas a future Chinese government that reverted to the contentious historical mean of the two empires' relationship might. In their rawest form, Eurasian power politics generally dictate that the weak cede territory to the strong. But unlike the Opium War period, the world of 2022 and beyond finds China far more likely to occupy the position of strength—as evidenced by the PRC economy's explosive outpacing of its Russian counterpart since the mid-1990s (see exhibit 5).

The simple hint of future sovereignty shifts can destabilize contemporary relations rapidly—a reality that Henry A. Kissinger (as national security advisor and Secretary of State) recognized as he and President Richard M. Nixon crafted their approach to China in the early 1970s. Roughly a decade later, in his memoirs, Kissinger opined, “No compromise of Chinese boundary claims could alter

EXHIBIT 5
ECONOMIC OUTPUT OF PRC AND RUSSIAN FEDERATION, TRILLIONS OF 2017
CONSTANT DOLLARS (PURCHASING POWER PARITY)



Source: World Bank, www.worldbank.org.

the fact that sometime in the next generation the disparity between Soviet and Chinese power in Asia would first narrow and then tilt the other way; from then on, Siberia's future would depend increasingly on Peking's goodwill, which no Chinese government could ensure for eternity."⁷⁵ While Kissinger's policy recommendations regarding China arguably have not aged well, here he highlights a geopolitical dynamic that may well emerge in the future.

A 2020 flap over the celebration of Vladivostok's founding highlights the potential latent problem. After the Russian embassy in Beijing posted a video clip on social media platform Weibo commemorating Vladivostok's 160th anniversary, a journalist of the state-owned CGTN television network shot back that Vladivostok's location "was Haishenwai as Chinese land, before Russia annexed it via unequal Treaty of Beijing."⁷⁶ While this was couched as a "personal view," the reaction across a swath of PRC commentators—including the cultural counselor at the PRC's embassy in Pakistan—echoed the sentiments, and in doing so raised questions about how PRC officialdom's views might evolve if Russia were to continue weakening.⁷⁷ To put the matter in perspective, it would be hard to imagine a journalist at *Deutsche Welle* musing about the possibility of Germany reassuming control of Alsace-Lorraine from France and then having that view amplified by many other commentators, including senior German diplomats, while Berlin watched silently in the background.

Putin's own actions have accelerated the growing disparity of means and power between the two countries, and in doing so have intensified the pressures described above. The invasion of Ukraine eliminated the space for nuanced strategies of "partial alignment" that would have positioned Russia to capitalize on intensifying competition among the United States, the EU, and China and instead places the double-headed eagle in a more binary position. Russia could take the currently unlikely path of winding down the war in Ukraine, making amends or paying reparations, or both, and attempting to restore its relationship with the EU. Otherwise, it either could pursue "Seventh Continent" autarky or could align itself more proactively with China in the economic, political, and trade spheres—with both paths leading to alienation from Europe and deeper, more asymmetrical reliance on China. This increasingly unilateral reliance and its incongruence with Russia's great-power self-image portends a prospect underscored earlier this year by the Stimson Center's Yun Sun: "China and Russia can only share miseries, but not happiness" (中俄只能共苦, 不能同甘).⁷⁸

In a cruel irony, Putin launched his war on Ukraine in part to keep it from escaping Russia's orbit by integrating more deeply with Europe, and yet Europe was also the strategic rear area Moscow needed to ensure a semblance of balance in its growing ties with Beijing. Russia now likely has forfeited access to this refuge and revenue, potentially for decades to come—barring a major course change in

either the Kremlin or key Western capitals—and stares east into what Kissinger foresaw four decades ago: an economic and political power balance that now favors China tremendously.

