



**The Asia Foundation**

*2020 Northeast Asia Policy Dialogue Forum*

**Northeast Asian Perspectives on Sustainable Infrastructure  
Cooperation in the Era of COVID-19:  
Managing National and Regional Objectives  
in China, Japan, Korea, and Mongolia**

Forum Discussion Report

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Working Paper

May 2021

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## INTRODUCTION

The crises of global climate change and the COVID-19<sup>1</sup> pandemic, combined with their material impacts on human health and prosperity, have introduced a tremendous urgency to the sustainable development agenda. Sustainable development is no longer an idealistic vision, but it is, instead, a crucial schema for the survival of lives and economies. A major factor in global climate change is energy and transport infrastructure, which generates more than 70 percent of global greenhouse gas emissions (GHG).<sup>2</sup> These two sectors also account for approximately two thirds of the projected US\$94 trillion worth of infrastructure needed between 2016 and 2040, according to the Global Infrastructure Hub's *Global Infrastructure Outlook*.

Alongside the United States and India, the People's Republic of China and Japan have the greatest infrastructure needs; China accounts for 30 percent of the global total needs, and other Asian countries account for more than 20 percent.<sup>3</sup> Additionally, of seven Northeast Asian (NEA) locations – China, the Democratic People's Republic of Korea (DPRK), Japan, Mongolia, the Republic of Korea [ROK], Russia, and Taiwan – three account for more than 30 percent of total global GHG emissions: China, Japan, and the ROK ranked 1<sup>st</sup>, 5<sup>th</sup>, and 9<sup>th</sup>, respectively, in 2019.<sup>4</sup>

China and Japan are also among the top public sector infrastructure investors in the world. Japan provided 43 percent of all official development assistance (ODA) over the past four decades for economic infrastructure (transport and storage, communications, energy, financial services).<sup>5</sup> ODA data from China is not readily available, but estimations suggest that the country has caught up to and perhaps overtaken Japan's ODA in recent years. From 2000 to 2014, China and Japan provided ODA in the amount of \$354 billion and \$305 billion, respectively, the majority of which was allocated to economic infrastructure.<sup>6</sup> The ROK has also become an active infrastructure finance provider.<sup>7</sup> China, Japan, and the ROK actively seek to export their mature infrastructure capacities globally and regionally. The three countries compete for projects in

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<sup>1</sup> [UN presentation](#) during a recent event titled, "COVID-19 and its link with biodiversity losing its homes in the forest and the advent of the COVID-19." on May 22, 2020, the International Day for Biological Diversity.

<sup>2</sup> Ritchie, H., "Sector by sector: where do global greenhouse gas emissions come from?", *Our World in Data* [website], 18 September 2020, <https://ourworldindata.org/ghg-emissions-by-sector>, accessed 10 January 2021.

<sup>3</sup> Global Infrastructure Hub, *Global Infrastructure Outlook* [website], 2017, <https://outlook.gihub.org/>, accessed 10 January 2021.

<sup>4</sup> Global Carbon Project, "Global Carbon Atlas Country Emissions Update 2019," *Global Carbon Project* [website], <http://www.globalcarbonatlas.org/en/CO2-emissions>, accessed 10 January 2021.

<sup>5</sup> Solis, M., "China, Japan and the Art of Economic Statecraft," *Brookings Institution* [website], February 2020, [https://www.brookings.edu/wp-content/uploads/2020/02/FP\\_202002\\_china\\_japan\\_solis.pdf](https://www.brookings.edu/wp-content/uploads/2020/02/FP_202002_china_japan_solis.pdf), accessed 10 January 2021.

<sup>6</sup> Solis, M., "China, Japan and the Art of Economic Statecraft," *Brookings Institution* [website], February 2020, [https://www.brookings.edu/wp-content/uploads/2020/02/FP\\_202002\\_china\\_japan\\_solis.pdf](https://www.brookings.edu/wp-content/uploads/2020/02/FP_202002_china_japan_solis.pdf), accessed 10 January 2021.

