2. Building the Foundation for Regional Carbon Market Linkage in Northeast Asia

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SUMMARY

CHINA, KOREA, AND JAPAN NOW HAVE VARIATIONS OF A CARBON MARKET at the national or subnational level, but there are wide differences in policy design and implementation status. Linkage of carbon markets in Northeast Asia could reduce industry concerns on competitiveness and offer opportunities for governments to raise emission reduction targets. The Republic of Korea's (hereafter Korea) ETS is the most advanced, and it can share many lessons learned and experiences to policy makers and industries in both China and Japan. There are ample opportunities for increased dialogue between China, Korea, and Japan on carbon markets.

BACKGROUND

Cooperation on carbon markets through bilateral or plurilateral linkages or "carbon market clubs" can both help countries and regions increase the ambition of their emission reduction targets and address competitiveness and carbon leakage concerns. Regardless of how potential connections emerge in Northeast Asia, China's participation will be absolutely critical to addressing climate change as it is the region's largest emitter, economy, and carbon market.

Linkage of carbon markets in Northeast Asia could reduce industry concerns on competitiveness and offer opportunities for governments to raise emission reduction targets.

With the launch of China's national emissions trading system (ETS) in December 2017, carbon markets are now operational in all major economies of Northeast Asia. Korea, the first country in Northeast Asia to introduce an economy-wide ETS, will start the second phase of its ETS in 2018, and Japan has subnational ETSs in place in the city of Tokyo and in Saitama Prefecture and voluntary markets driven by private sector actors. China's national ETS will first begin with a pilot phase for companies in the power sector until 2020 when an initial trading phase will commence. It is anticipated that other major emitting sectors of the economy, such as cement, iron, steel, and petrochemicals, will be gradually added into the ETS over time.

Despite the fact that these three major economies now have a price on carbon to reduce emissions, the design of each ETS is particularly distinct. That should not come as a surprise, since each of these policies was created and implemented by policy makers to reduce the specific emissions in their respective countries. Carbon emissions are a transboundary issue that can only meaningfully be reduced at a scale through regional or international climate policies.

This year, 2018, marks the starting point for these three countries to come together to look at constructive ways to cooperate on carbon pricing so that emissions can be reduced at a greater scale and competitiveness concerns can diminish. This chapter will identify and explore concrete suggestions for China, Japan, and Korea to cooperate on carbon pricing, with the ultimate goal of a linked emissions-trading system with a mutual pool of carbon allowances that can be easily exchanged across these three distinct systems.

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The chapter will explore the following key question: *What are the most constructive steps to take between 2018 and 2020 to build the foundation for regional market linkage?* The first section will discuss the current status of emissions-trading systems in China, Japan, and Korea and identify the gaps in implementation for each of these three systems. The section compares the implementation and time lines of each ETS as well as its cap coverage, current price levels, accounting framework, and offset framework. These topics were chosen because they represent a cross section of the essential elements in any ETS. Section two includes a comparative analysis of the policy design for each system by exploring policy similarities and differences and identifying several areas for potential policy cooperation. The third section of the chapter focuses on opportunities for international cooperation, going into detail on several concrete suggestions for linkage.

POLICY MAPPING ACROSS CHINA, KOREA, AND JAPAN

This section of the paper focuses on policy mapping. In order to understand the key concrete steps for regional carbon market linkage, this section summarizes policy information for each ETS.

China's National ETS

Building upon the seven regional ETS pilots created in 2013, China formally "launched" its national ETS on December 19, 2017. The launch took place more than two years after President Xi Jinping announced during his visit to the White House in September 2015 that China would have a nationwide ETS, a development that was widely anticipated by both the Chinese and the international climate change community.

Implementation Status and Timeline

China's ETS, in its current form, has been substantially scaled back in terms of its scope and ambition compared to draft versions that were released by China's National Development and Reform Commission (NDRC) in 2016.[1] For example, the only sector to be included during this first "trial" stage of the national ETS is the power sector, whereas the NDRC's draft plans anticipated that eight sectors of the economy would be included at the start of the ETS. The first, trial stage of the national ETS is expected to last until 2020 and will serve as a market simulation, meaning that power sector companies will have no formal compliance obligations and face no penalties for noncompliance during this phase of the ETS.[2] It is unclear how long the trial period will last, and when and if other industrial sectors will be gradually phased into the ETS.

