Cross-border Market Linkages in Asia and the Pacific: Theoretical and Empirical Underpinnings

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Introduction

Benefits of Linkage

Lowering emission reduction costs

- Especially linking developed and developing countries' markets

Yielding financial and operational enhancements

- Enriching price discovery, liquidity provision, and risk management

Ameliorating the concern of carbon leakage

- Fostering the standardization of carbon market designs

Fortifying climate ambition

- Heightening mutual trust among nations and fostering domestic support for climate policies

International Agreements

The Kyoto Protocol (1997)

- Emissions Trading (ET), Clean Development Mechanism (CDM), Joint Implementation (JI)

The Paris Agreement (2015)

- Article 6.2: collaborating voluntarily through bilateral or multilateral agreements

  Internationally Transferred Mitigation Outcomes (ITMOs)

  - Countries transfer greenhouse gas (GHG) mitigation outcomes internationally
  - A recent comprehensive accounting framework for managing ITMOs cooperative mechanisms

- Article 6.4: promoting sustainable development while facilitating emissions reduction
- Article 6.8: including non-market mechanisms

Existing Practices of ETS Linkages

Europe

- The EU ETS linking with CDM and JI for compliance purposes
- The Swiss ETS + the EU ETS
- Discontinuation of international credits for compliance: New Zealand and the EU

North America

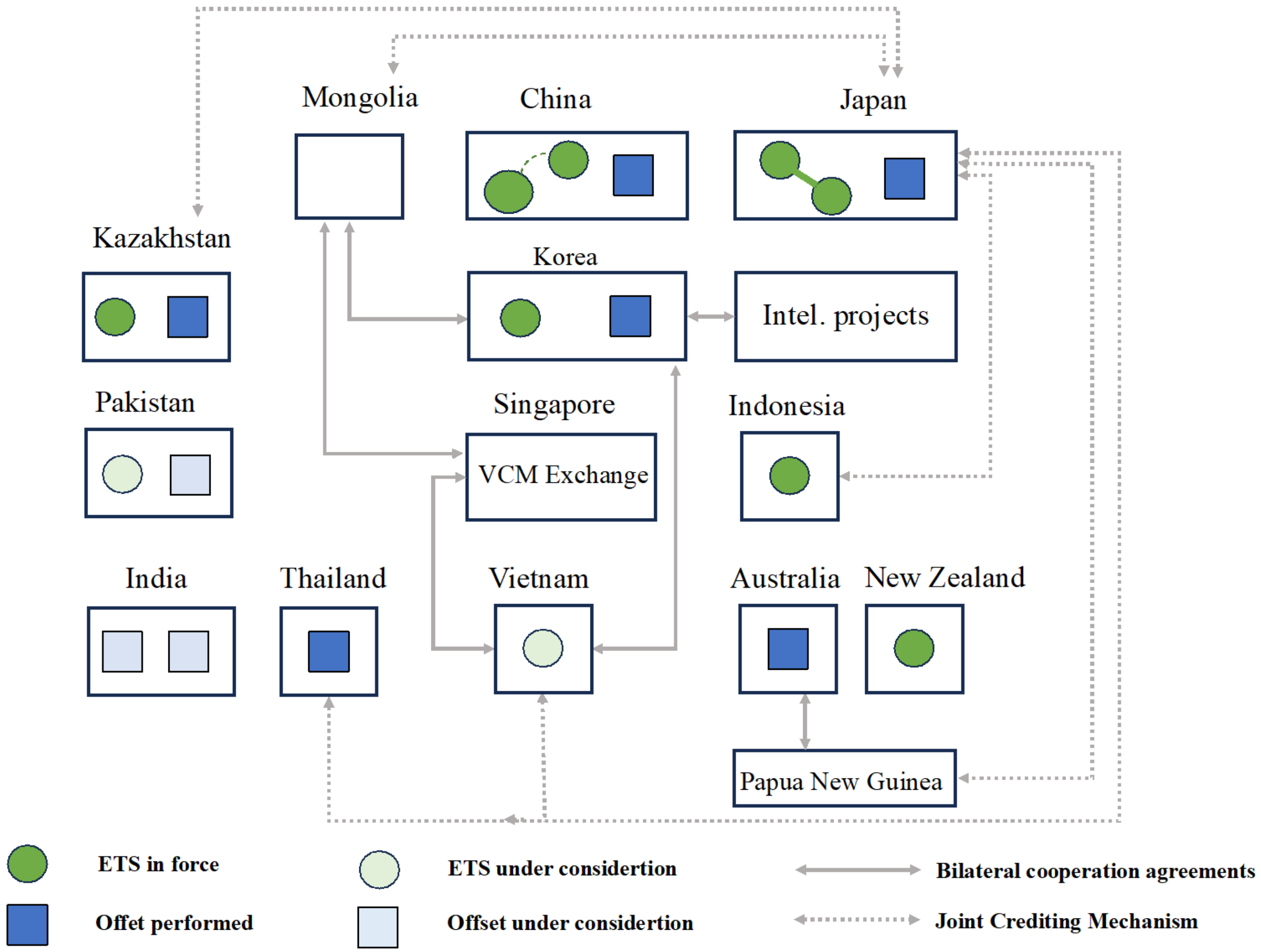
- The California ETS's linkage with the Quebec ETS

Voluntary programs

- Verified Carbon Standard (VCS)
- Gold Standard (GS)
- American Carbon Registry (ACR)