Had Russia preserved positive relationships with both Europe and China, East and West would have competed for access to Siberia's commodity warehouse. Russian firms would have access to global capital markets to fund the infrastructure necessary to move resources to market, and Russia would occupy a powerful, pivotal position. But instead of pursuing the path of what we dub a "giant Qatar," Moscow instead is sacrificing commercial relationships and trust for blood and soil in Ukraine, thereby turning Russia into Gabuev's supersized "Eurasian Iran." China is now Russia's only continent-scale market option; even as Russia works to sell commodities into smaller markets across the global South, it will rely foremost on PRC market revenues to finance the infrastructure needed to reach its other export markets. That is an inherently weak position, and Beijing will exploit it quietly under the banner of "partnership without limits," while Gazprom delivers gas through the self-funded Power of Siberia pipeline at half the price it fetched in the EU in 2021.⁷⁹

Given these factors, the next three to five years mark the core window of danger from an American national-interest perspective. Russia's financial duress will peak during that period before the country either changes leadership and policies or adapts more fully to a new normal of deeper pariahdom than was the case during the first round of sanctions between 2014 and 2022. The probability of Russian firms transferring certain military crown-jewel technologies—such as those pertaining to undersea warfare—also could peak during the unfolding era of maximum pain that precedes structural adaptation to the new regime of isolation and relative autarky. If such technology transfers occur, the duration of specific state-level security alignments of Russia and China likely will come to matter less, because Beijing already will have obtained the source-code inputs that it values most highly. Once China assimilates key technologies and knowledge, improves incrementally on them, and feeds them into its world-scale development and production apparatus, it will be able to chart a path ahead with minimal Russian participation or influence.

This is precisely what has happened previously in the realm of military aviation, most emblematically with Flanker-class fighter jets. Russian manufacturer Sukhoi first supplied Su-27 kits for assembly in China during the middle of the first decade of this century. China subsequently began producing an indigenously upgraded version—in violation of the coproduction agreement. Now, roughly fifteen years later, China has developed the indigenous J-11 and -16 series Flanker derivatives that the Royal United Services Institute assesses to have a "superior level of overall combat capability to the latest Russian Flanker, the Su-35S."⁸⁰ According

to Sarah Kirchberger, “Russia was reportedly even willing to provide source codes to China’s Shenyang Aircraft Corporation to enable the integration of Chinese weapons.”⁸¹ It is entirely plausible to envision a similar pattern unfolding in the undersea-warfare domain if Russia deepens its technology transfers during the coming period of maximum financial distress, during which Chinese technology buyers will be able to stay patient and opportunistic for longer than Russian naval vendors can remain solvent, owing to sanctions, dwindling international orders, and domestic military emphasis on fighting a land war of conquest in Ukraine. Meanwhile, however, recent espionage cases in which the Russian government has detained Russian experts could indicate growing distrust on Moscow’s part.⁸²

With regard to Ukraine itself, Russo-Chinese differences may emerge with time and events. Since the beginning of the conflict in Ukraine, to maintain friendly relations and cooperation with Russia and minimize questions concerning Xi’s personal embrace of Putin and Sino-Russian cooperation, China neither has condemned Russia’s actions in Ukraine openly nor actively upheld the sovereignty and security provisions accorded to Ukraine as one of the two parties to the 2013 PRC-Ukraine Treaty of Friendship and Cooperation and associated joint communiqué—both signed by Xi himself. However, China generally has refrained from questioning Ukraine’s sovereignty and territorial integrity, has urged the parties involved to resolve their differences through dialogue and negotiations, and has proposed peaceful settlements in theory. Therefore, China’s posture overall largely has been to avoid contradicting outright the language of the Sino-Ukrainian agreements of 2013.⁸³

Even short-term Sino-Russian alignment under Xi and Putin could threaten the United States and its allies and partners severely. Joachim Krause goes so far as to argue that “a Russian-Chinese alliance might not last too long . . . but such an alliance might pave the way—either directly or indirectly—for wars of a dimension we would not have seen since the Korean War or World War II.”⁸⁴

This leaves us to consider a recent Sino-Russian activity and what it may mean for the future. Nearly seven months after Putin invaded Ukraine, on 19 September 2022, U.S. Coast Guard cutter *Kimball* encountered a Russo-Chinese naval formation while on routine patrol in the Bering Sea eighty-six miles north of Alaska’s Kiska Island. The seven vessels (three PLAN, four Russian navy) subsequently broke formation and dispersed.⁸⁵ Clearly, many uncertainties loom for Sino-Russian relations in coming days, months, and years.⁸⁶ Whatever the trajectory, the implications will be tremendous.

