Chapter 10
Northeast Asia's Energy Transition–Challenges for a Rules-Based Security and Economic Order

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Abstract Would the rise and political convergence of a dominant gas supplier (Russia) and an outsized consumer (the People's Republic of China) prohibit or facilitate the rise of multilateral energy governance in Northeast Asia? We revisit conventional views on challenges to interstate cooperation on managing energy demand and related infrastructure provision among Japan, South Korea (ROK), and the People's Republic of China. Through a "geoeconomic" analysis that tracks the interplay between national energy transition and the securitization of energy policies, we suggest that Northeast Asia energy interdependence relations are in the process of being drawn into a Eurasian Arctic and heartland framework that mediates great power competition across energy, financial, and diplomatic domains. Against these pressures, Japan, the European Union and the U.S. would need to reconceptualize the geographical basis of a regional liberal institutional order as defined in this book.

Introduction: Energy Transition and Energy Security in Northeast Asia Since the Asian Financial Crisis[1]

This chapter proposes an original perspective on multilateral energy governance in Northeast Asia, aiming to overcome the long acknowledged and studied problems with interstate cooperation on and institutionalization of collective management of energy demand and related infrastructure provision among Japan, South Korea

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(ROK), and the People's Republic of China (PRC) as major fossil fuel consumers. We provide a "geoeconomic" analysis that tracks the interplay between national energy transition and the securitization of energy policies and suggest that coordinated policies that bring together a mix of market mechanisms and government-supported (although not necessarily interstate) institutionalization could address the structural needs of these countries in a way that is consistent with the paradigm of a regional liberal institutional order as defined in this book.

The first section below summarizes conventional explanations for a lack of impetus toward collective energy security in Northeast Asia, despite expert proposals that reflect tangible national benefits from cooperation. The second section updates market trends and strategic responses from governments, corporate and social interests. The third section suggests pathways to cooperation and possible scenarios of geopolitical polarization of energy policies. We conclude by extending our basic analysis to consider the unfolding impact of Russian invasion of Ukraine in 2022 on Eurasian energy geoeconomics, in particular how fossil fuel markets will be realigned and whether renewables, including the highly touted green/blue hydrogen technologies, could affect fundamental incentives for regional cooperation.

A. Northeast Asian energy cooperation since the late-1990s.

The Asian Financial Crisis and its immediate aftermath of 1997–9 denote a significant shift in national energy policies and politics in Northeast Asia. While Japan and ROK saw reductions from previously rapid increases in oil consumption and import, PRC experienced a rapid growth in dependence on imported crude oil as its basic energy policy shifted from one of conservation and maximization of domestic deposits to one of diversification of suppliers.[2] The shift in Japan and ROK coincided with increasing global awareness of the environmental, social, and commercial issues associated with hydrocarbon consumption, including negative experiences such as the staggering growth of Chinese coal-burning power stations and their associated transborder health and pollution problems, as well as positive ones such as emerging technologies like liquefied natural gas (LNG) and solar panels, which provide the bases for a region-wide energy transition. The culmination of the UN Framework Convention on Climate Change (UNFCCC) COP discussions in Paris 2015 prompted countries to provide roadmaps toward substantial climate change mitigation, with Japan and Korea pledging carbon neutrality by 2050 and China aiming to peak its carbon emissions by 2030.[3] Paris 2015 also marked a geopolitical emergence of a "G2" arrangement in climate change cooperation and policy coordination between the U.S. and the PRC, with distinctively different philosophies driving long-term policy orientations. While President Obama emphasized "mitigation" measures to contain and reverse environmental damages, such as preventative policies, regulations, climate investigation, and the promotion of multilateralism in

[2] Thorarinsson (2018), Calder (2005), Guy et al. (2011).

[3] https://sdg.iisd.org/news/japan-republic-of-korea-pledge-to-go-carbon-neutral-by-2050/; https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/China%20First/China%E2%80%99s%20Achievements,%20New%20Goals%20and%20New%20Measures%20for%20Nationally%20Determined%20Contributions.pdf.

international forums, his Russian and Chinese counterparts have leaned on "adaptation" strategies that attempt to downplay threats and reveal new geographical spaces and economic opportunities in the changing environment. Their viewpoint has translated into building urban and transport infrastructure, investing in new energy technologies, and forging geopolitical alliances to exploit the melting Arctic's Northern Sea Route as a new global trade route linking the East to the West. One could argue that the one-term U.S. President Donald Trump interpreted climate change in terms of a pivotal geopolitical threat, and also as an opportunity, as he offered abundant American shale oil and gas abroad as a means of his politically heightened and securitized foreign policy. As a result, Russia, China, and other countries have become sensitized to the "weaponization" of environmental energy policies, commercial issues such as icebreakers and Liquified Natural Gas (LNG) transportation via the Northern Sea Route (NSR), and the International Maritime Organization's formulation—per Arctic Council's commission—of the NSR's Polar Code for maritime movement along its course.[4]

One might expect that the regional thirst for natural gas, the collective goods of climate change mitigation, clean energy technological advances, the rising importance of LNG relative to pipeline gas, and the overall shift in global economic gravity from the mid-Atlantic to Asia would have led to greater Northeast Asian energy cooperation. Yet for the past two decades, Northeast Asia (NEA) countries have little to show in terms of multilateral cooperation. At the discourse level, the Trilateral Northeast Asia Summit has periodically issued statements on energy cooperation and energy efficiency goals for sustainable growth and co-prosperity since 2011, and addressed nuclear energy security and risks in the aftermath of Fukushima as well as intentions to strengthen cooperation to enhance the efficiency of LNG market in NEA. There is, however, little evidence to date of concrete steps toward joint policy formulation and implementation. The summit in 2018 focused on geopolitical dilemmas and pan-Asian trade arrangement in the aftermath of U.S. withdrawal from the Trans-Pacific Partnership, and the progress report in 2019 made a passing reference to the G20 Ministerial Meeting on Energy Transitions and Global Environment for Sustainable Growth held in Karuizawa in June 2019 and related G20 initiatives.[5] Taking stock of a broad range of government-private sector activities, Choo found limited cases of energy technology cooperation for the enhancement of energy efficiency and environmental cooperation.[6] The UN sponsors the Economic and Social Commission for Asia and the Pacific-Greater Tumen Initiative Seminar on Energy Cooperation, which have focused discussions on subregional power interconnections to help achieve carbon neutrality through trade in renewables. In 2021, it launched a workshop on the North-East Asia Green Power Corridor Roadmap,

[4] As manifested in Secretary of State Mike Pompeo's lambasting of Russia and China at the May 2019 Arctic Council meeting, and criticized Beijing's self-description as a near-Arctic power. https://www.reuters.com/article/us-finland-arctic-council-idUSKCN1SC1AY.