Carbon ETSs in Asia and the Pacific

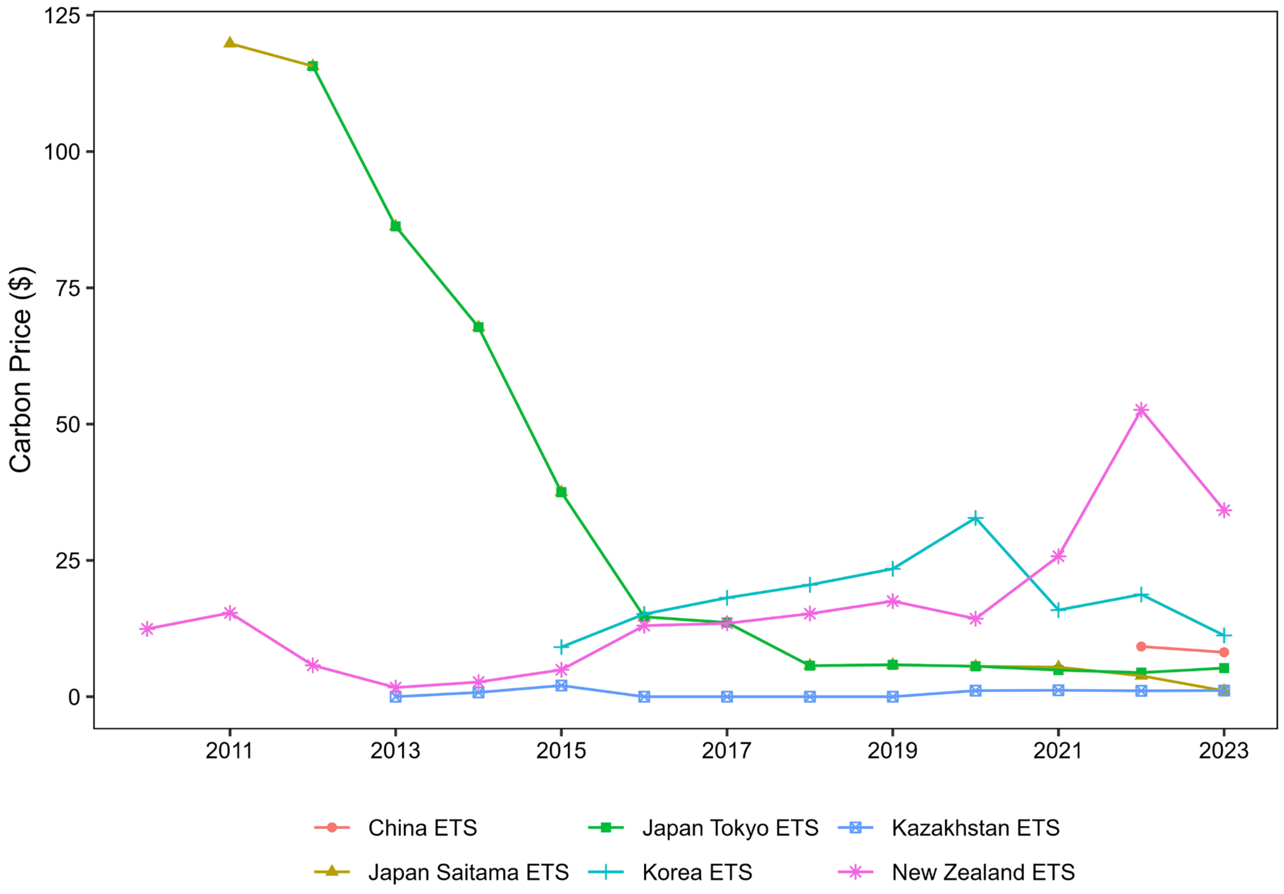
- **China:** 8 pilots (2013, Fujian, 2016), national ETS (2021)
- **Japan:** 2 sub-national ETSs in Tokyo (2010) and Saitama (2011), linked bilaterally
- **Korea:** K-ETS (2015)
- **Kazakhstan:** KAZ ETS (2013 – 2016; 2018 – now)
- **New Zealand:** forestry-based ETS (2008)



Economic Incentive to Link Asia-Pacific ETSs

- The Asia-Pacific region is the world's most substantial contributor to carbon emissions, responsible for **52%** of global emissions.
- Significant disparities in marginal abatement costs across countries.
- The relatively modest carbon prices prevailing in these regions do not pose a substantial risk of generating international imbalances.

Carbon Prices in the Asia-Pacific Carbon Markets



Research Goals

- To summarize the status of carbon market linkage in the Asia-Pacific region
- To explore the economic, climate, political, market foundations for ETS linkages
- To overview Asia-Pacific ETSs and explore potential linkage mechanisms
- To present prospective attempts for cross-border market linkages
- To identify challenges faced and offer corresponding policy recommendations