As of May 2018, no power sector company in China has yet to receive its initial allocation of emissions allowances. The national ETS registry, to be managed by the climate change authorities in the newly formed Ministry of Ecology and Environment (which is taking over these duties from the NDRC), has also yet to be finalized, and power sector companies have had limited interactions with the registry interface to date.

Coverage

The national ETS is expected to cover any stationary power source that consumes more than 10,000 tons of coal equivalent per year.[3] There are no geographic restrictions on where these stationary sources could be located; therefore, the ETS is in effect a national system that covers all provincial power emissions. Provincial power grids vary widely in China: heavily industrialized northeast China has a coal-heavy grid, while the southern provinces generally have a more diverse energy mix with natural gas and nuclear having an increasingly greater share.

Accounting Framework

China's measurement, reporting, and verification (MRV) system has largely been set up based on the design of MRV rules in the European Union ETS (EU ETS). The EU-China ETS Project, an EU-funded technical cooperation agreement with China, has included several modules on MRV since its inception in 2015,[4] which have influenced the design of China's MRV system for the ETS. However, one critical difference with the EU ETS in China's ETS is the inclusion of indirect emissions in addition to direct emissions.[5] Policy makers in China's ETS are intent on preventing carbon leakage by including indirect emissions, but the result is that the accounting framework in China will be unique among other ETSs by having to include these emissions sources. Another unique feature of the Chinese market is its focus on energy efficiency targets rather than hard caps, which from an accounting perspective means that both emissions and production output must be measured in concert.[6]

Partially in response to this need, and with support from the World Bank's Partnership for Market Readiness (PMR), China has received World Bank funding for a continuous emissions-monitoring system (CEMS). This system allows China to monitor emissions included in ETS sectors in real time as well as measuring the carbon content (in calorific value) of inputs and outputs to products manufactured by installations included in the ETS. As of May 2018, power sector installations in the national ETS have already submitted verification reports for year 2017 emissions and will do so again for year 2018 emissions in order for the NDRC to allocate allowances. The design of the MRV systems in the seven ETS pilots differ slightly from the national ETS MRV system but are largely based on the same principles.

Carbon Price Levels

Unintentionally, carbon prices have fluctuated widely in the seven ETS pilots since they launched in 2013. Due to a general practice of over-allocating allowances by the provincial development and reform commissions (DRCs), there has been an overall lack of liquidity and therefore carbon prices have varied widely. For example, prices started at a relatively high level when the ETS pilots launched but dropped significantly thereafter. Most ETS participants chose (and continue to choose) to hold onto their allowances for the purpose of surrendering them back to the DRCs at the end of the compliance year rather than selling or buying allowances for purely speculative or financial reasons. In the third quarter of 2017, the average price in the pilots stood at USD 3.13 per ton.[7] Since initial allowances have not yet been allocated under the national ETS, there is no indicative or reliable pricing information at the time of writing.

Flexibility mechanisms

Under the seven ETS pilots, included installations could use Chinese Certified Emission Reductions (CCERs), a domestic offset system, for meeting between 5 and 10 percent of their compliance obligation depending on the specific pilot. The draft rules for the national ETS also include provisions for allowing installations to use CCERs for meeting a portion of their compliance obligation, but the NDRC temporarily halted CCER issuances in 2017[8] and has not indicated how CCERs will be used in the current trial period of the ETS.

Korea's ETS

Korea was the first country in Northeast Asia to implement an ETS when it launched in 2015. According to the Korean Ministry of Environment (MOE), The Korea ETS (KETS) is expected to play a significant role in enabling Korea to meet its nationally determined commitment (NDC) target of reducing emissions by 37 percent below business-as-usual emissions. Since the launch of its ETS in 2015, the Korean government has struggled to win over business support for the ETS, and there has been a ministerial clash between the MOE and the Ministry of Strategy and Finance over which should have the responsibility of administering and enforcing the ETS. As of May 2018, the KETS is in its second phase, which started on January 1, 2018, and is under MOE authority.