[5] https://www.crisisgroup.org/asia/north-east-asia/trilateral-north-east-asia-summit-signals-return-cooperation; https://www.tcs-asia.org/data/etcData/PUB_1618555301.pdf.

[6] Choo (2016).

which was then picked up by the Asian Development Bank (ADB) and discussed as member states' strategies.[7]

B. Academic and industry perceptions of the potential for cooperation

Political economists have mainly sought to explain why there have not been significant efforts to coordinate energy needs in NEA despite the clear functional benefits of cooperation and managed economic complementarities. Authors in *Northeast Asia: Ripe for Integration?* agreed on several political factors necessary for regionalism to move forward, including: (1) the strength of global institutions such as the World Trade Organization (WTO) and International Monetary Fund (IMF); (2) positivity in the Sino-Japanese relationship; (3) the "balance of interests" between the U.S. and the EU concerning Northeast Asia as their economic and security partner region, with a lack of such intentions likely to lead to an inward-looking East Asian or a China-centered regional hierarchy.[8] Choo points to Russia's unique and powerful position as the dominant regional supplier of oil and gas, which has driven Japan, South Korea and China to cultivate bilateral energy relations.[9] He sees dim prospect for regional cooperation, as "each individual perspective on the issue of cooperation is unilateral (self-centered), bilateral (level of cooperation), omni-directional (all the world energy producers) and multifaceted".[10] The collapse of the Sino-Japanese joint exploration agreement in the East China Sea is a case in point of how a cooperative approach quickly turned into a zero-sum game in which the Japanese commissioned a surveying ship for offshore oil deposits in response to China's alleged drilling of the Chunhao gas fields in the disputed waters.[11] In other words, as long as energy is a "high politics" issue of national security importance, NEA countries' risk management strategies will lead to rivalry and divergence of interests. Implications for unequal economic development as noted above also factor into this zero-sum perception.

In contrast, Carla Freeman (2015) offers a more optimistic view of countries' willingness to act on the advantages of cooperation. She explicitly posits a range of benefits of *openness* through institutionalization, as evidenced in established organizations such as the International Energy Agency (IEA), Gas Exporting Countries Forum, Joint Organisations Data Initiative, Organisation of the Petroleum Exporting Countries, International Partnership for Energy Efficiency Cooperation, and International Renewable Energy Agency. Freeman notes that Asian regional energy forums and nascent institutions already capture some of the benefits, including data sharing, improved communication among consumers and producers, and organizational capabilities to positively socialize members and deliver project financing. ADB-led Central Asia Regional Economic Cooperation program as well as the Greater Mekong

[7] https://www.adb.org/sites/default/files/publication/664331/eawp-030-neasia-power-system-interconnection.pdf; https://www.adb.org/projects/48030-001/main.

[8] Aggarwal and Koo, eds. (2008) p. 259.

[9] Choo (2016) p. 92.

[10] Ibid, p. 103.

[11] Schultheiss (2020, 2021).

Subregion have gone further in facilitating transboundary cooperation around energy delivery.[12] Consistent with the long-standing nature of Asian regionalism, these regional energy institutions do not set binding rules or implement interventionist measures such as price stabilization, emergency energy management and regional stockpiling.[13] Despite the current state of "shallow cooperation," Freeman sees an emerging framework in which Russia, PRC, Japan and South Korea can interact and cooperate in energy security.[14] The framework is shaped by security principles such as energy efficiency and transition to renewables, complementary activities such as emergency response measures and data collection and sharing, and increasing connectedness among the four NEA states via global markets.

Transborder electricity grid is a project that has received a lot of attention and promotion by Asian regional institutions, with analysts pointing to the ASEAN Power Grid project as a valuable reference point for NEA's potential development.[15] For example, Yun and Zhang (2005) discussed how China could supply electricity to Southeast Asian neighbors during disruptions.[16] Their optimistic, economically focused view should be tempered by practical considerations of redistributive implications in China, such as reduced energy supply for electricity consuming Guangdong and Sichuan from electricity producing provinces such as Guangxi and Yunnan. If the grid channels energy production in remote regions to consumer centers—e.g., Mongolia to Seoul—it might create new patterns of uneven and unequal development over time. To the extent that the expanded market dynamics of the grid could improve efficiency of energy transactions, it is likely to benefit China as the supplier over more advanced energy markets such as South Korea, and therefore create contentions over relative gains over time. This consideration could be a key reason that the Japanese government has avoided talking about Softbank's proposed Asian Supergrid, as noted by Mika Ohbayashi of the Renewable Energy Institute (REI).[17]

Nonetheless, industry and international organization analysts have touted the potential benefits of the process of working towards a transborder, multinational grid, including improved communication between states, harmonization of laws and regulations, and the establishment of confidence-building measures such as shared monitoring and data collection, and regular negotiation and expanded participation opportunities.[18] The Association of Southeast Asian Nations (ASEAN) Power Grid project has also fostered a transborder epistemic community, backed by governments'

[12] Freeman (2015) p. 18.

[13] Aggarwal and Lin (2001).

[14] Freeman (2015) p. 20.

[15] Two major UNESCAP reports are: https://repository.unescap.org/bitstream/handle/20.500.12870/1542/ESCAP-2019-FS-Electricity-connectivity-roadmap-Asia-Pacific.pdf?sequence=1&isAllowed=y; https://www.unescap.org/resources/regional-power-grid-connectivity-sustainable-development-north-east-asia. Korneev and Korneev (2019) make a similar case for the Trans-ASEAN Gas Pipeline project.

[16] Yun and Zhang (2005).

[17] Basu (2019).