<sup>7</sup> Scavone, A., "Global Infrastructure: South Korea's Vision," *White & Case* [website], 18 January 2016, <https://www.whitecase.com/publications/insight/global-infrastructure-south-koreas-vision>, accessed 10 January 2021.

countries that have large infrastructure needs and relatively less-developed financing and construction capacity, such as Indonesia, Malaysia, and the Philippines.<sup>8</sup>

NEA countries also engage in infrastructure cooperation and explore regional development opportunities. In 2018, the ROK President Moon Jae-in announced a New Northern Policy (NNP) that aims to enhance ROK transborder connectivity to the Eurasian continent via, for example, a railway system that connects the ROK with the DPRK, China, Mongolia, and Russia.<sup>9</sup> In order to reach new infrastructure cooperation goals, the ROK is looking to resume an older intergovernmental cooperation model, the Greater Tumen Initiative (GTI).<sup>10</sup> The GTI launched in 1995 to foster greater growth and sustainable development in the NEA region, but geopolitical dynamics, including the DPRK's withdrawal in 2009, limited the initiative's progress.<sup>11</sup> The ROK has also indicated an interest in linking to China's Belt and Road Initiative (BRI). Mongolia cooperates bilaterally with China, Japan, and the ROK on infrastructure, mainly in the form of investment and technical support from these three infrastructurally-advanced countries. Additionally, despite competing global infrastructure visions – China's BRI and Japan's Quality Infrastructure Partnership – China and Japan already collaborate on infrastructure projects outside the NEA region, albeit more opportunistically than strategically.

Given these burgeoning cooperation initiatives, the NEA region's outsized infrastructure needs and its equally outsized contribution to GHG emissions, it is critical to shift NEA countries toward sustainable development in order to safeguard the planet's health and prosperity. Sustainable infrastructure can play an important role in this transition. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP),<sup>12</sup> sustainable infrastructure serves economic, environmental, and social purposes. Economically sustainable infrastructure undergirds innovative and broad-based growth, creates jobs and economic opportunities, and operates cost-effectively with manageable levels of public debt. Such infrastructure mitigates environmental damages and, when possible, generates environmental benefits, including reduced flood risks, enhanced air quality, biodiversity conservation, and cleaner and more efficient energy production. Socially sustainable infrastructure addresses issues such as community development (especially communities affected by infrastructure projects), gender inequality, maternal and infant mortality, and access to water, sanitation, schools, and other critical services.

Against the backdrop of sustainable development infrastructure cooperation, in December 2020, The Korea Development Institute School of Public Policy and Management (KDI School) and The Asia Foundation organized a policy dialogue forum: "Northeast Asian Perspectives on

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<sup>8</sup> Creehan, S., "If You Build It, They Will Lend: Why Japan May Fund More Infrastructure Than China," *Pacific Exchange* [blog], 12 October 2017, <https://www.frbsf.org/banking/asia-program/pacific-exchange-blog/if-you-build-it-they-will-lend-why-japan-may-fund-more-infrastructure-than-china/>, accessed 10 January 2021.

<sup>9</sup> Cronin, P. and Lee, K., "How South Korea's 'New Economic Map' Could Shift Northeast Asia's Balance of Power," *The Diplomat*, 10 August 2018, available at <https://thediplomat.com/2018/08/how-south-koreas-new-economic-map-could-shift-northeast-asias-balance-of-power/>, accessed 10 January 2021.

<sup>10</sup> Republic of Korea, Presidential Committee on Northern Economic Cooperation, 2017, [http://www.bukbang.go.kr/bukbang\\_en/vision\\_policy/strategy/](http://www.bukbang.go.kr/bukbang_en/vision_policy/strategy/), accessed 12 May 2021.

<sup>11</sup> Ko, C. N., "Cooperation for East Asian Railway Community," *The Korea Times*, 3 April 2019, Opinion, available at [http://www.koreatimes.co.kr/www/opinion/2019/04/197\\_266327.html](http://www.koreatimes.co.kr/www/opinion/2019/04/197_266327.html), accessed 10 January 2021.

<sup>12</sup> Sadicon, M.F., "Regional Sustainable Infrastructure Initiatives in Northeast Asia: Developments and Directions," Presentation at the Northeast Asian Perspectives on Sustainable Infrastructure Cooperation in the Era of COVID-19, Seoul, Korea, 2 December 2020.