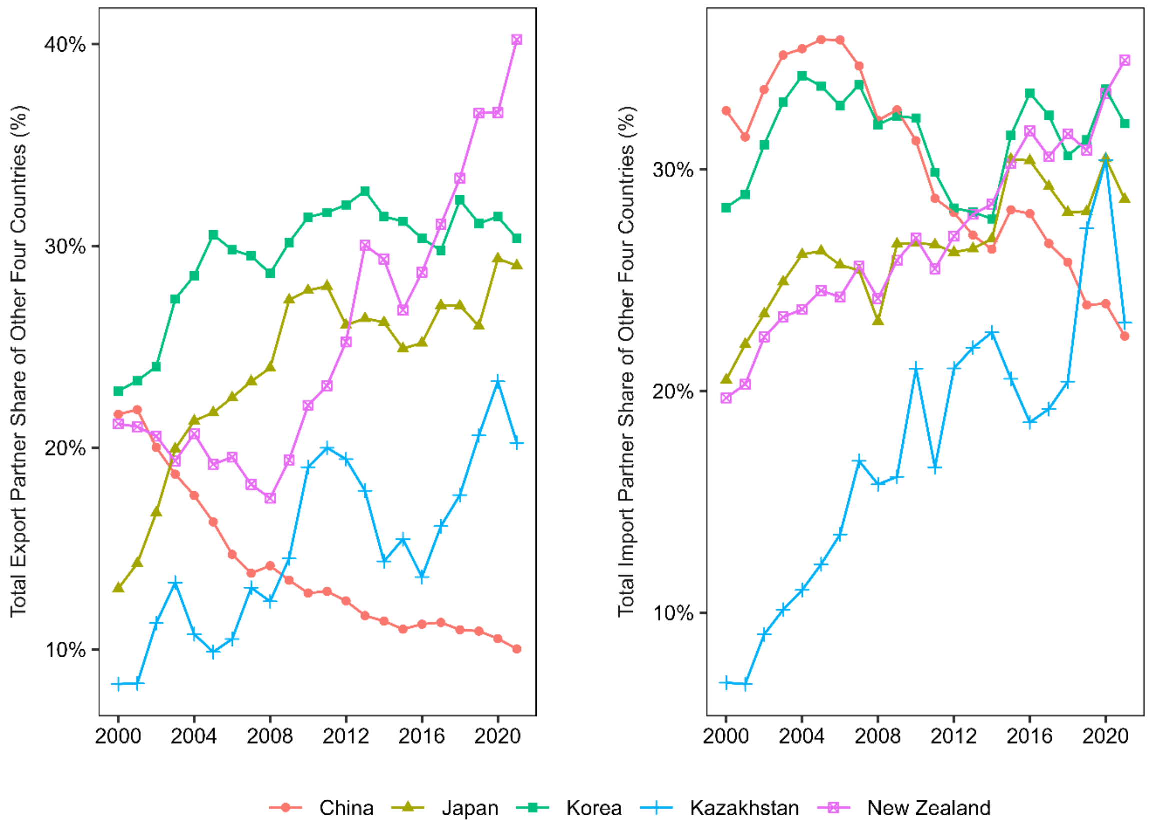
Foundations of ETS Linkage

Cultivation of Political Trust

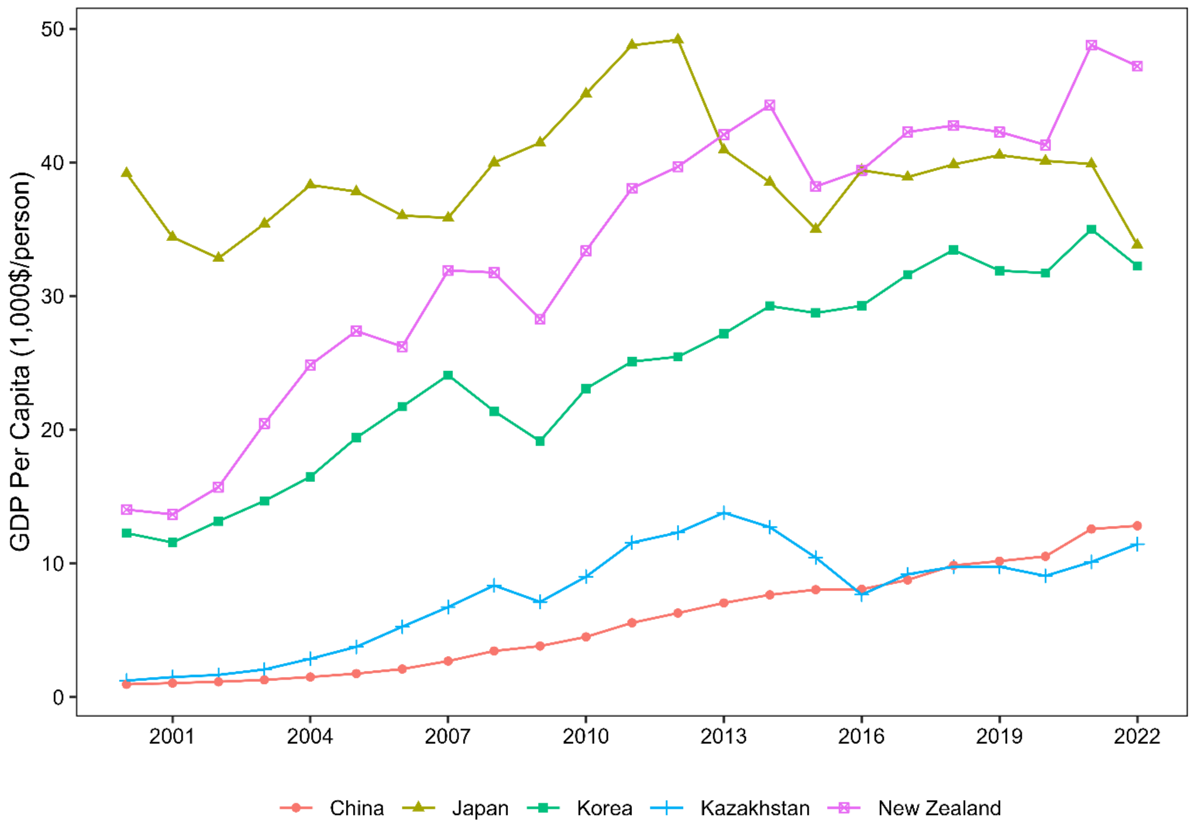
- Countries exhibit a greater propensity for collaboration when they possess pre-existing, trustworthy relationships, particularly those sharing similar policy objectives and climate frameworks.
- The Asia-Pacific countries have initiated interactions about climate change and environmental issues, laying a foundation for potential ETS linkages.
  - Bilateral and multilateral collaborations through dialogues, memorandum of understanding (MOUs), forums, and action plans.
- Among the five countries, China, Korea, and Japan are engaged in frequent interactions relevant to carbon markets.