[18] Ding et al. (2020).

working relations with policy-influential experts and linked forward to global institutions such as the Paris Agreement of UNFCCC and individual countries' commitment to securing a target ratio of primary energy from renewable sources (IRENA).[19]

Choo points out the paradoxes inherent in regionalism in energy. First, energy security could be attained at the cost of motivation for cooperation, such as if the states have reliable access to cheap oil and gas supplies from a stable group of diverse suppliers.[20] Second, national governments gain political currency in talking about cooperation and openness, when actual policies tend to be protectionist of domestic importers and preferential with suppliers. He observes the vehemence that Chinese and Japanese energy officials have shown rhetorically in advocating regional energy cooperation with Southeast Asian countries.[21] In practice, PRC has shunned cooperation with rivals and instead conducted economic statecraft with energy producers such as Australia, Malaysia and Russia.

C. New themes and key insights from a "geoeconomic" perspective

We argue that the mainstream explanations above miss important dimensions of Northeast Asian energy cooperation, especially among Russia, China and Japan, that have driven significant investment, production and trade actions on a project basis and in specific locations of strategic value for regionalism, without triggering formal institutionalization. Consistent with Edward Luttwak's global observation in 1990s that economic measures taken by state and nonstate actors will increasingly become the preferred means of statecraft, we observe that the supplier and consumer relations in the NEA LNG market have generated tangible impact on capital allocation, physical connectivity through transport infrastructure development, and network dynamics that have major effects on regional players' security and commercial interests and their willingness to engage in confidence-building measures and cooperative games under political pressures and market shocks.[22] Chatham House's leading Eurasian energy politics expert, Keun-Wook Paik, has noted that these games have gained greater value in the post-unipolar moment, as the United States and Russia have seen a steady erosion of their influence over political economic outcomes—and arguably lost their self-restraint from disruptive unilateralism—prompting emerging and secondary powers to find new means of risk management to achieve national energy security.[23] Therefore we move beyond the international political economy literature's primary focus on system level analysis of how globalization impacts policymaking and energy decision-making, toward analysis of underlying political and market forces shaping power plays and mechanics of inter-state energy relations.[24] Our empirical story below shows how a geoeconomic process of integration-by-regionalization, via the instrumentalization of collaborative gas pipeline projects

[19] Yun and Zhang (2006).

[20] Choo (2016) p. 95.

[21] Ibid, pp. 100–103.

[22] Luttwak (1990).

[23] Paik (2012).

[24] Blackwill and Harris (2016).

and inter-state LNG networks, may well lead to newer dynamics of energy security and economic order— that may under favourable conditions transcend the barriers to regionalism mentioned above, which are largely legacies of historical animosities, "high" politics and "hard" security arrangements of post-WWII U.S. unipolarity in NEA.

Rising LNG Demand from NEA Economies and National Responses

The most significant market and domestic energy policy trend common to Northeast Asian countries in the first two decades of the twenty-first century is the energy transition through natural gas toward renewables. This trend is consistent with the rising global natural gas demand, which was forecast by IEA (2019) to increase by 1.7 times from 3,505 bcm to 5,986 bcm from 2016–50, of which non-OECD (Organisation for Economic Cooperation and Development) countries will account for 87 percent of the increase.[25] Natural gas consumption is forecast to grow by 2.7 times in Asia from 2016 to 2050, bringing the region's share in the total global consumption from 19 to 29 percent. Given the lack of domestic sources in Japan and South Korea and the underdevelopment of a regional pipeline network, LNG has become the critical medium for the transition. Again, NEA dovetails global trends— IEA (2019) projects that by year 2030, the global demand for LNG will increase to 4.7 trillion cubic meters, and to 5.7 tcm in 2050.[26] Developing economies in Asia have been a powerful engine for this LNG thirst, with their market share of LNG in total gas demand projected to grow from 20% in 2018 to 40% by 2040.[27] For this demand, Asian countries have paid a "premium" which has been sticky since the Fukushima nuclear accident. Between 2010 and 2013, Asian LNG prices for NEA rose from $10–12 per mmbtu (million British thermal units) to $15–18 per mmbtu. Low Henry Hub prices combined with soaring LNG prices in Asia have generated considerable interest among Asian buyers to acquire cheaper gas and explore alternatives to the current pricing structures, which is not market clearing but linked to crude oil import prices.[28] This section briefly surveys these trends and discusses implications for energy cooperation and market governance frameworks in NEA.

A. Japan

Japanese energy security regarding natural gas has been shaped by both domestic demand side management measures, as well as geopolitical opportunities under President Trump's energy policy and foreign economic statecraft. Energy usage in Japan

[25] Itoh (2021).

[26] https://thebarentsobserver.com/en/arctic-lng/2021/03/push-global-lead-lng-moscow-takes-aim-arctic-tundra

[27] IEA (2019).

[28] IEA (2020).

remains highly dependent on fossil fuels, as domestic energy production covered only 12% of total energy supply in 2019.[29] Energy production has decreased (significantly due to the Fukushima disaster 2011) by 32.44% since 1990. This is all whilst electricity consumption has increased 22.03% from 1990.[30] World Economic Outlook (2018) forecasted Japan's natural gas demand to decrease by 0.7 percent per annum from 2017 to 2040 due to the restart of its nuclear reactors and ongoing improvements in energy efficiency and utilization of renewable sources.[31]

Nonetheless, as one of the largest LNG importers, the security of gas supply is a major and long-term concern for Japan. A shortage of gas supply for the power sector in January 2021 resulted in purchases of spot cargos at record high prices—higher than prices after the 2011 Fukushima disaster. Already by 2018, the total cost of Japan's LNG imports had risen to approximately 2.3 times that of 2010.[32] Policy responses have focused on increasing the share of gas imports developed by Japanese companies—what the Ministry of Economy, Trade and Industry (METI) calls the "independent development ratio." METI aims to raise the ratio to 40% for oil and natural gas, and to 60% for coal by 2030.[33] The Japanese government has also encouraged the diversification of LNG supply, launching in 2021 the first LNG transport from Australia.[34] In 2019, over one-third (39%) of imports came from Australia, followed by Malaysia (13%), Qatar (11%), the Russian Federation (8%) and Brunei (6%).[35] Naturally, Russian supply is of intense interest as it would avoid the "Asian premium." Russia has signalled its interest in providing to Japan—in June 2018, Russian Deputy Energy Minister Pavel Sorokin said that Russia might increase its LNG production up to 100 or 120 mt/y by 2035. As U.S. President Donald Trump reached out to Asia from a position of strength in terms of historical domestic energy production and a sharp ideological and security pivot to Asia to stem Chinese threats, Japan has found itself in a delicate political situation. The Japan-U.S. Strategic Partnership was established in November 2017 with the aim of developing new LNG markets globally, but with Biden's reduction of American fossil fuel production, it remains to be seen what potential there might be to address Japan's needs.[36] IEA (2021a, b) notes that "Tokyo's strategy of politicising energy to capture Moscow's attention, thereby improving bilateral relations, if somewhat ignorant of economic rationality, may negatively affect marketing opportunities for

[29] IEA (2021a, b).