This article has probed emerging and potential real-world developments and dynamics stemming from Putin’s shocking invasion of Ukraine, with a particular focus on the implications for Sino-Russian strategic and maritime-security dynamics.

Areas addressed include the prospects for greater Russo-Chinese energy and resource transactions and sharing of undersea-warfare technology. Areas briefly explored include the theoretical possibility of more permissive PRC access to Russian Arctic sea-lanes and ports, above all for SSBNs—a highly uncertain but portentous prospect. Areas beyond the scope of this article that merit further research include

- The prospect of even greater Russian support vis-à-vis China's territorial claims, particularly Taiwan, including through active coordination and in wartime contingencies
- PRC lessons from the Ukraine war and influence on Xi's approach and timeline vis-à-vis possible Taiwan scenarios
- The potential for increased PRC access to or influence in the Sea of Japan (e.g., through the Tumen River outlet and supported by Russian Pacific ports)
- The alignment and potential roles of U.S. Indo-Pacific allies and partners

These factors will play out at the strategic, operational, and tactical levels. At the strategic level, embargoes, sanctions, and military operations can have important and unwanted second- and third-order effects on a global scale. The loss of Ukrainian (and Russian) food exports affects many countries, and the loss of access to Russian gas through sanctions and Russian interruption of supplies impacts Europe significantly. The spike in the price of oil and natural gas fuels global inflation and risk of economic downturn, with far worse effects to come this winter. Global supply chains that depend on Russian raw materials such as titanium face disruption. This point offers important reminders of how the world economy is likewise dependent on PRC-origin supply chains and on Taiwanese semiconductors for a wide range of products, while China's economy—and perhaps its domestic stability—depends heavily on raw-material (and increasingly food) imports.

At the strategic-operational level, Russian threats of tactical nuclear weapon employment regarding Ukraine may motivate further increases in China's nuclear stockpile and delivery systems. The Ukraine war highlights the vital importance of munitions, both those stockpiled and those that are rapidly producible. Ukrainian expenditures of advanced munitions have exceeded prewar expectations. U.S. and NATO nations' abilities to mass-produce advanced munitions is limited and depends ultimately on extended supply chains for strategic minerals and integrated chips. The United States and Taiwan are grappling with this challenge and adjusting their procurement plans. The Ukraine war has shown that national resilience (stockpiling supplies, dispersing and hardening key facilities, fortifying national will, mobilizing for combat, and employing unconventional warfare against invasion efforts, *inter alia*) has great strategic and operational value—with manifold lessons for Taiwan.

At the operational-tactical level, the Russo-Ukrainian war demonstrates that effective leadership and well-trained, motivated servicemembers are at least as important as the technology of their weapons. Distributed, ad hoc, tactical command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) networks (e.g., Starlink, unmanned aerial vehicles, and tactical forces) are powerful enablers for combat operations. Distributed tactical C4ISR networks with a decentralized command-and-control philosophy are hard to defeat. Coastal-defense minefields and drifting mines (by both Russia and Ukraine) have impacted Black Sea maritime operations despite the small number of mines employed. In Taiwan's case, large-scale employment of defensive or, more importantly, offensive minefields could be a decisive tactic. The coastal-defense cruise-missile threat is real, especially if the targeted ship is not maintaining constant situational awareness and honoring the threat. Covering a defensive minefield with coastal-defense missiles could combine these effects. Russia's loss of its Black Sea flagship *Moskva* shows once again that extensive, realistic damage-control training is essential for all sailors; material preparation of the ship for combat is key. These are World War II lessons unlearned by many navies during years of peace.

The next three to five years likely are to be the most critical period for a tighter Sino-Russian alignment to shape the regional and global security environments. Russia's financial duress from NATO/OECD member-state sanctions likely will peak by 2025–27, and with it, Russian entities' motivation to share military crown-jewel technologies with China. For its part, China seeks technology rather than hardware, because (1) Russian hardware is underperforming significantly in the Ukraine war thus far and, much more importantly, (2) once PRC firms obtain the requisite know-how, they can assimilate it into their own research, development, and production ecosystems and ensure that Russia would not be able to use future supplies of parts or other aftermarket support to gain leverage over PRC actions or decision-making.

