

1. Introduction: Incentives and Impediments to Carbon Market Cooperation in Northeast Asia

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CHINA, JAPAN, AND THE REPUBLIC OF KOREA ARE EMERGING AS MAJOR PLAYERS in the global carbon trading landscape.¹ China is moving from piloting multiyear subnational emissions trading systems (ETSs) to a national scheme launched provisionally in December 2017. The Republic of Korea (hereafter Korea) already operates the first national ETS in Asia, which moved into Phase II in 2018 and will begin to price allowances and open up further to international market connections. Japan continues to operate linked ETSs in Tokyo and Saitama Prefecture along with a voluntary national scheme and a unique international offset program.

With the three Northeast Asian countries already connected through deep economic ties and shared environmental challenges, calls for them to link their respective markets are becoming louder and more regular.² Linking could have economic, environmental, and strategic benefits.³ Economically, linking could reduce the costs of emissions reductions by creating options for purchasing credits that are cheaper than those available at home. Links could also increase the number of buyers and sellers in ways that increase market liquidity and reduce carbon price volatility by expanding market scope and lessening the influence of powerful individual players. Environmentally, links could cut carbon price differentials across the region in ways that minimize the movement of emitting activities from one jurisdiction to another (leakage) and in some cases promote cleaner local environments through reducing conventional pollution (a co-benefit). Most importantly, lower emissions reduction costs could enable more ambitious climate change goals. Strategically, linking Northeast Asian markets could provide confidence-building measures for wider regional relationships and create a more level playing field for countries already inextricably connected by trade and geopolitical challenges and opportunities. It could also demonstrate global climate change leadership in Northeast Asia by signaling a commitment to long-term multilateral actions that are impactful and nuanced, and in doing so increase the impact of China, Japan, and Korea in international fora.

However, regional linkage remains a difficult prospect. China, Japan, and Korea are focused on designing and operating effective domestic carbon markets. While creating the opportunities outlined above, linkage also adds layers of technical and diplomatic complexity that will take time and political will to reconcile.⁴ Each system has unique characteristics that reflect its domestic contexts, and the role that each country sees its ETS playing.

NORTHEAST ASIA'S VARIED CARBON MARKET LANDSCAPE

China seeks future development alongside cleaner environments, narrower income disparities, and a greater emphasis on high-value segments of the global economy.⁵ It is launching a national ETS not just to address climate change but also as a tool to help usher in this new era. While it orients around greenhouse gas mitigation, China's ETS is also important in the minds of Chinese leadership as a way to curtail crippling air pollution, encourage growth in emergent sectors, and transfer wealth to peripheral provinces. As such, it exists within a complicated and often overlapping environmental policy space marked by existing and proposed policies for energy efficiency, air pollution, and renewable energy.⁶ These policy tools, which include a newly launched tradeable green certificate scheme to support clean energy, expand the risk of double counting and create complex interactions with the supply and demand of carbon credits. There are also myriad questions about interministerial and city–provincial–central government coordination. China's environmental governance overhaul of March 2018, which created the new Ministry of Ecology and Environment from which its ETS will now be run, is designed in part to address these ambiguities. But they will not be resolved overnight, and China's new ministerial structure will undergo growing pains in tandem with its ETS.⁷

China's national ETS builds from subnational pilot systems, and its development has been marked by uncertainty, delay, and dwindling near-term ambition. Initially slated for 2017, only months prior to its planned rollout, basic questions remained on when the scheme would start, what the rules would be, where it would be housed, and who would participate. Issues of precise coverage, allowance allocation, and compliance obligations continue to plague regulators at the time of this writing. Initial ETS coverage was first pared down to the power generation, aluminum, cement, and aviation sectors, with China ultimately likely opting for a power sector–only ETS in response to lingering uncertainties and industry concerns. The national system may have no compliance obligations for the first two years, making it a soft launch geared more toward getting market rules and operations in place than to having a discernable climate change impact. Most challengingly for regional linkage, China's ETS is based on tradeable performance standards (TPSs) rather than absolute caps. TPS trade calls on government administrators to determine maximum emission intensity relative to the output of a given firm. Firms with emission rates below the standard earn tradable credits, while those that exceed the standard must purchase allowances to cover the excess. The TPS approach has the advantage of adapting to economic changes, but it also creates questions about linking to other schemes that are based on unmoving emissions limits.⁸