[30] https://www.iea.org/countries/japan.

[31] Itoh (2021).

[32] Ibid, p. 26.

[33] IEA (2021a, b) *Japan 2021*, Ibid, p. 30.

[34] https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/electric-power/122320-commodities-2021-japan-to-enter-new-era-of-hydrogen-in-2021-with-launch-of-liquefied-transport.

[35] Ibid, p.161.

[36] Ibid, p. 29.

US LNG suppliers."[37] One could add to this equation Russia's pariah status after the invasion of Ukraine in spring of 2022.

Given the fluctuating geopolitical pressures, Japan has sought stability in domestic regulatory reform approaches to address energy security, market-based instruments such as credit trading, carbon tax and carbon border adjustments to cost-effectively reduce emissions and foster domestic firms' adaptation and innovation.[38] The national goal to achieve carbon-neutrality by 2050 will accelerate the deployment of low-carbon technologies and redress regulatory and institutional barriers.[39] The Green Growth Strategy aims to raise renewables to between 50–60% of electricity demand in 2050, with 10% from hydrogen and ammonia generation.[40] There is a push from the industry and epistemic community for hydrogen energy.[41] As METI talked about a "hydrogen-based society," Japan aims to have 800 000 fuel cell vehicles, more than 5 million residential fuel cells, and to establish an international hydrogen-ammonia supply chain by 2030.[42]

METI has also shown vested interest in the concept of a transregional energy platform. It has advocated the development of "an internationally accepted LNG trading hub" to pull in LNG trade from around the world and to establish a universal price discovery mechanism by increasing spot trading to enhance the reliability of spot price indices, which could result in the elimination of the Asian premium.[43] This platform will be mutually supportive of an open power supply infrastructure by allowing third party access, such as policies to liberalize electricity and gas markets, coordinate firms, and monitor prices, starting at home. Japan established the Organization for Cross-regional Coordination of Transmission Operators in 2015 to "balance electricity supply and demand on a nationwide level and to improve power interchange across regions."[44] It set up the Electricity and Gas Market Surveillance Commission (EGC) in 2016 to monitor the market and promote competition.

Japan has also put up resources for basic research in support of energy transition and efficiency goals. Public investment is high for international standards, with the government energy Research & Development (R&D) spending reaching 314 billion

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[37] Ibid, p. 30.

[38] https://www.iea.org/countries/japan.

[39] IEA (2021a, b).

[40] Ibid, p. 14.

[41] A leading energy expert, Nobuo Tanaka of Tanaka Global, has made a strong case for it to in numerous public forums. https://plus.iru-miru.com/en/article/38916; http://worldfuturefuelsummit.in/downloads/PPT/PS-5/Nobuo_TANAKA_Hydrogen.pdf; https://www.asia-hydrogen-summit.com/speakers/nobuo-tanaka/.

[42] Ibid p. 14; METI (2017), Basic Hydrogen Strategy, METI, Tokyo, www.meti.go.jp/english/press/2017/pdf/1226_003b.pdf, p. 5. The athletes' village for the Tokyo Summer Olympic 2021 was the world's first hydrogen-powered town. https://www.ammoniaenergy.org/articles/japans-road-map-for-fuel-ammonia/; https://www.world-energy.org/article/19439.html.

[43] METI (2016) Strategy for LNG Market Development: Creating Flexible LNG Market and Developing an LNG Trading Hub in Japan, METI, Tokyo, www.meti.go.jp/english/press/2016/pdf/0502_01b.pdf, p. 6.

[44] IEA (2021a, b) *Japan 2021*, IEA, Paris, https://www.iea.org/reports/japan-2021, p. 29.

yen (USD 2.88 billion) in 2018.[45] In 2021, Japan announced plans to mobilize 30 trillion yen (USD 275 billion) of public and private investment for R&D on the environment and energy in the next decade.[46] However, with any push in public policy, the Japanese government faces criticisms of the displacement of private efforts and stunting market development, leading METI to reiterate a "private first" approach.[47]

B. South Korea

As with Japan, oil constitutes the largest energy source for ROK, making up 39% of Total Primary Energy Supply (TPES) in 2018 and 52% of Total Final Consumption (TFC) in 2018, with coal as the second-largest energy source in TPES, accounting for 29% in 2018.[48] Natural gas demand has grown in recent decades, accounting for 17% of TPES in 2018.[49] Even more reliant on imported fossil fuel, Korean domestic production covered only around 1% of total demand, creating an intense sense of insecurity.[50] The ROK government continues to work out its vision for a sustainable energy transition, with demand management goals to improve energy intensity by 38% over the 2017 level and reduce energy demand by 18.6% compared by 2040.[51] The Green New Deal of 2020 talked of building smart grids and promoting green vehicles such as hydrogen and electric, with goals to distribute 200,000 hydrogen passenger cars, buses and trucks, install 450 refuelling stations, and expand hydrogen distribution infrastructure such as production facilities.[52]

As with Japan, Korea has no significant inter-country electricity and gas connections. The ROK government has expressed a "commitment to the creation of a North East Asia Super Grid, to enhance not only energy security, but also the competitiveness of Korea's domestic renewable energy industry."[53] As with its Japanese counterpart, it offers domestic regulatory incentives while pursuing diversification of imports. In April 2019, ROK lowered the tax burden on LNG, while raising it on bituminous coal.[54] In 2018, Qatar accounted for 32% of total imports, followed by Australia (18%), the United States (11%), Oman (10%), Malaysia (8%), Indonesia (8%) and the Russian Federation (4%).[55] ROK became the largest importer of U.S. LNG in 2018, and the state-owned Korea Gas Corporation (KOGAS) signed an agreement with BP in 2019 to buy 1.58 million tonnes (mt) of U.S. LNG for 15 years

[45] Ibid, p. 111.

[46] Ibid.

[47] METI (2016) Strategy for LNG Market Development: Creating Flexible LNG Market and Developing an LNG Trading Hub in Japan, METI, Tokyo, www.meti.go.jp/english/press/2016/pdf/0502_01b.pdf, p. 9.