Implementation and Timeline

Since the first phase of the KETS, which ran from January 2015 to March 2017, Korea's ETS implementation and time line have been more developed than China's in terms of policy complexity and detail. During this time, 18.7 $MtCO_2e$ was exchanged among 524 entities. The government issued 100 percent of allowances for free during this phase using historical emissions (aka grandfathering) with the exception of clinker, oil refining, and aviation, which used benchmark data to receive their allowances. During Phase II of the KETS, which will run until December 2020, the Korean government is expected to auction 3 percent of the total volume of allowances. However, auctions for 2018 have been postponed indefinitely,[9] which has undermined the ambition of the phase and prevented the government from realizing a potential source of revenues. The government is also expected to move toward establishing benchmarks for all sectors included in the KETS during the second phase. Phase III of the KETS is planned to run from January 2021 to January 2025, and at least 10 percent of allowances are planned to be distributed by auctions.

Coverage

The KETS covers any company with an installation that emits more than 125,000 tons of CO_2 per year and targets the six Kyoto greenhouse gases. As the KETS is economy wide, it covers a wide range of sectors, including domestic aviation. In total, 23 sectors and 5 subsectors are included in the KETS[10] with 67 percent of the country's emissions covered.[11] The power and steel sectors are the largest emitters and make up a more than significant share of installations covered under the KETS.

Accounting Framework

During the first phase of the KETS, the government set up MRV standards that have been designed using best practices from the EU ETS and California's carbon market. The government plans to update the MRV standards continuously as more sectors move toward benchmark-based allocation. Korea is currently

exploring how product benchmarks have been set in the EU ETS and applying a similar practice for installations under the KETS. Importantly for regional cooperation prospects, Korea's overarching climate change targets call for 11.3 percent of its emissions reductions to come from internationally cooperative approaches. Whether this is met through offsets, market links, or a combination remains to be seen.

Carbon Price Levels

As 100 percent of allowances have been distributed for free to companies under the KETS, there has been little incentive to date for companies in Korea to trade allowances. As a result, there is an overall lack of liquidity in the KETS and a very low traded volume. As of May 2018, the price of allowances (KAUs) was close to or slightly above KRW 22,000 (USD 20.50) according to the Korean Exchange KRX.[12] Compared to most ETSs, Korea's has relatively high prices as there is no carbon price floor (CPF) or ceiling, and the market price is set only on the few trades that have taken place to date.

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Flexibility Mechanisms

Each company under the KETS could use up to 10 percent of its total allocated allowances with offsets. During Phase I, only offsets from projects located within Korea could be used for compliance, and these offsets had to come from eligible CDM methodologies and be issued after April 2010. During Phase II, offsets from projects located outside Korea can be used only if the Korean company using them has at least a 20 percent investment in the actual project that is reducing emissions. The government is exploring how emission reductions under Article 6 of the Paris Agreement—which covers international mitigation cooperation—can be used for Phase III of the KETS.

Japan

Japan currently does not have a national carbon-pricing system in place. In 2005, Japan pioneered a domestic voluntary ETS and domestic offset system (JVETS and J-Credit). These pilots ended in 2012, and the government of Japan has not yet introduced an ETS. Since 2012, Japan has levied a USD 0.95 to USD 3.00 carbon tax on upstream petroleum and coal emissions[13] and operates mandatory ETSs in the Tokyo Metropolitan Region (TMR) and the Saitama Prefecture.

Implementation and Timeline

Japan's citywide ETS in the TMR has operated since 2010 as has the Saitama ETS, which is linked to Tokyo. Since 2013, Japan has also established the Joint Crediting Mechanism (JCM) to allow Japanese companies to provide technology transfer to other countries in return for earning the emissions reductions that will count toward Japan's NDC. The JCM—already an offset program of substantial size—is expected to issue more than 50 million tons of CO_2e by 2030.

Coverage

Japan's carbon tax covers less than 5 percent of its total emissions, whereas the TMR and Saitama ETSs have an emissions inventory that is largely made up of the building and transportation sectors. There are approximately 1,200 covered entities in the Tokyo ETS as of 2018.[14] As a result, Japan does not have a high percentage of emissions covered by its current carbon price systems.