Sustainable Infrastructure Cooperation in the Era of COVID-19” (the Forum). The Forum convened key experts and opinion leaders from China, Japan, Mongolia, and the ROK to exchange ideas on the latest trends, opportunities, and challenges related to sustainable infrastructure in Northeast Asia. The Forum’s ultimately goal was to build trust among participating countries and engender greater regional cooperation.

Forum discussions centered on four major topics: 1) Reaching Consensus and Managing Trade-offs; 2) COVID-19, Technology, and Building for the Future; 3) Promoting Bankable Projects; and 4) Regional Dynamics and Cooperation. These topics encompassed various important and not insignificant obstacles that impede regional sustainable infrastructure cooperation. For each topic, this report analyzes current trends and suggests policy options to overcome obstacles and seize opportunities for regional and global sustainable infrastructure.

## **REACHING CONSENSUS AND MANAGING TRADE-OFFS**

A key challenge in advancing sustainable infrastructure is the lack of clarity or consensus on what constitutes sustainable infrastructure. Does sustainable infrastructure mean infrastructure that is specifically designed to advance sustainability (e.g., renewable energy, telecommuting technology, remote medical-consultation networks)? Does it also include infrastructure that has been made less unsustainable (e.g., coal-fired power plants retrofitted with carbon capture)? How much economic, environmental, or social damage can infrastructure inflict and still be considered sustainable? Such questions receive varied responses from different stakeholders: Different countries and entities (developers, contractors, investors, etc.) apply different sustainability standards, including, for example, multilateral development bank (MDB) environmental, social, and governance (ESG) standards, Japan’s quality infrastructure standards, and China’s green infrastructure standards and green taxonomies. Dr. Ang Li of the Innovative Green Development Programme (iGDP) explained this gap in understanding during her presentation. She noted, for example, that more Chinese sustainable infrastructure projects can be classified as “green” using China’s Green Bond taxonomy than the European Union’s more stringent Sustainable Finance taxonomy.

Moreover, while there is general consensus that sustainability encompasses social, environmental, and economic dimensions, tensions arise with regard to how to prioritize between these dimensions. Dr. Taidong Zhou of the Center for International Knowledge on Development of the Development Research Center of the State Council (CIKD/DRC) detailed how – as articulated by many United Nations Sustainable Development Goals (SDG) researchers – that there are tradeoffs in the sustainable development agenda; it can pursue triple win (social-environmental-economic) scenarios, but such outcomes are not always possible. A common tension flagged by SDG researchers is between economic (consumption, industrialization, etc.) and environmental (ecosystems, climate change, pollution, etc.) objectives.<sup>13</sup> Prioritizing certain dimensions over others creates challenges for regional sustainable infrastructure cooperation because different countries (and different actors within countries) likely have different sets of

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<sup>13</sup> International Science Council, “A Guide to SDG Interactions: From Science to Implementation,” International Science Council [website], 2017, <https://council.science/publications/a-guide-to-sdg-interactions-from-science-to-implementation/>, accessed 10 January 2021.

priorities. For example, China and its East Asian neighbors (Japan and the ROK) generally consider economic development to be a prerequisite for environmental and social progress [Zhou]. Dr. Eric Zusman of the Institute for Global Environmental Strategies (IGES) explained, however, that all economic development cannot be considered sustainable. He gave the example that many COVID-19 economic recovery packages, such as those that subsidize the fossil fuel industry, impose environmental costs even as they provide social and economic benefits.

**Policy options drawn from the Forum on how to reach greater consensus on sustainable infrastructure include:**

**1) Sustainable infrastructure standards** warrant further robust exploration. Dialogue and consensus building on ESG standards and green taxonomies provide a readymade opportunity for NEA regional cooperation, particularly in the context of recent ESG advances made by each of the three NEA donor countries (China, Japan, and the ROK). Their new ESG standards are often compared to the World Bank's and other MDB standards. However, given Asia's relatively large infrastructure development footprint and the decline of the World Bank's infrastructure engagement (30 percent of its portfolio in the 2000s compared to 70 percent in the 1960s<sup>14</sup>), NEA countries should gain a deeper understanding of how Asian donor standards compare to one another and to those of MDBs. For example, how do the G20 Principles for Quality Infrastructure Investment adopted in 2019 (informed by Japan's long-standing conception of quality infrastructure) compare to China's increasingly robust Green BRI standards?