[48] IEA (2020) Korea 2020, IEA, Paris, https://www.iea.org/reports/korea-2020, p. 17.

[49] Ibid, p. 18.

[50] Ibid, p. 20.

[51] Ibid, p. 22.

[52] Ibid, p. 26.

[53] IEA (2020) "Korea 2020 Energy Policy Review," p. 2.

[54] Ibid, p. 126.

[55] Ibid, p. 142.

starting in 2025. KOGAS purchases most of its LNG through long-term supply contracts and uses spot cargos to correct small market imbalances.[56] Currently KOGAS operates five major LNG terminals, and South Korea also has reloading capabilities to re-export LNG at the POSCO and K-Power jointly owned Gwangyang regasification facility and terminal.[57] Due to KOGAS's monopoly on gas supply and high LNG resale prices at home, private firms are incentivized to invest in regasification capacity and purchase LNG on the global market.[58]

Regionally, ROK has discussed cooperation with China and Japan to improve the transparency and flexibility of the global LNG market.[59] However, as noted, the regional forums have not led to concrete collaborative actions. Technical solutions such as the digitalization of the energy supply chain and the overall energy system have been proposed, but it is not clear how they could reduce national energy security and address emerging threats.[60] More directly impactful are early efforts at cross-border interconnections, with KOGAS and Russian Gazprom signing a Memorandum of Understanding (MoU) in 2008 to investigate the construction of a 1200 km pipeline via the Democratic People's Republic of Korea (DPRK) to supply Russian gas to South Korea. This effort was suspended in 2013 but renewed in 2018, and the two state-controlled firms are currently conducting a joint study on the possibility of a pipeline project.[61]

C. China

Electricity generation in China is still largely provided by coal-burning at 66% of electricity produced in 2018, followed by hydropower (17%), wind (4%), nuclear (4%), natural gas (3%), and solar (2.5%).[62] While renewable sources have garnered massive investments and high hopes for China's energy transition, various political-institutional factors have greatly curtailed the renewable energy usage in the domestic grid, leaving natural gas in its critical role as a transition fuel.[63] PRC's demand for natural gas is projected to expand by 2.8 times from 2016 to 2040, when China will account for approximately 20 percent of the global gas consumption.[64] It is also projected to account for one-third of the total growth in the global LNG trade from 2018 to 2024, overtaking Japan as the largest LNG importer at 109 bcm (or about 80 mt) by 2024.[65] To this end, China has begun to develop LNG transportation infrastructure at home, with nearly 30,000 LNG fuelled trucks and 25 mill tonnes

[56] Ibid.

[57] https://www.iea.org/articles/korea-natural-gas-security-policy.

[58] Ibid.

[59] Ibid, p. 27.

[60] Ibid, p. 30.

[61] Ibid, p. 148.

[62] IEA (2021a, b) *The Role of China's ETS in Power Sector Decarbonisation*, IEA, Paris, https://www.iea.org/reports/the-role-of-chinas-ets-in-power-sector-decarbonisation, p. 25.

[63] Lin and Purra (2019), https://ideas.repec.org/a/eee/enepol/v124y2019icp401-410.html.

[64] IEA (2021a, b) *The Role of China's ETS in Power Sector Decarbonisation*, p. 25.

[65] Ibid, p. 22.

of small-scale LNG delivered (accounting for 50% of China's LNG demand) in 2018.[66] As a result of the ongoing Sino-American trade war, U.S. supplies of LNG to China was cancelled. Australian gas and coal export to China has met with a similar political fate. Consequently, Russia should be moving up from its status as China's third largest gas supplier in 2021.[67] With a predicted shortfall of 270 bcm by 2030, China is likely to turn up the delivery from Russia's Power of Siberia (PoS) pipeline project and the "D" line from Turkmenistan into western China. Further gas supply is already manifesting itself in the form of Novatek LNG's Yamal and ALNG2 projects, and in the later 2020s, Novatek ALNG's 1 and 3.[68] All these LNG projects include Chinese financing, equity participation (upstream and midstream), and/or with Belt and Road Initiative (BRI) involvement—or all three! In the foreseeable future, China will likely overtake Japan as the world's biggest consumer of LNG, and become entrenched in Russian LNG supplies. Hence it will gain price setting leverage in negotiations with LNG suppliers including Australia, Russia, Qatar, and the U.S. If the PRC were to take a lead in forming a NEA LNG market/hub, it would likely have a major say in its pricing and trading parameters.

Lastly, and applied generally to NEA countries, recent transport infrastructure developments, notably the rapid ascendency of Northeast Asian countries as global shipping powers, the intensification of intra-Asian shipping networks centered increasingly on Chinese ports, and the historic expansion of the Panama Canal in 2017 which enables large LNG ships to pass expediently from North America to Asia, have created major and complex effects on energy markets and politics in Asia.[69] Under Trump's presidency, Japan, ROK and Taiwan increased their purchase of American LNG, whereas China dropped its interest in the face of escalating trade war and security conflicts.

A Future Sub-Regional Monopoly in Gas Supply in the Making?

In international relations theories, a hegemon could push for regime-building that provides common goods and system stability. Historically, as Eurasia's largest fossil fuel producer and holder of deposits, Russia has conducted a set of balancing acts to translate its supplier status to geopolitical advantages, which remained largely un-institutionalized by design. Instead, Russia and its consumer partners have been relying on the inherent nature of energy infrastructure such as pipelines and terminals

[66] IEA (2019) *World Energy Outlook 2019*, IEA, Paris, https://www.iea.org/reports/world-energy-outlook-2019, p. 206.

[67] https://www.energypolicy.columbia.edu/research/qa/qa-china-russia-energy-relations-will-new-oil-and-natural-gas-deals-help-russia-weather-economic.

[68] Reilly (2021).

[69] Lin (2019).

to underpin bilateral geoeconomic relations, as these projects and contracts are long-term in financial, economic and political impact, and the number of government and private players are few and often locked into long-term relations.[70] Given the lack of institutionalization in NEA cooperation across a range of issues, Russia's strategy as a politics-first oil exporter would seem to reinforce this tendency for a lack of cross-border coordinated government-market relations beyond those captured in bilateral economic strategic agreements. However, this expectation should not be a given, for there are fundamental technological, developmental, and environmental trends that could create a firmer basis for mutual confidence and perceived necessity in multilateral cooperation. Alternatively, disruptive technologies such as blue/green hydrogen and market swings could pre-empt extant political resistance to a regional approach to energy security.