Accounting Framework

Companies included in the Tokyo and Saitama ETSs must submit an annual emissions report that must be verified with a third-party verification agency that is registered with the Tokyo authorities. The JCM uses an MRV framework with reference-level emissions as a benchmark in the 50+ countries that have signed a JCM cooperation agreement with Japan.[15]

Carbon Price Levels

There is no publicly listed information of carbon prices in the Tokyo and Saitama ETSs; this is reputed to be because no transactions occurred during the past year of activity. As a result, liquidity is much lower than in China and Korea.

Flexibility Mechanisms

The Tokyo and Saitama ETSs allow for offsets from renewable energy and for installing energy-saving and emissions reduction activities for small and midsize entities.[16]

COMPARATIVE ANALYSIS OF CHINESE, KOREAN, AND JAPANESE ETSs

While there are identifiable areas where China, Korea, and Japan could collaborate over their differences on emissions trading, significant relevant differences exist among this trio of countries. While Korea and Japan are similar in terms of economic development and GDP levels, China's level of economic development and economic output is vastly different in terms of carbon intensity. Therefore, there are limitations as to how much policy comparability is possible for carbon markets in Northeast Asia. This section provides a summary of the expected policy developments for each ETS during the period of 2018 to 2025, with a particular focus on efforts and challenges to implementing a national ETS in Japan.

Offsets and Flexibility Provisions

A major common feature of all three ETSs is that they consider the use of offsets and endorse their utility as a flexibility provision for obligated entities. While China is the most restrictive toward the use of offsets at the time of writing, its pilot ETSs still allow for the use of offsets, and China has historically benefited greatly from the CDM offset market under the first phase of the Kyoto Protocol. Korea has also ensured that offsets are included in its ETS and offered this flexibility to Korean firms. Japan is a global leader in offsetting through the JCM. Cooperation on offsets is one policy component with relatively low barriers for collaboration that China, Korea, and Japan could explore further.

Accounting Framework

Apart from offsets, there are very few policy similarities across the three carbon markets with the exception that China and Korea have both modeled their MRV frameworks on the EU ETS. While each country has a robust MRV system in place, the framework and rules for these systems are designed differently, as

the overall ETS design is different. Therefore, linkage considerations will depend on using techniques for heterogeneous policy connections.[17]

Carbon Price Levels

Moreover, Korea has the only carbon market with a regulated nationwide carbon price, although even Korea's carbon price is informed by the few carbon trades that have occurred during its first phase of operation. There was no carbon trading during the past year of the Tokyo and Saitama ETSs, and carbon trading has yet to begin in China's national ETS.

General Comparison

Korea has the most to offer in terms of experience sharing with carbon markets. Its ETS has been in force for far longer than China's national system, and the Tokyo and Saitama ETSs are not at a national level. Korea is now studying how to regulate firms under its third ETS phase, which will begin in 2021 and eventually start the process of auctioning allowance permits rather than free distribution. Korea is also the only country of the three with the intention to fully utilize the ETS as a policy tool to achieve its NDC under the Paris Agreement. Neither China nor Japan has signaled how its carbon markets will help them achieve their NDCs, and neither country has set out a vision for using carbon markets after 2020. Japan has clearly expressed its intention to use the JCM to meet its NDC, but the JCM is not a carbon market, as there is no emissions cap or trading of permits. Taking all of this into consideration, Korea could play a critical role in providing policy insight and advice to China and Japan on a wide degree of carbon market topics.

RECOMMENDATIONS FOR MOVING TOWARD LINKAGE

Despite the wide differences in carbon market design and evolution in Northeast Asia, ample opportunities still remain for cooperation on carbon markets in this subregion. With the right political environment and support in place, discussions and tangible progress on linking carbon markets between China, Korea, and Japan could take place. To lay the foundation for a tangible roadmap toward linkage, policy makers should consider the following:

1. **NDC Quantification Dialogue:** One of the most challenging aspects of the implementation of the Paris Agreement is the wide variety in how countries count their emissions reductions and track progress. Many countries with economy-wide NDCs have advocated for quantification of NDC targets as a precursor to participation in Article 6 transactions. NDC quantification would help ensure that double counting is avoided and would safeguard the environmental integrity of these reductions by having a robust inventory of emissions under the NDC in place.

   Recommendation: Hold an ongoing regional working dialogue on NDC quantification and measuring NDC progress. Regional governments could host such a dialogue in conjunction with experts and personnel from the regional United Nations Framework Convention on Climate Change (UNFCCC) office.