Russia itself lacks the economic heft to be the force multiplier and geopolitical partner to China that many G7 countries are to the United States, but it can nevertheless contribute significantly to China's regional and global strategic positions. As a spoiler, it can attempt to tie down American and allied forces outside the Indo-Pacific for its own purposes, and thereby distract governments in Europe and the United States from focusing as tightly on competition with China as they otherwise might. Russia also has value to China as a purveyor of incremental crude oil and natural gas supplies that, because of sanctions, likely can be obtained at a significant price discount.

Transfer of certain military technologies and know-how could be even more transformative, specifically undersea-warfare technologies that could enhance the

lethality of future PRC submarines and erode the qualitative edge the U.S. silent (but deadly) service currently maintains. A future PLAN submarine force with ten or more Yasen-quality boats could change the regional naval balance to a greater degree than even the budding AUKUS partnership and likely could do so much more quickly, given the scale and velocity at which PLAN naval shipbuilding has operated in recent years. Indeed, such a force would raise a specter that American defense planners last faced during the Cold War: How would the United States logistically support an overseas industrial war against an adversary whose nuclear-powered, guided-missile, and attack submarines can range afield at intercontinental distance from their home ports? And in this case, the distances in the Pacific theater are far greater than those between the United States and Europe. Finally, such a submarine fleet also would expose bases and civilian infrastructure in the U.S. homeland to a credible threat of cruise-missile strikes by the PLAN.⁸⁷

These are all sobering possibilities from the perspectives of Washington, Tokyo, Seoul, Canberra, New Delhi, and other Indo-Pacific capitals. Worse and more complex still, Xi may well view Russia as an essential partner in his ambitions to reshape the international system in China's favor. Xi may need to have Russia look stable—even while perceiving Russia as being in inevitable decline—to preserve its partnership for changes to global governance, for which he may not have the unilateral leverage he once imagined. A more positive possibility for those who support a long-term, rules-based order across the Indo-Pacific comes from Russia's own inflated national sense of self and the real potential for it to undermine the partnership as Moscow chafes at becoming Beijing's vassal. If the quest for restoring Russian pride can prompt an ill-advised invasion of Ukraine, there is reason to think it could drive an ill-considered second Sino-Russian split. But hope is not a strategy, and the United States and its partners simply cannot wait passively for internal division to weaken the present Putin-Xi alignment. However, knowing that centripetal forces of natural disintegration likely will tug at the Moscow-Beijing axis harder and sooner than widely anticipated can help policy makers focus on the areas of highest temporal priority and strategic impact while also seeking diplomatic engagement points that over time can help accentuate and accelerate Russo-Chinese tensions and potentially undermine or reset the two countries' growing energy-maritime security nexus.

NOTES

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is indebted to his colleagues at CMSI for initial discussion and insights; Collins thanks his colleagues at the Baker Institute's Center for Energy Studies for their insights and

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 83. See Andrew S. Erickson, "2013 PRC-Ukraine Treaty of Friendship & Cooperation / Joint Communiqué: Russian, Ukrainian & Chinese Documents, Context, Timeline," *China Analysis from Original Sources*, 29 August 2022, www.andrewerickson.com/.
 84. Joachim Krause, "The Way Forward: How Should Europe Deal with Russia and China?," in Kirchberger, Sinjen, and Wörmer, *Russia-China Relations*, p. 279.
 85. Mark Thiessen, "Coast Guard Spots Chinese, Russian Naval Ships off Alaska Island," *Navy Times*, 26 September 2022, www.navytimes.com/.
 86. For factors that could affect the relationship's future trajectory, see Vasily Kashin et al., *Sino-Russian Relations: Perspectives from Russia, China, and Japan* (Seattle, WA: National Bureau of Asian Research, May 2019), available at www.nbr.org/.
 87. Tom Karako et al., *North America Is a Region, Too: An Integrated, Phased, and Affordable Approach to Air and Missile Defense for the Homeland* (Washington, DC: CSIS Missile Defense Project, July 2022).