MDB standards should not, however, be entirely dismissed. Several Forum participants, including Kentaro Takahashi from IGES, Maria Fideles Sadicon of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), and Hong-Sang Jung from the KDI, noted that it is important to make full use of existing mechanisms to advance the sustainable infrastructure agenda, including multilateral platforms, such as the World Bank's ESG standards and the Asian Development Bank's (ADB) Quality Infrastructure Partnership. At the same time, Dr. Junichi Fujino of IGES suggested that ongoing discussions related to sustainable infrastructure would greatly benefit from more NEA voices. NEA standards for sustainable development are extremely important given the NEA region's outsized share of global infrastructure supply and demand.

**2) Systems-wide planning** that considers social, environmental, and economic tradeoffs increases the effectiveness of ESG standards. Dr. Suzana Sumkhuu from Mongolia's National Development Agency (NDA) highlighted the importance of systems planning for the country's sustainable infrastructure. Mongolia created a five-year plan to meet its Sustainable Development Vision agenda adopted in 2016. The five-year plan included investing in sustainable infrastructure, such as solar, water, and hydropower, and diverging from coal as a major source of energy. The Sustainable Development Vision agenda, which linked to Nationally Determined Contributions (NDCs) and SDGs,

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<sup>14</sup> Pardo, R. and Rana, P., "Co-operation Not Competition: The New Multilateral Development Banks and the Old," *Global Asia* 13(1), June 2018, available at <https://www.globalasia.org/v13no1/feature/co-operation-not-competition-the-new-multilateral-development-banks-and-the-old> ramon-pacheco-pardopradumna-b-rana, accessed 2 March 2021.

exemplified Mongolia's holistic, cross-sectoral approach to sustainable infrastructure. Sumkhuu also noted that Mongolia draws lessons from its more industrialized NEA neighbors for lessons on long-term, holistic infrastructure planning.

Dr. Tae Yong Jung of Yonsei University (YU) and Zhou also noted the economic infrastructure-led and planned-development pathways of China, Japan, and the ROK. The economic success of these three "developmental states" are often exemplified as an alternative to market-led economies. Such economic development may be an additional and unique opportunity for NEA regional cooperation, based on knowledge sharing on how to apply systems planning to manage sustainable infrastructure tradeoffs. However, such NEA country experience-sharing should consider both infrastructure development successes and failures.

## **COVID-19, TECHNOLOGY, AND BUILDING FOR THE FUTURE**

Most recently, the COVID-19 pandemic has prompted countries to reconsider infrastructure plans. The pandemic has risen questions about how infrastructure can withstand and mitigate the impacts of disasters and demands for digital technologies. Digitalization has accelerated greatly due to the demands of COVID-19, which forced a large-scale transition to telecommuting, teleconferencing, remote learning, and automated service delivery. Many countries, including China, Japan, and the ROK, have fast-tracked digital-infrastructure development, including 5G mobile broadband, the Internet of Things, industrial Internet, satellite Internet, blockchain, cloud computing, electric vehicles, green buildings, and smart cities. Xinkai Duan of the China Center for Urban Development and National Development and Reform Commission (CCUD/NDRC), Soo-Jeong Myeong of the Korea Environment Institute (KEI), and Hyung-Ju Kim of the Green Technology Center (GTC) explained how digital infrastructure features heavily in COVID-19 recovery plans in China, Japan, and the ROK. Many of the technological developments seen during the pandemic will likely remain in place and continue to increase post-pandemic. This reliance on digital technologies necessitates a reevaluation of infrastructure needs.