Japan seeks to meet its climate change goals during a lingering period of energy uncertainty. The 2011 Fukushima nuclear disaster continues to loom over Japanese energy decisions, with scant public confidence in the safety of Japan's nuclear sector—which had supplied 30 percent of Japan's electricity production—and calls to phase out nuclear energy entirely. While that may or may not ultimately happen (some use of nuclear energy currently remains in Japan's future energy plans), it is unlikely that use of nuclear energy will reach pre-Fukushima levels in the foreseeable future, and virtually certain that it will not expand to the levels previously foreseen (some 60 percent of Japan's energy mix by 2100). With Japan facing natural and self-inflicted regulatory barriers to renewable energy expansion, it is replacing the lost nuclear capacity largely with fossil fuels. Given Japan's high development status, and the fact that it is already a global energy efficiency leader, it has few cost-effective domestic options for lowering emissions in-line with its climate change commitments—to say nothing of the more ambitious commitments it will be called on to make in the future.⁹

This scenario incentivizes establishing international market links that offer Japan cheaper emissions options than it currently has available, but there are structural impediments to this path. Japan has no national ETS, instead operating a subnational scheme with linked markets in Tokyo and Saitama Prefecture; a voluntary national system used by companies for reporting and corporate social responsibility purposes (J-Credit); and an international offset program called the Joint Crediting Mechanism (JCM), in which Japan invests in emissions reductions in developing countries in exchange for part of the credits that these projects yield. While the country has nearly two decades of experience with domestic emissions trading, it has no current plans to legislate or regulate toward a mandatory national system. This creates parity challenges for its ability to link with markets in China and Korea and may encourage Japan to simply double down on its JCM efforts at the expense of more impactful—but also more complicated—regional links in Northeast Asia.

Korea meanwhile has rapidly transitioned from a poor postwar state in the early 1950s to a major industrial player by the 1970s to a modern, digitized economy in the 21st century. This change brought pronounced environmental challenges alongside it, which Korea is attempting to address with command-and-control regulations and its nascent national carbon market.¹⁰ The market—the Korean ETS (KETS)—is the first national system in Asia and at this writing is moving from the first to the second of a three-phase process that runs to 2025.

Since the KETS launched in 2015, it has been plagued by a lack of liquidity and the sense among major firms that it offers few pathways for significantly driving down abatement costs. In 2017, the Ministry of Strategy and Finance (MOSF) implemented market stabilization measures to address supply-demand imbalances, restrict excessive banking credits, increase borrowing provisions, and bring forward the introduction of international market mechanisms from 2021 to 2018. Still, the characteristics of the Korean economy—particularly its dependence on energy-intensive industries and high volume of fossil fuel imports¹¹—are making market-driven domestic emissions reductions difficult. These difficulties are amplified by regulatory uncertainty, which creates questions about the future of KETS operations while eroding confidence in the staying power of green investment incentives. In a telling vacillation, the KETS has been transferred from the Ministry of Environment (MOE) to the MOSF and recently back to the MOE since its implementation. Such wavering makes it difficult to secure the confidence of domestic stakeholders, and even more so prospective regional partners.

For market linkage in Northeast Asia to be possible, targeted research needs to help policymakers consider the core questions they face.

EXTENDING THE EVIDENCE BASE NOW

The differences and challenges detailed in the previous paragraphs mean that deep national-level market links are years away from taking hold in Northeast Asia, with such links emerging during the early 2020s offering the earliest plausible time line. This does not mean that technical and track II diplomatic work on these issues should be delayed. For market linkage in Northeast Asia to be possible, targeted research needs to help policymakers consider the core questions they face. Lead times for building the linkage foundation in other contexts show the value of early action. The Norwegian market was conceived in the early 2000s, launched in 2005, and linked with the EU in 2008. Linkage was considered and worked toward from

its early days of formulation, not just after its 2005 launch. California and Québec likewise studied and adopted many of the same market design principles and held frequent technical discussions during the years of their development to ensure a degree of harmonization across targeted rules and designs. This allowed them to link the markets just one year after launching operations.

The Northeast Asian context is different from these other linkage experiences, but process lessons on consultation, dialogue, and applied research efforts still pertain. Building from multiple closed-door technical and policy dialogues, public panels, private consultations, and desk research, this volume extends the research foundation for carbon market linkage efforts in China, Korea, and Japan. It takes this work in multiple directions.