Predictions prior to 2022 had Russia accounting for 12 percent of the gas production growth in the world from 2017–40.[71] It holds technically recoverable natural gas reserves of 49.3 trillion cubic meters—20% of the world's total—of which a significant portion is under the ice and water of the Russian Arctic.[72] What Russia could hope to gain economically from this resource base is highly dependent on preconditions for infrastructure development, financial provisions, and governing institutions.[73] Russia has stable strategic goals on structural diversification towards LNG and non-carbon exports, digital transformation and institutionalization of energy industries, more equitable spatial distribution of energy infrastructure with a prioritization of Eastern Siberia, Far East and Arctic regions, and promotion of low-carbon development due to climate change.[74] At the same time, Russia is highly dependent on external finance, multinational corporations' technologies in exploration and production, and environmental risk management, as well as sustained European and Asian demand to realize its geopolitical leverage. In the early 2000s during the height of global stature of BRICS and the nadir of Western liberal regime-building, signalled by the impasse over the Doha Round of WTO negotiation, Russia had sought energy cooperation with fellow BRICS members. However, a general decline of the developmental fortunes of non-Chinese BRICS countries and self-inflicted geopolitical shocks in 2014 and 2022 have severely reduced options for Russia, leading to greater reliance on NEA countries' cooperation—in particular on China as the primary energy consumer, provider of finance and technology, and reliable security partner.[75]

However, most recently in 2023, Russia has invited countries such as Turkey, Saudi Arabia, and India to consider equity investment and/or project participation in Russia's flagship LNG operation on the Yamal Peninsula, Novatek LNG, to replace

[70] Nordstream is a classic example. Reilly (2021) p. 49.

[71] IEA (2021a, b) *Japan 2021*, IEA, Paris, https://www.iea.org/reports/japan-2021, p. 21.

[72] Ibid p. 47.

[73] Reilly (2021).

[74] https://eng.brics-russia2020.ru/images/114/89/1148985.pdf, p. 38.

[75] Henderson and Moe (2019).

the Western consortia which have largely withdrawn under the US and EU sanctions.[76] This move's timing is in broad alignment with growing Sino-Russian discussions about the possible expansion of the BRICS membership, to include states such as Saudia Arabia, Iran, Turkey, Algeria and Argentina, and possibly later additional (gas-rich) countries like Kazakhstan, Nigeria and Egypt.[77] This may reflect early signs of the formation of a BRICS-backed, gas-equivalent of OPEC, centered around the NEA gas and LNG markets.

Nonetheless, at this stage Novatek's emphasis is very much on developing major new LNG markets, for instance in India. But crucially, China still remains in the Novatek Consortia, is now agreeing to the development of the Power of Siberia 3 project (via Mongolia), and is building three of the turbines for Arctic LNG2, thus showing no sign of withdrawing from this Novatek flagship venture with Russia in the Arctic.[78] It is reasonable to suggest that Beijing may be positioning itself as both the dominant consumer and a significant partner to Russia in supplying an augmented LNG trading hub in NEA served by emerging gas upstream and midstream consortiums. In this advantageous position, China could capture benefits from the extended LNG global value chain, at the same time bolster its energy security needs.[79]

A. Long-term Russian interest in a preeminent regional supplier status

Russian President Putin's "pivot" to Asia statements in 2014 coincided with Moscow's decision that the Arctic would be the critical region for economic development/investment in the twenty-first century.[80] The key vehicle for monetizing an Arctic economy was the development of Novatek LNG's operation on the Arctic's Yamal Peninsula. It was imagined that this vehicle would attract Western technology, management know-how, proprietary knowledge (LNG systems and licences), and international investors and customers alike. It also furthered Putin's Arctic decree by maximizing the economic use of the Eurasia-spanning NSR, to channel LNG to clients in both Europe and Asia. For Russia, the strategic significance of the Arctic LNG gameplay is threefold: (1) geoeconomic leverage over NEA's power-generation capacity; (2) the use of the NSR as a major new maritime sea lines of communication to anchor Putin's Greater Eurasian Partnership vision, and concomitantly making credible the emergence of Russia as a Sea Power in NEA; and (3) the establishment of a new, digitally connected, regional LNG trading hub in NEA that Russia could substantially supply at a super-competitive price, and thereby reduce

[76] https://www.rivieramm.com/news-content-hub/news-content-hub/total-withdraws-directors-to-novatek-writes-down-us37bn-74240.

[77] https://www.silkroadbriefing.com/news/2022/11/09/the-new-candidate-countries-for-brics-expansion/.

[78] https://www.nasdaq.com/articles/russias-arctic-lng-2-will-use-chinese-equipment-for-power-generation-novatek.

[79] Zeng et al. (2022); China's strengthened—even in relative terms-market position could adversely affect Japan's: https://asia.nikkei.com/Business/Energy/China-tightens-grip-as-dominant-LNG-buyer-with-long-term-deals.

[80] Henderson and Moe (2019).

US/Western LNG industry competition and its potential geoeconomic influence in and over NEA.[81] It is not coincidental that these three factors coincide with China's energy and security interests, from both a geoeconomic and strategic point of view.

In this scheme of regional energy dominance, Moscow bets both on pipelines and maritime LNG transport routes. Given China's increasing number of pipeline deals with Central Asian countries, as well as the long-term cost implications of pipeline projects—notably the $400 billion gas deal signed in 2014, which has locked in Beijing to pay prices well above market prices in recent years—and potential inadequacy of Western Siberian deposits, both Russia and China have incentives to develop Russian LNG resources and routes.[82] The significance of pipeline delivery in bilateral geopolitical calculus became salient once more when, two weeks before the launch of Russian invasion of Ukraine in February 2022, Putin signed a new 30-year contract for Gazprom to supply gas to China National Petroleum Corp. (CNPC) via a new pipeline in the Russian Far East.[83]

In contrast to pipelines, LNG is evidently the market instrument for geoeconomic strategies. Given its technological and transport capacity for flexible delivery destination and multi-sourcing potentials, as well as the more discrete stages of the global LNG value-chain, the LNG industry provides far greater opportunities for transnational cooperation for government and private actors.[84] Even in the midst of Western sanctions of post-Crimea Russia, Novatek's LNG's Arctic projects continued to forge investment and production partnerships with French, Chinese, Japanese and Indian energy firms, and have been instrumental in these stakeholders' imagining of a potential regional, cooperative energy trading hub.[85] Right off the bat, China underwrote the projects' first output—Yamal LNG—by taking a direct equity-based position and offering financial support in face of financial sanctions imposed on the project by the West since 2014. Joining Gazprom and Rosneft in the two Sakhalin gas projects, Novatek further develops its relationship with Japanese, Chinese and European partners drawing together geographical resources of the Northern Sea Route, Russian Far East, and Russian Arctic.[86] Prior to the Russo-Ukraine war in 2022, Northeast Asia's burgeoning LNG market had been pursued by the biggest global suppliers—U.S., Australia, Qatar, and Russia—with the latter exerting a geographical

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[81] Razmanova (2020).