Economic Interdependency

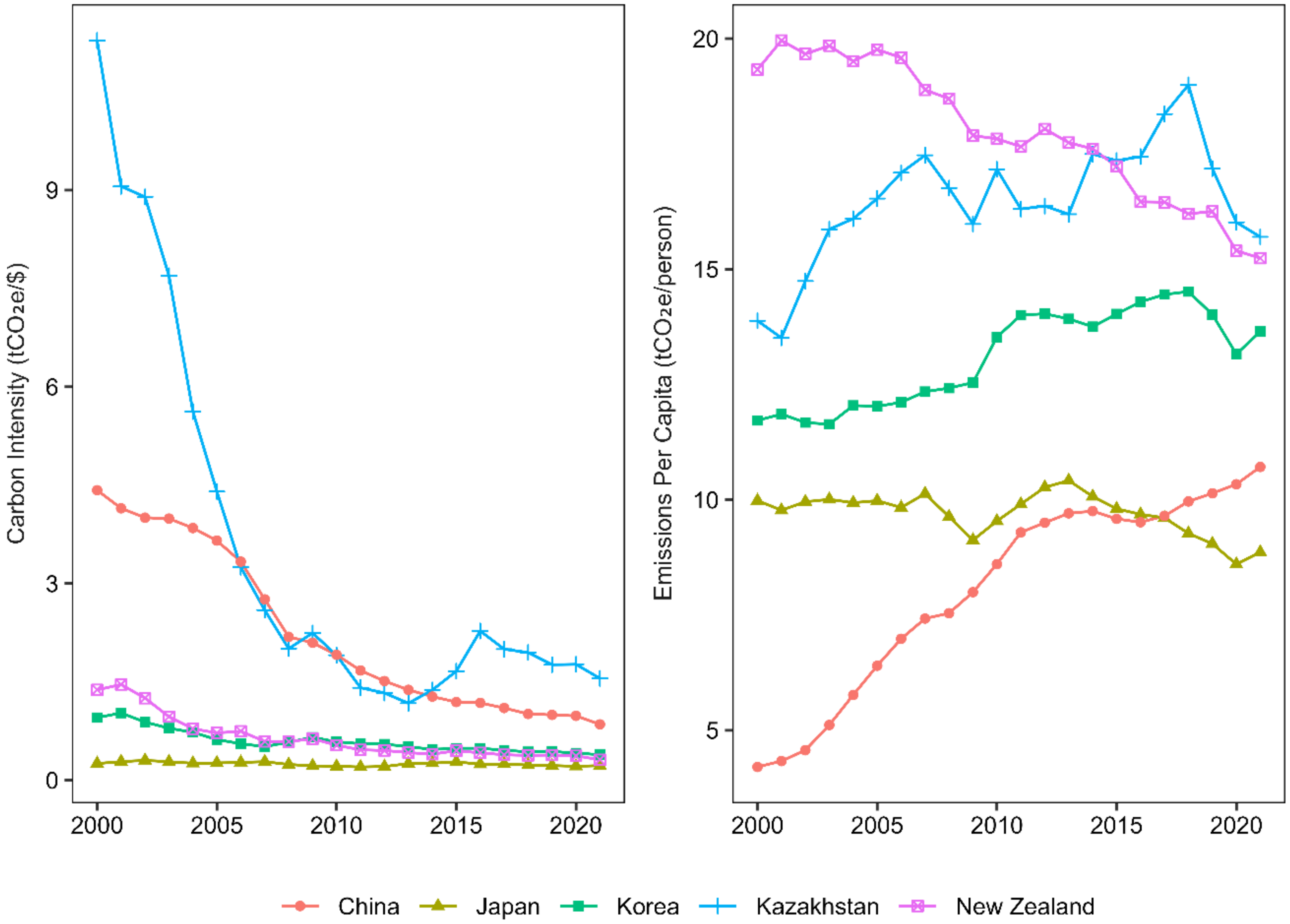
Bilateral Trades



Economic Growth



Pressure of Climate Change Mitigation Efforts



Alignment of Climate Goals

Country	Abatement Target in 2030			Carbon Neutrality Year
	Mass/ Intensity	Abatement	Base Year	
China	Intensity	60%-65%	2005	2060
Japan	Mass	46%	2013	2050
Korea	Mass	35%-40%	2018	2050
Kazakhstan	Mass	15%-25%	1990	2060
New Zealand	Mass	50%	2005	2050

Linking Asia-Pacific ETSs

Linking Mechanisms

Direct linkage: a system accepts allowances or credits from another one

- Joint cap-and-trade system: countries integrate their ETSs directly, allowing entities in one jurisdiction to use allowances from another
- Harmonization of regulations: a higher degree of harmonization in market rules, regulatory frameworks, and monitoring and verification systems

Indirect linkage: linking through the intermediation of a third system

- Indirectly linking compliance markets by participating in voluntary offset markets

Direct Linkage

One-way linkage (unilateral linkage)

- One system allows covered emitters to utilize allowances or credits from another system; however, the latter system does not reciprocate this mechanism.
- The linkage is asymmetrical and may have different regulatory frameworks or levels of development.