Chapters two through four explore key linkage building blocks—both broadly and specifically for Northeast Asia. In chapter two, Jeff Swartz elaborates on the essential building blocks for regional carbon market cooperation and linkage. Upon offering a brief but comprehensive juxtaposition of the differences among the Northeast Asian countries of China, Korea, and Japan, Swartz still argues unyieldingly that linkage could pay significant dividends for industry while offering opportunities for governments. Anticipating the multiple approaches advocated for elsewhere in the volume, Swartz claims that a range of linkage and cooperative options warrant consideration—from bilateral and plurilateral linkages to carbon market clubs—as each can help polities increase their emissions reduction ambitions while lessening competitiveness and carbon leakage concerns. In chapter three, Michael Mehling reminds the reader of the importance of rules and institutions during the pursuit and later execution of linkage policies. He argues that having proper legal and institutional frameworks in place, both domestically and internationally, is essential to enjoying the potential value of linkage and avoiding the pitfalls of mismatched ambition and structural convolution. Vitaly, Mehling does not argue for a one-sized framework but rather presents different levels of legal formalization along a linkage continuum. Finally, while multiple authors delve into issues surrounding Article 6 of the Paris Agreement, Robert Stowe takes it head on in chapter four. He presents a new analysis on how different approaches to cap-setting in Northeast Asian countries will impact their respective abilities to utilize Article 6's internationally transferred mitigation outcomes (ITMOs); despite the challenges, he notes that the Paris Agreement is predicated in many ways on iteration, future learning, and malleable policy evolutions. It therefore offers opportunities for Northeast Asia that may not be fully in the current view.

Chapters five through seven tackle more directly the benefits, barriers, and processes that could define carbon market linkage in Northeast Asia. Kirby Ledvina and Niven Winchester in chapter five make the most substantive and quantitative case in the volume on the potential economic dividends accompanying linkage. They review literature on internationally traded carbon allowances to claim that applied general equilibrium (AGE) models offer insights into the marginal abatement cost (MAC) curve impacts of linked markets. While Ledvina and Winchester relate these findings to the Northeast Asian context, their piece underwrites a potential future wave of scholarship into the issues. In chapter six, Baran Doda presents an inverse analysis on the barriers to carbon market linkage in Northeast Asia and more broadly. The capstone from which arguments flow is that the costs and benefits of linkage are unevenly distributed, which is certainly true. Doda's critical contribution is the way that he applies this analysis not just to the economic and greenhouse gas implications of linked markets but also to larger issues of social impact, co-benefits, and strategic calculations. These issues are particularly germane to Northeast Asia, where carbon markets have multipart mandates, environmental and economic challenges are regionally entwined, and

strategic relationships are complex and sometimes fraught. Suh-Yong Chung argues in chapter seven that conventional carbon market linkage is not the solitary path forward. Rather, market mechanisms offer a wide range of opportunities to cooperate on climate mitigation. Collaborative offset projects that include China, Korea, and Japan, and are pursued in-line with Article 6 principles, offer unique and relatively low-hanging potential.

Chapters eight to ten present further granularity on regional linkage prospects from Chinese and Japanese perspectives. In chapter eight, Xi Liang trumpets linkage readiness as the apt operative goal for China in the near term. While China has explicitly declared linkage possibilities to be years in the future and is currently fixated on domestic progress, Chinese policy makers have taken steps toward some design of harmonization with other systems and engaged in track II linkage dialogue with their regional neighbors. Liang offers a raft of recommendations too extensive to list here on how these efforts can be deepened and furthered. Sven Rudolph, in chapter nine, lays bare Japan's uphill climb toward a potential future national market, while not ruling it out, and elaborates the powerful opposition faced by Japan's carbon market advocates and policy practitioners. In the near term, Rudolph argues that the existing Tokyo ETS holds the most promise for international engagement and linkage. Toshi Arimura agrees in chapter 10, and argues most directly on a theme found throughout much of the volume—that carbon market linkage offers developed and developing economies in Northeast Asia symbiotic opportunities to reduce emissions in cost effective ways. Arimura focuses on Japan's need to further international engagement because of high costs at home, and the promise of engaging with China. Similar arguments pertain for Korea.

Stefano De Clara concludes the volume in Chapter 11 by making the business case for linked markets.¹² He melds the conceptual economic efficiency and environmental arguments for linked markets with observed benefits elsewhere and, vitally, with the publically declared preferences of business leaders around the world. Such links in Northeast Asia could help address competitiveness concerns while concurrently offering businesses cheaper emissions reduction options.

FUTURE PROSPECTS

This volume seeks to help Northeast Asian stakeholders pursue a unique and potentially high-value opportunity. China, Japan, and Korea have different economic and energy contexts, different past and present approaches to carbon market design and operations, and different levels of enthusiasm for regional linkage possibilities in Northeast Asia. Yet some such differences reveal the very complementarities that make regional market cooperation and select linkage symbiotically advantageous. Linking would allow China to drive foreign purchases of its emissions reduction credits, improve its measurement, reporting and verification (MRV) and operational effectiveness to meet additional standards, and develop new investment sources for its expansive economic and energy transition goals. Targeted links would increase Japan's access to cheaper reduction options than it has at home and be more efficient and impactful than its current domestic and international offset strategies. Korea is set to use international market connections to meet its climate change targets, and connecting with the Chinese market could help widen its currently limited abatement options.