Moreover, COVID-19 exposed a need for more social and inclusive infrastructure. Inequitable access to social and health infrastructure has long been a problem, and COVID-19 exacerbated many situations. As part of its pandemic recovery "new infrastructure" strategy, China will develop infrastructure with social welfare benefits [Zhou; Duan]. The ROK is also dedicated to developing its education and health infrastructure, such as contact tracing and testing centers, in response to COVID-19.

**Given the new infrastructure needs driven by technology and accelerated by the COVID-19 pandemic, there are several opportunities for NEA regional cooperation:**

**1) Sustainable infrastructure pipeline.** 2017 estimates of infrastructure need for Asia from 2016 to 2030 vary from \$1.5 trillion (baseline estimate) to \$1.7 trillion annually



(climate -adjusted estimate).<sup>15</sup> These 2017 figures more than double 2009 estimates, and, in the wake of COVID-19, current estimates project an additional need of several hundred billion dollars per year to make infrastructure resilient to multiple disasters.<sup>16</sup> These staggering figures beg the question of whether estimates may be unrealistic or inflated. Some projected infrastructure pipelines may be outdated and conceived with current or past socio-economic needs and technologies in mind. For example, Asia may no longer require as many new roads, railroads, and airports as previously projected given telecommuting, automated vehicles, ride-sharing, and other smart mobility trends. Additionally, green buildings, smart cities, and other energy demand-reducing developments may reduce power-generation infrastructure needs. These trends suggest a need to revisit post-COVID-19 infrastructure pipelines in the context of a digital economy. Given the systems-planning capabilities and digital-infrastructure orientations of various NEA countries, Asia is well-positioned to undertake this task.

Rather than starting from scratch, governments should review existing infrastructure pipelines (i.e., their catalogues of planned or desired infrastructure projects), such as the Asian Highway Network (AHC), Trans-Asian Railway Network, and the BRI. These infrastructure projects were not initially designed with sustainability in mind, but, according to Sadicon, these initiatives can still be recalibrated toward sustainability in terms of traditional or “gray” (i.e., concrete- or steel-based) infrastructure projects, such as dams, roads, and coal-fired power plants. China, Japan, and the ROK, as major public sector sponsors of current and planned infrastructure pipelines, are well-positioned to make them more sustainable, such as China’s greening of the BRI. According to a survey conducted in the first half of 2020, 58 percent of the BRI’s energy projects are now green; 70 percent of the BRI’s financiers recognized the importance of green finance; and many coal projects have been halted [Zhou].<sup>17</sup> A potential next step to rationalize the BRI, AHC, and other current or planned infrastructure pipelines would be to prioritize projects that catalyze sustainable development.

**2) China, Japan, and the ROK are domestically developing and internationally exporting smart cities.** Japan plans to develop more than 170 net-zero-carbon cities by 2050. A number of these will serve as models for developing countries to reduce carbon emissions, including reductions related to residential, commercial, industrial, and transport infrastructure. The ROK aims to develop 25 good-practices cities to demonstrate the benefits of green and digital infrastructure worldwide [Fujino]. Low- and middle-income countries, like Mongolia, welcome smart city projects [Myeong]. Smart cities are a particularly useful type of infrastructure project because they comprise multiple sustainable-infrastructure innovations, from Internet connectivity to public transportation and green buildings. Smart-city development helps countries acquire a wide range of sustainable-infrastructure technologies and city-scale systems-

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<sup>15</sup> Asian Development Bank, “Meeting Asia’s Infrastructure Needs,” ADB [website], 2017, <https://www.adb.org/publications/asia-infrastructure-needs>, accessed 4 March 2021.

<sup>16</sup> United Nations ESCAP, “COVID-19 reveals urgent need for resilient infrastructure,” UNESCAP Blogs, 2020, <https://www.unescap.org/blog/covid-19-reveals-urgent-need-resilient-infrastructure>, accessed 4 March 2021.