Two-way linkage (bilateral or multilateral linkage)

- Both participating systems mutually accept allowances or credits from each other.
- This involves harmonization of regulatory frameworks and policies to facilitate trading.

Linking Strategies

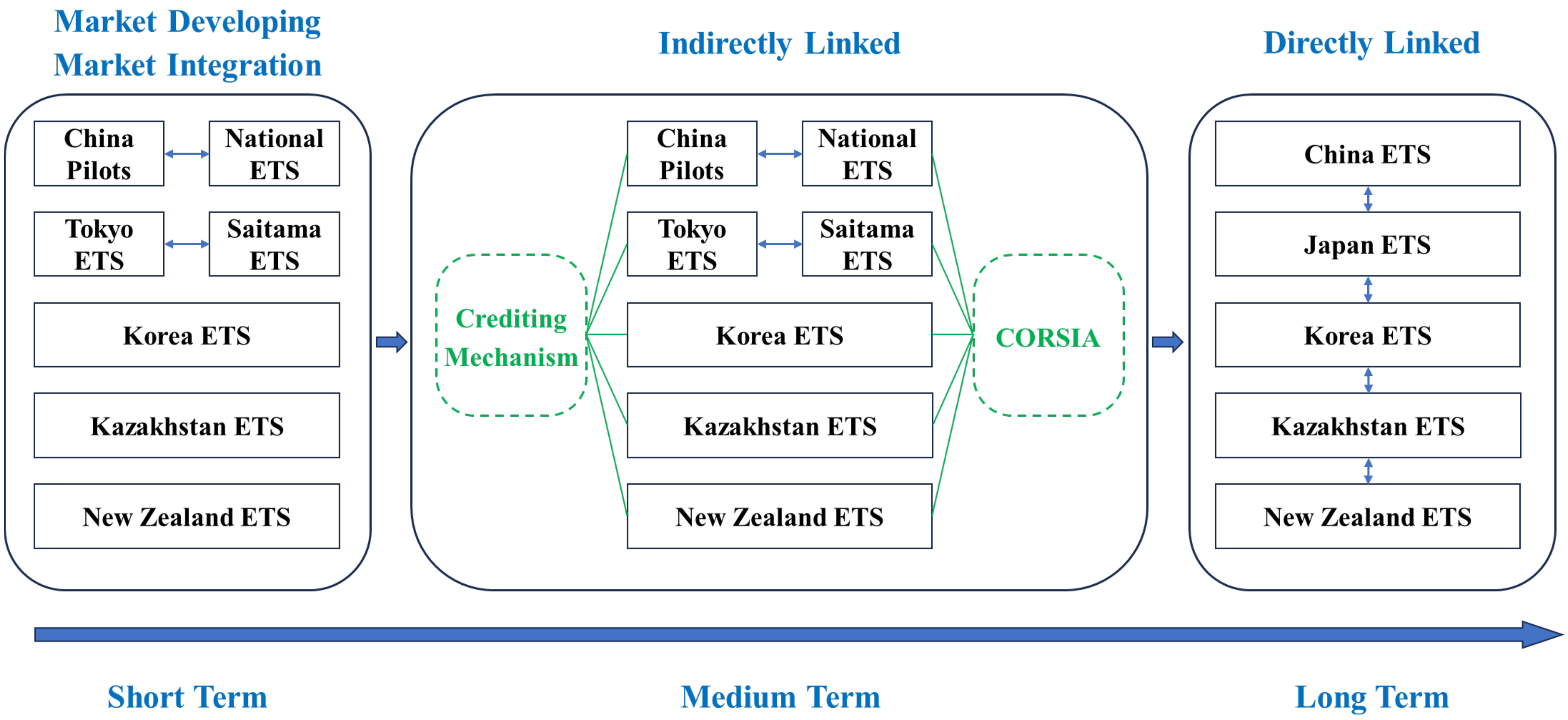
Advantages of bilateral or multilateral linkages

- Avoiding unilateral funds transfer
- Adapting to situations where marginal abatement costs change

Carbon market linkage in three stages

- Each compliance market should be further developed and prepared for linkage
- The compliance markets will be linked indirectly through the voluntary markets
- The compliance markets will be linked directly, with restrictions on the conditions under which allowances can be used for compliance