[82] https://www.washingtonpost.com/world/europe/china-russia-sign-400-billion-gas-deal/2014/05/21/364e9e74-e0de-11e3-8dcc-d6b7fede081a_story.html.

[83] Notably, with the deal settled in euros. https://www.reuters.com/world/asia-pacific/exclusive-russia-china-agree-30-year-gas-deal-using-new-pipeline-source-2022-02-04/.

[84] The LNG value chain encompasses production, processing, and conversion of.
natural gas to LNG, its long-distance transportation, and regasification. https://www.energy.gov/sites/default/files/2020/10/f79/LNG%20Value%20Chain%20Fact%20Sheet_1.pdf.

[85] Henderson and Yermakov (2019). Also see, https://www.highnorthnews.com/en/novatek-ships-yamal-lng-japan-uncertain-if-delivery-was-made-arctic; https://phys.org/news/2019-09-russia-novatek-huge-arctic-gas.html; https://jpt.spe.org/russian-lng-aims-high-leveraging-big-reserves-and-logistical-advantages.

[86] https://www.reuters.com/article/russia-rosneft-lng-idUKL5N25W2OI; https://www.novatek.ru/en/press/releases/index.php?id_4=4503.

advantage in promoting a *regional* energy approach with the Asian consumers—i.e. "regionalization-by-gasification". It had seemed like critical pieces were falling in place for a LNG-centered framework for regional integration in energy market and policies, led by quasi-private actors backed by geoeconomic statecraft.[87]

B. Chinese and Japanese stakes in private sector Russian gas projects

Established in 1994 and led by Putin's close ally, Leonid Mikhelson, Novatek serves as a new vehicle for regional gas supplies and scarce private sector partnerships. It holds a 50.1% stake in Yamal LNG; while France's Total holds 20%, China's CNPC holds 20% and PRC's Silk Road Fund 9.9%.[88] Starting in 2020, Novatek has shipped LNG from the Yamal project to Japan eastbound via the Northern Sea Route.[89] The success of the first Yamal project led to plans for developing a second LNG terminal planned to commence 2023—a 19.8 million mt/year, Arctic LNG 2 project—with Chinese and Japanese shareholders. Novatek has a 60% stake in Arctic LNG 2.[90] Chinese national oil companies CNPC and China National Offshore Oil Corp. each holds a 10% stake.[91] A consortium (Japan Arctic LNG) of Mitsui and the government-owned Japan Oil, Gas and Metals National Corporation holds a 10% stake in the Arctic LNG 2 project.[92] Close to home, Japanese firms have invested in the Sakhalin gas fields in the RFE. Mitsui and Mitsubishi hold 12.5% and 10% stakes respectively in the Sakhalin-2 gas project. By 2022, 60% of LNG output from Sakhalin-2 had gone to Japan, constituting around 10% of Japan's total LNG import.[93] Under pressure from Western firms' exit after Russia's invasion of Ukraine in 2022, Japanese Prime Minister Kishida has reiterated his government's commitment to Sakhalin-2.[94] The estimated cost of replacing Sakhalin gas with spot market supplies would be $15 billion, which would raise the cost of Japanese import of LNG by one-third per year.[95]

There are further plans to develop a conventional onshore gas field located on the Gydan Peninsula within the Arctic Circle, in the north of the Russian Federation, and

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[87] See Reilly (2021) on "polycentric regionalism".

[88] https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/072420-russias-novatek-ships-first-lng-cargo-to-japan-eastbound-via-northern-sea-route.

[89] https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/072420-russias-novatek-ships-first-lng-cargo-to-japan-eastbound-via-northern-sea-route.

[90] Ibid.

[91] https://seanews.ru/en/2019/08/01/en-mitsubishi-not-investing-in-arctic-lng-2/.

[92] http://www.gasprocessingnews.com/news/mitsui,-jogmec-to-invest-in-novateks-arctic-lng-2-project.aspx.

[93] https://asia.nikkei.com/Business/Energy/No-easy-exit-for-Japan-from-Russia-S-Sakhalin-2-LNG-project. If the Japanese firms had exited following Shell, there would've been no guarantee that Japan would continue to receive any LNG from Sakhalin.

[94] https://www.reuters.com/world/asia-pacific/japan-will-not-abandon-sakhalin-2-lng-stake-kishida-says-2022-03-31/; https://asia.nikkei.com/Business/Energy/Japan-backed-Sakhalin-2-LNG-project-rocked-by-Shell-exit.

[95] https://asia.nikkei.com/Business/Energy/Replacing-Russian-LNG-from-Sakhalin-2-would-cost-Japan-15bn.

to construct natural gas and liquefaction facilities.[96] Beyond LNG, Novatek has also been in talks with Mitsui over an ammonia project in the Arctic, expected to start 2026, which would convert renewable electricity into an energy-rich gas that can easily be cooled and stored in a liquid fuel cells to power vehicles.[97] Consistent with this possibility, Mitsui O.S.K. Lines re-entered the ammonia transport space with the charter of the ammonia and LNG carrier *Green Pioneer*.[98] South Korea, which has been absent in these energy investment projects, is expected to capitalize on this new energy source development. Shipbuilding & Offshore Engineering (KSOE) will develop ammonia-fuelled ships for certification by Korean Register (KR), while Lotte Global Logistics and Hyundai Merchant Marine will operate those ships.[99] Japanese and South Korean shipbuilding (LNG vessels and icebreakers) represents midstream investment in Novatek's LNG operation by its regional customers, further fleshing out these players' niches and commitments to a regional LNG value chain.