<sup>17</sup> Lisa Tao, “China State-Owned Enterprises (SOEs) from an ESG Perspective”, Invesco Insights, 12 May 2021, <https://www.invesco.com/invest-china/en/institutional/insights/china-state-owned-enterprises-from-an-esg-perspective.html>.



planning experience. Given the regional interest in smart-city development, more NEA smart-city partnerships can further regional sustainable-infrastructure cooperation. This could gradually be expanded to a NEA regional smart-city network or regular NEA smart-city conventions. Venues such as the Asia Foundation's Mayor's Forum, gathering senior city officials in Northeast Asia, could be an example. Because of the multidimensional nature of smart cities (i.e., incorporating multiple sustainable-infrastructure technologies), regional discourse on smart cities allows for the exchange of ideas on many different types of sustainable infrastructure.

### **3) Technological exchange and collaboration between NEA research institutions.**

Several Forum participants highlighted the value of ensuring technologically advanced sustainable-infrastructure strategies. Cooperation at various levels, such as between governments, businesses, and research institutes, is good, but it is ideal to foster technological regional cooperation. An example of such collaboration includes the collaboration between Chinese, Japanese, and ROK research institutes on renewable energy research [Myeong] and carbon-pricing initiatives [Fujino]. Additional projects and partnerships should be explored.

## **PROMOTING BANKABLE PROJECTS**

A third set of challenges and opportunities relates to sustainable-infrastructure finance. In 2017, the ADB estimated an infrastructure-finance gap of 5 percent of GDP for developing Asia (not including China).<sup>18</sup> It also suggested that fiscal reforms could generate additional public finance to cover up to 40 percent of the gap, and the region should seek to catalyze the remaining 60 percent from the private sector.<sup>19</sup> This idea of leveraging private investment in infrastructure has become a common refrain. The reality, however, is that private investment in new infrastructure has steadily declined over the past decade.<sup>20</sup> Thus, in its 2020 Global Infrastructure Monitor Report, the Global Infrastructure Hub (GIH) posited that it is time to explore other options, including “true partnerships between the public and private sectors.”<sup>21</sup> This provides an opening for NEA countries, such as China, Japan, and the ROK, to showcase their public-private, blended finance approaches to infrastructure development.

However, NEA policymakers should also more deeply reflect on infrastructure development. As raised in the preceding section, “building back better should not only mean building more; sometimes it should also open the door to building less or building differently to better meet the

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<sup>18</sup> Ra, S. and Li, Z., “Closing the Financing Gap in Asian Infrastructure,” *ADB South Asia Working Paper Series*, June 2018, available at <https://www.adb.org/publications/closing-financing-gap-asian-infrastructure>, accessed 10 January 2021.

<sup>19</sup> Ra, S. and Li, Z., “Closing the Financing Gap in Asian Infrastructure,” *ADB South Asia Working Paper Series*, June 2018, available at <https://www.adb.org/publications/closing-financing-gap-asian-infrastructure>, accessed 10 January 2021.

<sup>20</sup> Global Infrastructure Hub, “Global Infrastructure Monitor 2020 Report,” GIH (website), 2020, available at [https://www.gihub.org/infrastructure-monitor/#Infrastructure\\_Monitor\\_2020\\_Report](https://www.gihub.org/infrastructure-monitor/#Infrastructure_Monitor_2020_Report), accessed 4 March 2021.

<sup>21</sup> Global Infrastructure Hub, “Global Infrastructure Monitor 2020 Report,” GIH (website), 2020, available at [https://www.gihub.org/infrastructure-monitor/#Infrastructure\\_Monitor\\_2020\\_Report](https://www.gihub.org/infrastructure-monitor/#Infrastructure_Monitor_2020_Report), accessed 4 March 2021.

needs of communities.”<sup>22</sup> To some extent, NEA countries' optimism regarding large-scale physical infrastructure stems from the region's infrastructure-led development successes, but times and technologies have changed, and planned or new infrastructure pipelines should adapt to the new context. Indeed, one perspective worth exploring is that the private sector's lack of appetite for infrastructure investment may reflect the fact that the private sector is more forward-looking than the public sector: “The private sector collectively is coming to the conclusion that the 21<sup>st</sup> century is just a different economy where we just don't need these kinds of heavy assets or capital-intensive technologies.”<sup>23</sup> Thus, as described above, reassessing and developing more rational sustainable infrastructure pipelines is crucial, including the clarifying the role of the public sector as setting up the regulatory framework and guidelines for greater private sector ownership and participation; this will likely reduce the financing gap to a more manageable size. Northeast Asian regional cooperation and experience sharing are instrumental in helping to bridge this gap.