A Roadmap of Linking Asia-Pacific ETSs



Short Term

Addressing Domestic Market Fragmentation

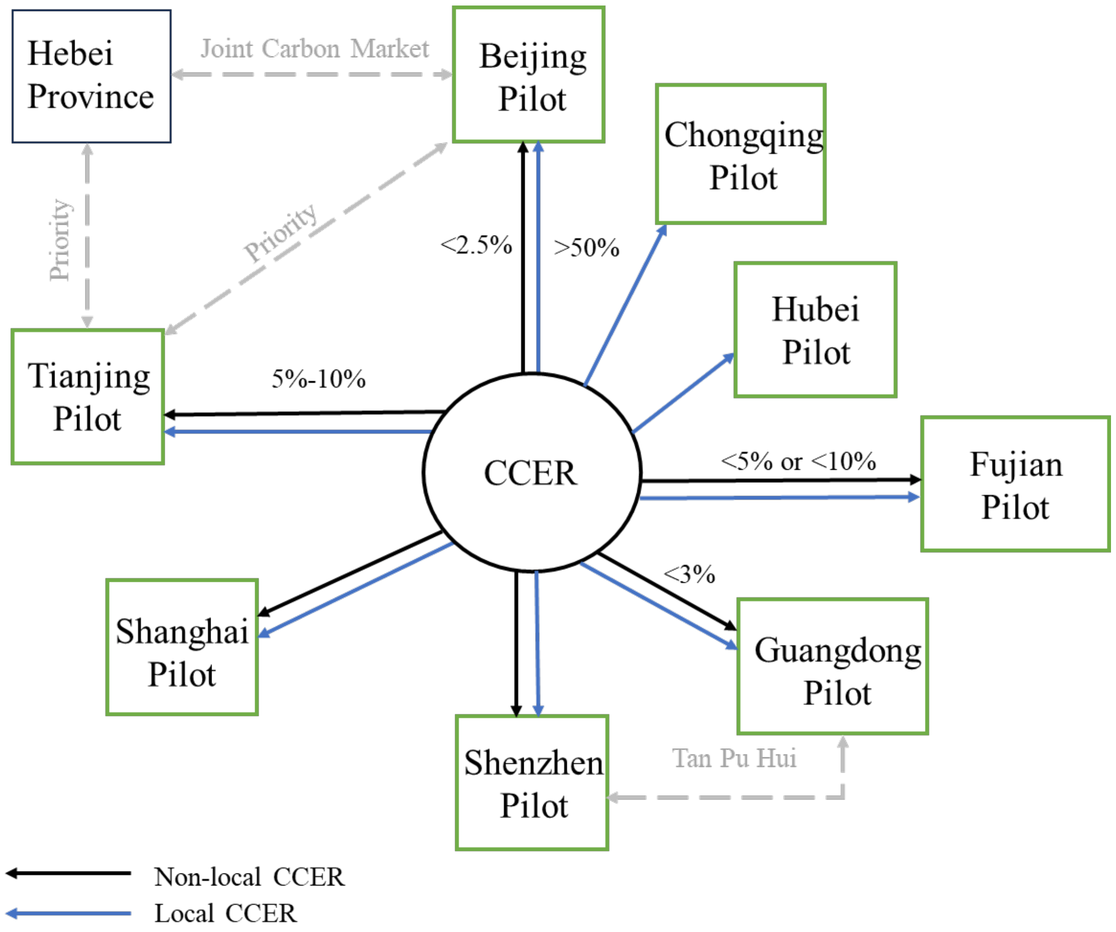
The case of China

- Co-existence of the national ETS and regional ETS pilots

Feasibility of utilizing offset mechanisms to link national and regional ETSs

- All voluntary markets recognize China Certified Emission Reduction (CCER), but the offset ratios differ
- Providing experience for exploring the linkage of Asia-Pacific carbon markets

CCERs in China's Regional Carbon Markets



Improving the Performance of Carbon ETSs

Gaps of market coverage

- Currently, only the Korea ETS and the Kazakhstan ETS set emission caps that exceed more than 50% of the country's total emissions.

Liquidity of carbon allowances

- China’s national ETS is a thin market with infrequent buying and selling activities