Past linkage efforts demonstrate that while geographic proximity and close economic ties can play a crucial role in building a relationship toward linkage, these factors do not guarantee a successful market integration because integrating carbon markets requires a series of preliminary steps and pilot initiatives to be successful. Regardless of what actual steps are pursued, linkage will necessarily be less complicated

and easier to achieve when design elements and political considerations are discussed during the initial phases of carbon market development. Because Northeast Asia is in the formative phase of carbon market construction, the countries have an opportunity to synergize some design elements in the near term and begin working through economic and geopolitical challenges that accompany market cooperation.

The 2018–2020 period will be formative for the longer-term landscape of carbon pricing in Northeast Asia. Korea and China will progressively deepen their domestic ETSs and seek to optimize their functionality through experimentation and capacity building. Japan will review its domestic and international pricing efforts and likely be influenced by the progress in neighboring countries. These countries need to collaborate now to build a foundation for more extensive carbon market cooperation in the future. Continuing work is needed to build the evidence base from which they can work.

ENDNOTES

- ¹ This framing chapter is partially adapted from Jackson Ewing, “Building the Evidence Base for Carbon Market Linkage in Northeast Asia,” Asia Society Policy Institute, December 15, 2017, <https://asiasociety.org/sites/default/files/2017-12/White%20Paper%20-%20Building%20the%20Evidence%20Base%20for%20Carbon%20Market%20Linkage%20in%20Northeast%20Asia.pdf>.
- ² Jackson Ewing and Minyoung Shin, “Northeast Asia and the Next Generation of Carbon Market Cooperation,” Asia Society Policy Institute, December 2017, <https://asiasociety.org/sites/default/files/2017-12/NextGen%20Report%20FINAL%20WEB.pdf>; “China, Japan, Korea Carbon Market Links Resurface as Talks Set for Next Week,” Carbon Pulse, December 16, 2017, <http://carbon-pulse.com/44890/>.
- ³ Jackson Ewing, “Roadmap to a Northeast Asian Carbon Market,” Asia Society Policy Institute, September 2016, <http://asiasociety.org/files/RoadmapNortheastern-final-online+.pdf>; Michael Mehling and Benjamin Görlach, “Multilateral Linking of Emissions Trading Systems,” (working paper 2016-009, Center for Energy and Environmental Policy Research, Massachusetts Institute of Technology, Cambridge, MA, April 2016), <http://ceep.mit.edu/files/papers/16-009.pdf>.
- ⁴ Jessica F. Green, “Don’t Link Carbon Markets,” *Nature* 543, no. 7646 (March 2017): 484–486, doi: 10.1038/543484a.
- ⁵ Jackson Ewing, “China’s ETS at Home and Abroad,” Carbon Pricing Leadership Coalition, August 29, 2017, www.carbonpricingleadership.org/blogs/2017/8/29/chinas-ets-at-home-and-abroad.
- ⁶ Jessica Teets, “The Power of Policy Networks in Authoritarian Regimes: Changing Environmental Policy in China,” *Governance* 31, no. 1 (January 2017): 125–141, <https://doi.org/10.1111/gove.12280>.
- ⁷ Jackson Ewing, “Tough Tasks for China’s New Environment Ministry,” *The Diplomat*, March 17, 2018, <https://thediplomat.com/2018/03/tough-tasks-for-chinas-new-environment-ministry/>.
- ⁸ Lawrence Goulder and Richard Morgenstern, “China’s Rate-Based Approach to Reducing CO₂ Emissions: Strengths, Limitations, and Alternatives” (presentation, Annual Meeting of the American Economic Association, Philadelphia, PA, January 5, 2018), www.aeaweb.org/conference/2018/preliminary/paper/Adat9KGT.
- ⁹ Ewing and Shin, “Northeast Asia.”
- ¹⁰ Sung-Young Kim and Elizabeth Thurbon, “Developmental Environmentalism: Explaining South Korea’s Ambitious Pursuit of Green Growth,” *Politics & Society* 43, no. 2 (March 2015): 213–240, <https://doi.org/10.1177/0032329215571287>.
- ¹¹ Sagar Kafle et al., “A Review on Energy Systems and GHG Emissions Reduction Plan and Policy of the Republic of Korea: Past, Present, and Future,” *Renewable and Sustainable Energy Reviews* 73 (June 2017): 1123–1130, <http://dx.doi.org/10.1016/j.rser.2017.01.180>.
- ¹² Carbon market linkage and the business sector in Northeast Asia is furthered explored in ASPI’s paper. Asia Society Policy Institute, “Business Sector Action for Carbon Market Cooperation in Northeast Asia,” May 2018, <https://asiasociety.org/sites/default/files/2018-05/Business%20Sector%20Action%20Report.pdf>.