### **Policy options drawn from the Forum on how to promote bankable infrastructure projects:**

**1) China, Japan, and the ROK have had great success in financing domestic and international infrastructure projects through public-private partnerships and blended finance.** Rather than waiting for private finance to fill the gap, these countries can actively engage the private sector, while setting-up the right policy frameworks. They can package and promote high-priority bankable projects, de-risk investments, make it easy to invest in infrastructure (e.g., bond offerings), and arrange different types of finance for different phases of projects (including MDB and bilateral concessional loans). Consolidating and sharing the good practices of China, Japan, and the ROK would be of great value to less-experienced countries. NEA knowledge sharing should be coordinated with broader MDB and international efforts, such as the ADB Quality Infrastructure Partnership (through which Japan committed approximately \$116 billion to finance infrastructure in Asia from 2016 to 2020) and the Global Climate Fund (which funded Mongolia's green finance corporation [Sumkhuu]). Forum participants noted the importance of linking MDBs and international organizations, as MDBs have historically played a significant role in financing and leveraging private financing for infrastructure [Takahashi; Sadicon; Jung, H.-S.].

**2) China, Japan, and the ROK are also active providers of development finance for sustainable infrastructure projects.** Given that these three countries count among the top public funders of global infrastructure, prioritizing development-finance allocations could accelerate the sustainable-infrastructure movement. For example, Japan recently updated its Strategy of Exporting Infrastructure to prioritize infrastructure with high environmental performance from 2021 onwards [Fujino]. The ROK government provided

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<sup>22</sup> Kane, J. and Vajjhala, S., “Prioritize people, not projects: Addressing the harms of legacy infrastructure in the COVID-19 recovery,” Brookings, 2020, <https://www.brookings.edu/research/prioritize-people-not-projects-addressing-the-harms-of-legacy-infrastructure-in-the-covid-19-recovery/>, accessed 4 March 2021.

<sup>23</sup> Gomes, J., “Why Private Investment in Public Infrastructure is Declining,” Knowledge@Wharton (podcast), 2018, <https://knowledge.wharton.upenn.edu/article/private-investment-in-public-infrastructure/>, accessed 4 March 2021.

export credits and other support to encourage exporting ROK infrastructure expertise, including smart-city technologies.<sup>24, 25</sup>

## REGIONAL DYNAMICS AND COOPERATION

In the Forum Framing Address, Professor Tae Yong Jung noted that Northeast Asian regional cooperation is geopolitically challenging. Given this context, and the fact that sustainable infrastructure, itself, is a complex concept, regional sustainable infrastructure cooperation is often more aspirational than operational. While not explicitly discussed at the Forum, China, Japan, and the ROK also compete within exporting sustainable infrastructure visions and technologies (e.g., China's BRI versus Japan's Indo-Pacific, and ROK versus Chinese smart-city models). Moreover, China, Japan, and the ROK have relatively comprehensive and mature stocks of traditional infrastructure and aspirations that require new, technologically advanced infrastructure, whereas Mongolia and the DPRK still have significant gray/traditional infrastructure needs. That said, most Forum participants recognized the value of regional cooperation for sustainable development, which is inextricably linked to the continued health and growth of the regional economy. This consensus paved the way for constructive dialogue and a practical examination of existing channels for regional sustainable infrastructure cooperation. Huaqing Tang from the Chinese Ministry of Ecology and Environment (MEE) and Maria Fideles Sadicon impressed upon the Forum the importance of making full use of existing mechanisms to advance NEA regional sustainable infrastructure cooperation.