In sum, the above commercial tie-ups have robust and enduring values in national energy security terms.[100] Tim Reilly has demonstrated that "the forming up of an LNG networked institutional structure (equity holders, operators, service providers and financing instruments such as the Silk Road Fund) under the banner of the Novatek partnership, constitutes a fledgling *institutional component* of industrial P-R in NEA."[101] As Russia's leading private energy firm, Novatek receives subsidies from the Russian government and benefits from industrial policies for domestic manufacturing, including tax incentives and promotion of commercial technologies at home and abroad.[102]

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[96] Ibid.

[97] https://www.reuters.com/business/energy/russias-novatek-talks-with-japans-mitsui-ammonia-project-kommersant-says-2021-06-24/; https://lngprime.com/other-fuels/novatek-in-ammonia-talks-with-mitsui/23292/.

[98] https://www.mol.co.jp/en/pr/2021/21042.html.

[99] https://www.ammoniaenergy.org/articles/the-ammonia-wrap-two-new-large-scale-ammonia-projects-in-the-uae-and-more/.

[100] Quoting Mitsui, "abundant natural gas reserves and geographical superiority in terms of access to major LNG demand areas, we will contribute to the stable supply of energy to the world, including Japan." https://www.mitsui.com/jp/en/release/2019/1229585_11219.html.

[101] Reilly (2021), p. 22.

[102] Tim Reilly, "A Sino-Russian LNG Venture in the Eurasian Arctic," p. 13.

Conclusion: Turning Geoeconomics on Its Head? Implications of Russia's Invasion of Ukraine 2022

The short- to medium-term effect of Western economic pressures on Russia is to drive Russia further into Beijing's arms.[103] President Putin's visit of Beijing in December 2021 and the range of agreements signed on energy, food, and finance reflected a mutual effort to consolidate the geoeconomic relationship to brace for the onslaught of Western responses to the Russian invasion of Ukraine. The Chinese Coast Guard—Russian Federal Security Service Memorandum of Understanding, signed in Murmansk in May 2023, is directly linked to the sovereignty and enforcement of Russia's Northern Sea Route (NSR). This move has significant implications as this new global Sea Line of Communication (SLOC), links northern Eurasia from the Barents Sea in Europe to the Bering Strait in NE Asia, and facilitates the movement of Russian Arctic LNG to markets spanning Eurasia. In spite of sanctions, Arctic projects like Novatek LNG are increasingly competitive on pricing, volumes, and availability/access, benefitting China (and other countries such as India) in terms of the security of energy supply. This Sino-Russian MoU is also significant as a precursor to Russia and China becoming regional blue-water maritime powers in the NSR's Eurasian Arctic.

In the short-term, Japan and ROK would be restrained from accepting Russian energy.[104] What remains unclear is whether Russia's increased isolation and energy cooperation with China will reduce or increase the need for regional cooperation in NEA. In other words, would Russia's closer peg to China's oil and gas demands reduce or increase the momentum for the formation of a regional energy market? Might Russia's cooperation with China fuel competitive dynamics among neighboring countries?[105] By exacerbating South Korea's and Japan's energy security concerns, might Russia incentivize these countries to focus on bilateral relations and extra-regional energy relations (with U.S., Australia, Southeast Asia, the Middle East, etc.), instead of regional cooperation in NEA? Is Russian's long-term geostrategy to strike a strategic balance between European and Asian demands for its oil and gas in Eurasia, and between China and Japanese and Korean demands in the regional sense, effectively defunct for the foreseeable future? What other energy relations, such as with India and Central Asian countries, might Moscow put in place to adapt to a gloomy outlook of worsening asymmetry vis-à-vis Beijing?

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[103] https://www.csis.org/analysis/can-russia-execute-gas-pivot-asia; https://www.rivieramm.com/news-content-hub/news-content-hub/exxonmobil-leaving-russia-sakhalin-1-70040.

[104] https://www.bloomberg.com/news/videos/2022-03-28/japan-ahead-tanaka-global-ceo-nobuo-tanaka-video.

[105] Japan is concerned that Chinese takeover of Shell shares after the latter's exit amidst sanctions on Russia in 2022 would increase the chance of a Sino-Russian consensus to downgrade provisions for Japan. https://theprint.in/world/japan-concerned-over-china-russia-lng-alliance-after-shell-exits-sakhalin-2/928008/; https://www.offshore-technology.com/news/chinese-shells-russian-gas/.

In the second half of 2022 and first half of 2023, the PRC appears to be leveraging two geopolitical factors to diversify its oil relations with Middle East producers—first, the Biden Administration's uneasy relations with the Saudi Crown Prince Mohammed bin Salman. This is suggested in the recent announcement of Saudi Aramco building a major refining complex in NE China and further investing in a multi-billion joint venture petrochemical facility.[106] The second leverage for China is the impasse in bilateral and multilateral negotiations over nuclear agreements and changes in sanctions on Iran.[107] The culmination of Beijing's opportunism was the Chinese brokered meetings between Iran and Saudi Arabia in early 2023, which stoked discussions by Arab producers on trading LNG in the Chinese currency (RMB).[108] While these transactions are far from projecting a rosy future for RMB internationalization, they clearly indicate the tightening relations between Russia, the Middle East and Iran, and China as mutually beneficial responses to geopolitical pressures applied by the US. These unfolding effects should be examined as a *geoeconomic* consequence of the Biden Administration's clear prioritization of the Indo-Pacific and European theatres, and not as unrelated or inevitable trade-off of America's ongoing conflicts with Russia, Iran and China. The Chinese Coast Guard—FSB MoU, however, is the first unambiguous sign of the intensification of Sino-Russian energy-related relations leading to a bilateral regional governance framework, despite and perhaps even because of the East–West nature of events in Ukraine.

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[106] https://www.reuters.com/business/energy/saudi-aramco-open-new-china-refinery-petchem-complex-2026-2023-03-26/.

[107] https://www.bloomberg.com/news/newsletters/2023-04-22/china-is-slowly-moving-into-the-middle-east-new-economy-saturday.

[108] https://www.energyintel.com/00000186-3aad-d94d-a19e-bbedc2700004; https://www.al-monitor.com/originals/2023/03/china-settles-first-lng-trade-yuan-uae-deal.

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