Involvement of non-compliance entities

- Financial institutions, carbon asset management companies

Carbon derivative markets

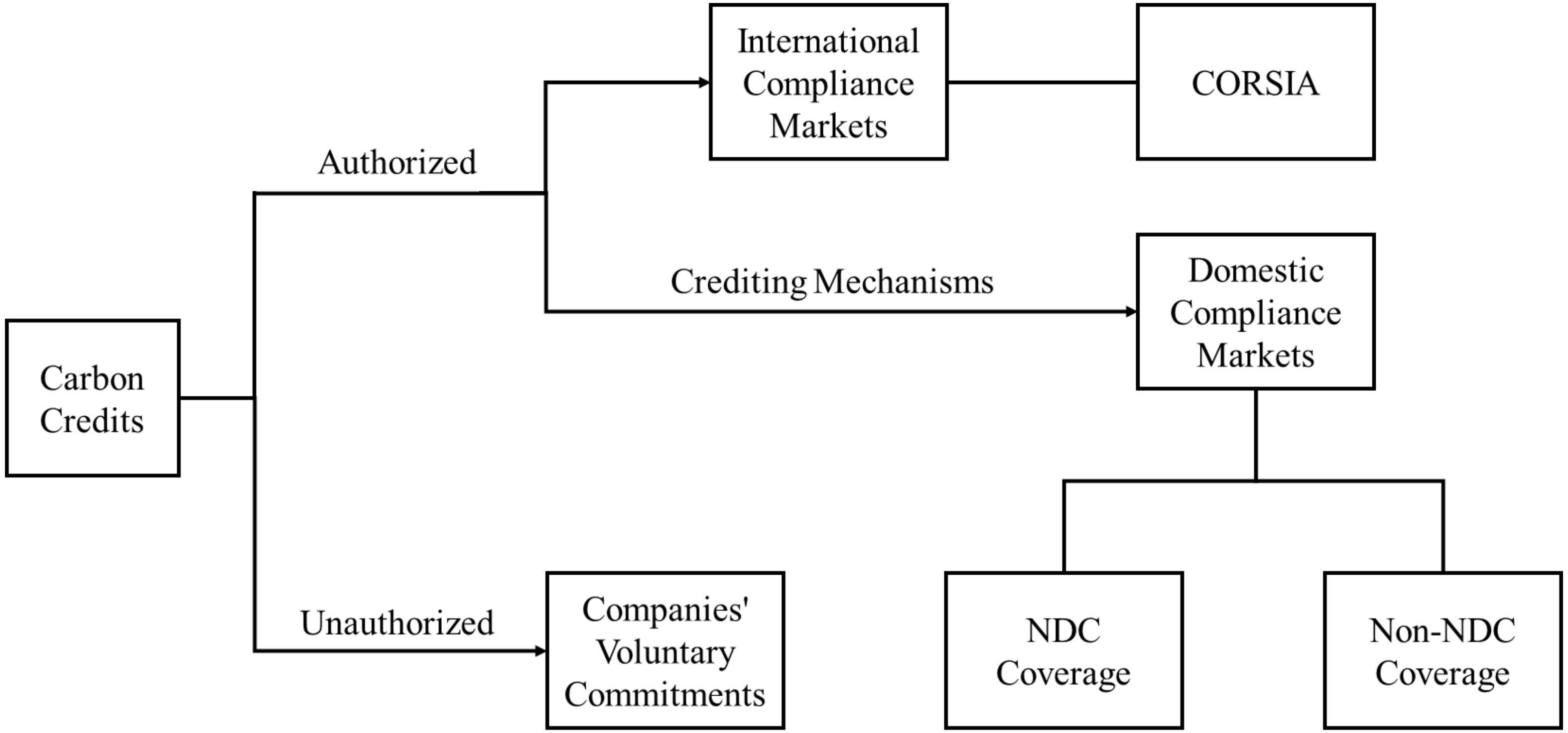
- Carbon futures, forwards, and options

Medium Term

Indirect Linkage through Voluntary Carbon Markets (VCMs)

VCMs demonstrate enhanced flexibility

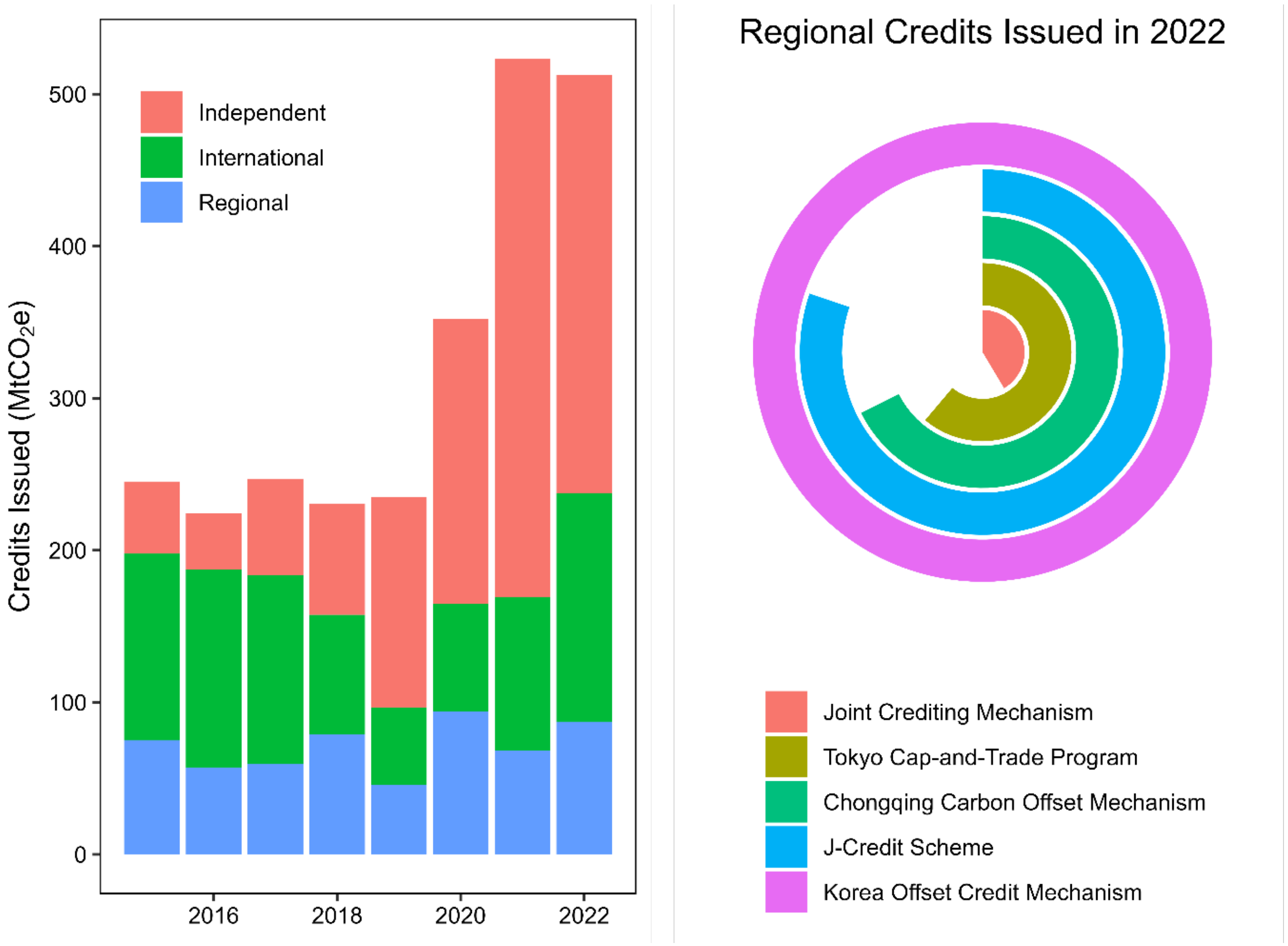
- Authorized or unauthorized carbon credits
- Independent, international and regional crediting mechanisms.
- Carbon credits can be traded through third-party platforms