### Policy options drawn from the Forum on how to bolster regional development include:

- 1) Development cooperation programs** in China, Japan, and the ROK are heavily-oriented towards economic infrastructure, particularly transportation and energy. As major NEA infrastructure sponsors through their development cooperation programs, the three countries are uniquely positioned to influence the scale and type (more or less sustainable) of infrastructure in the region. It is a natural starting point for NEA countries to cooperate regionally by rationalizing and synergizing their infrastructure-development assistance.
- 2) Multi-sector (government, research institutes, and private sector) regional cooperation** will help bypass initial bottlenecks. Several Forum participants explained the issue of delayed inter-governmental cooperation for sustainable infrastructure, as suggested by Yongduk Pak of the Korea Energy Economics Institute (KEEI). Therefore, regional cooperation should move more quickly at the level of research institutes (which develop cooperation ideas) and the private sector (which finances and operationalizes ideas), even while government agencies proceed more cautiously.

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<sup>24</sup> “S. Korea eyes support for local companies in global infrastructure markets,” Yonhap News Agency, 3 January 2020, All News, available at <https://en.yna.co.kr/view/AEN20200103001700320>, accessed 2 March 2021.

<sup>25</sup> Herh. M., “S. Korea to Create 1.5 Tril. Won Fund to Boost Smart City Exports,” Business Korea, 11 February 2019, available at <http://www.businesskorea.co.kr/news/articleView.html?idxno=28986>, accessed 2 March 2021.

Northeast Asian regional mechanisms under which multi-sector sustainable infrastructure cooperation could advance include the China Energy Research Institute (ERI)-Japan (IEEJ)-KEEI research institute/think tank collaboration on renewable energy; China-Japan-Korea Environment Ministers meeting; the International Forum for Sustainable Asia and the Pacific (an annual forum to share information and facilitate discussion on sustainable development in Asia and the Pacific); and the Platform for Redesign 2020, which invited all United Nations Framework Convention on Climate Change (UNFCCC) parties, containing 197 countries/regions, to redesign current socioeconomic and sociocultural systems for long-term sustainability and resilience [Pak; Jung, H.-S.; Fujino; Takahashi].

**3) Zero-carbon pledges and policy synchronization** are important new opportunities to pursue. China, Japan, and the ROK have all pledged to achieve carbon neutrality by 2050 (2060 for China). If all three countries are driven by their zero-carbon pledges to pursue synchronized sustainable infrastructure measures, their competitiveness would not be unduly affected [Jung, H.-S.]. Thus, it is an opportune time for Chinese, Japanese, and ROK policymakers to take advantage of the momentum of their zero-carbon pledges to push through sustainability measures with less industry resistance.

## CONCLUSION

The rapidly evolving nature of sustainable infrastructure – especially illustrated by the challenges that emerged out of the COVID-19 pandemic – necessitates sustainable-infrastructure actors to innovatively respond to changing conditions and parameters. Dialogue and cooperation among countries, private sector actors, and other stakeholders will enable these infrastructure paradigms to stay on the cutting edge of technology and leverage one another's strengths so that the NEA region's development, as a whole, is greater than the sum of each country's capacities. Three NEA countries – China, Japan, and the ROK – are major infrastructure investors; development cooperation between these countries and with other countries in the region is of the utmost importance. For this to happen, however, NEA countries need to find a common voice and vision via more regular and constructive dialogue. If these three donors can find common ground, there are potential benefits for greater connectivity, integration, and prosperity across the region, as well as for the wider international community.

## ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
BRI	Belt and Road Initiative
CCUD/NDRC	China Center for Urban Development, National Development and Reform Commission (China)
CIKD/DRC	Center for Urban Development, Development Research Center of the State Council of China
ERI	China Energy Research Institute
GTC	Green Technology Center (ROK)
GTI	Greater Tumen Initiative
iGDP	Innovative Green Development Programme
IEEJ	The Institute of Energy Economics (Japan)
IGES	Institute for Global Environmental Strategies
KDI School	Korea Development Institute School of Public Policy and Management
KEEI	Korea Energy Economics Institute
KEI	Korea Environment Institute
MEE	Ministry of Ecology and Environment (China)
NDA	National Development Agency (Mongolia)
NDCs	Nationally Determined Contributions
NEA	Northeast Asia
ODA	Official Development Assistance
TAF	The Asia Foundation
UNFCC	United Nations Framework Convention on Climate Change
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific

## **LIST OF SPEAKERS AND THEIR AFFILIATION**

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