2. **Exploring Article 6 Interests and Alignment:** China, Korea, and Japan view the use of Article 6 to meet their current NDC in distinctive ways. China has not signaled any intention to use Article 6 at the time of this writing, whereas both Korea and Japan intend to use it to fulfill their NDC pledges. Japan intends to do so through the JCM, whereas Korea has not specified the type of Article 6–eligible units it will use to fulfill its NDC. While there are various initiatives to bring countries together to discuss and strategize how to finalize the Article 6 rulebook, no initiative currently exists for China, Korea, and Japan to discuss their views and challenges with implementing Article 6 within their respective NDCs. An Article 6 dialogue could achieve tangible results as it would allow not only for a difference of views to be exchanged but also a discussion on exploring pilot opportunities for the three (or two) countries to jointly pool resources in internationally transferrable mitigation outcomes (ITMOs) to mutually increase the ambition of their NDCs. By increasing exchanges on Article 6, indirect and informal opportunities for exploring carbon market linkage could also occur.

   Recommendation: Establish a government technical-level dialogue on the use of Article 6 within the context of each of the NDCs in China, Korea, and Japan. Such a dialogue could take place prior to the annual UNFCCC negotiations and rotate among the three countries.

3. **Tackling Industry Opposition:** Industry in Northeast Asia is largely opposed to regulations that impose a price on carbon, given the pressures of consistent economic growth and maintaining economic stability. Exploring areas for dialogue among industries on how carbon markets work in practice and how they have impacted economies in other jurisdictions (e.g., Europe, California, and New Zealand) could lead to an improved understanding of the merits of carbon pricing. An annual dialogue among representatives from similar industries across Northeast Asia, and in particular the power sector (including the power sector associations), could focus on the following topics:

   a. Internal company preparation and systems for ETS management
   b. Managing allowance allocation and ETS compliance strategies
   c. Building and sourcing an offset portfolio
   d. Best practices for third-party verification and audits
   e. Principles for linkage and global carbon pricing

   Recommendation: Facilitate an international industry exchange on overcoming obstacles to carbon markets in Northeast Asia. The goal of such a dialogue would be for industry to understand the benefits of regional ETS linkage and to support policy makers for a linked carbon market.

4. **Establish Official Cooperation:** Since 1999, the Tripartite Environment Ministers meeting among Japan, China, and Korea (TEMM) has taken place to explore and strengthen environmental cooperation in Northeast Asia.[18] While some discussion of carbon market cooperation has taken place through the TEMM, a formalized technical dialogue could be added to the agenda for policy makers from China, Korea, and Japan on offset usage, accounting frameworks, and market evolution, with the goal of identifying linkage opportunities.

Recommendation: Explore opportunities for officials from China, Korea, and Japan to meet annually to explore cooperation on carbon markets, with the TEMM as a key example.

5. **Simulation Learning:** A number of carbon market simulation tools available today are an excellent resource to learn in practical terms how carbon markets function. Organizations such as the Environmental Defense Fund and the Fundação Getulio Vargas business school have simulation tools available. These tools could be adapted and programmed to simulate a linked emissions market for Northeast Asia.

   Recommendation: Establish a linked carbon market simulation exercise for policy makers and industry participants to better understand how linked carbon markets could reduce competitiveness concerns and increase ambition.

CONCLUSION

During the past 10 years, substantial progress has been made in establishing carbon markets in Northeast Asia. Japan established subnational carbon markets in Tokyo and Saitama, China set up seven ETS pilots in several cities and provinces and a national ETS, and Korea established Asia's first economy-wide carbon market. Each of these carbon markets was set up to address national concerns over climate change and energy management and, as a result, were designed to function in a national economic context. Thus, carbon market policy design differs across Northeast Asia with a very wide gap in each implementation schedule. Korea sits geographically in the middle of this trio and is also the most advanced in terms of implementing its ETS. It has a clear mandate and intention to use its carbon market for the fulfillment of its NDC and is currently exploring ETS legislation for after 2020. It could offer vast insights to both China and Japan on carbon market implementation and policy design. In addition, many low-cost opportunities and easy-to-implement recommendations for information sharing and policy exchanges could help create the foundations for linkage of carbon markets in Northeast Asia.

ENDNOTES

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