Linking Using Offset Mechanism

- JI's discontinuation, discrepancy in CDM supply and demand, and quality issues makes **international** credit mechanisms no longer suitable
- **Independent** crediting mechanisms lacks standardized process to be recognized as convertible to NDCs
- **Regional** credit mechanisms would become the option for ETSs to be indirectly linked

Status of Crediting Issuance



Linking through CORSIA

- CORSIA, through implementing MRV mechanisms for aircraft operators, is determined to encompass all international flights and become obligatory for most nations.
- CORSIA purchases offsets from accredited programs and applies them to international flights. Thus, the projects conducted under CORSIA facilitate international carbon reduction with cross-border flights.
- This process serves as a valuable precedent, offering insights that can be extrapolated to other industries with transnational dimensions.
- However, criticisms exist regarding using CORSIA to link efforts in carbon emission reduction.

Long Term

Prospective Full Linkage

Full linkage after restricted linkage

- China, Japan, and Korea are suitable candidates for a full linkage due to their geographical, economic, and climate goal proximities.

Harmonizing cap types

- Asia-Pacific ETSs will eventually employ absolute caps

Allocation method considerations

- The combination of auction and free allocation (benchmarking rather than grandfathering)

Sector diversity as an advantage

- Non-overlapping sectors motivate linkage and reinforce the expansion of sector coverage

Encompassing Compliance and Voluntary Participants

Asia-Pacific ETSs encompass compliance and voluntary markets, except for New Zealand, which exclusively operates a compliance market.

- Regulations govern the utilization of offsets and credits with quantitative restrictions, which vary from country to country (China and Korea: 5%, Japan: up to 50%, Kazakhstan: No limit).
- Except for the Korea ETS, all other countries restrict the use of offsets to domestic credits for offsetting emissions.

Converging to Absolute Caps

Emissions coverage differs, with the

- Korea: 86% of its emissions
- Japan: 2%.

Cap setting

- Absolute emission caps: Korea, Kazakhstan, and New Zealand
- Intensity-based emission targets: China’s national ETS and Japan’s two sub-national ETSs

Extending ETS Coverage

- New Zealand ETS
  - Power, buildings, industry, transport, waste, and forestry.
- China's national ETS
  - Now only covers the thermal power sector
  - Sectoral expansion: petrochemicals, chemicals, building materials, iron and steel, non-ferrous metals, paper-making, and aviation.
- Types of greenhouse gases
  - CO_2: China, Japan, and Kazakhstan
  - Six Kyoto GHGs: Korea and New Zealand

Increasing the Share of Auctions

- Allowance allocation
  - Free allocation
  - Auction
- Free allocation: benchmarking and grandfathering. All the countries permit benchmarking: China's ETSs utilize output-based benchmarking, and the New Zealand ETS adopts an output- and intensity-based baseline. China, New Zealand, and Kazakhstan do not permit grandfathering.
- Entities receiving allowances for free through grandfathering may gain a competitive advantage through linkage with countries that do not permit grandfathering.
- China's national ETS and Japan's two ETSs do not allow auctions.

Governance of ETS Linkage

Comparable MRV Systems

Current

- New Zealand: self-reporting with a selected sample for compliance assessment
- Japan: covered emitters are obligated to report their emission reduction plans
- Korea: revisions are mandated to ensure precise emission estimation in cases of inaccuracy
- China and Kazakhstan: non-compliance entities are also obliged to report their annual emissions

Future

- Internationally recognized standards, such as those from ISO and IPCC, can guide MRV processes for linked ETSs.

Coordinating Market Stabilization Mechanisms

Price-based Mechanisms

- China: max daily allowance price fluctuations
- Korea: temporary price limits under specific conditions
- New Zealand: reserve price for allowances auctions

Supply-based Mechanisms

- Banking is permitted in all ETSs but is subject to different constraints
- Borrowing is allowed in both China’s and Korea ETSs
- Market stabilization reserves in Japan, Korea, and New Zealand

Strengthening Enforcement

Financial penalties for non-compliance must be robust, exceeding the cost of non-compliance

- All five ETSs incorporate financial penalties to address non-compliance and behaviors that could impact the fairness of the carbon market.
  - Flat-rate penalty: China, Japan, and New Zealand
  - Allowance-based penalty: Korea and Kazakhstan
- ETSs in Korea and New Zealand introduce a penalty equivalent to three times the market price of the allowance as an additional measure.
- China's national ETS incorporates additional penalties, such as reductions in the allowances allocated for the following year, to incentivize compliance.

Challenges and Recommendations

Challenges

- Methodological dispute exists over adjustments for direct and indirect emissions
- Addressing domestic economic consequences, such as capital outflows, exchange rate depreciation, and welfare deterioration
- Variations in legal frameworks and the extent of climate policy legislation can impede the process
- The issue of sovereignty loss becomes particularly pronounced in multilateral linkages
- Linkage may facilitate the creation of climate clubs

Recommendations

Before linking

- Initially, focus on improving domestic carbon markets
- Revise international offsetting policies to accelerate VCM. Pilot markets may serve as a testing bed
- Regularly update NDCs and establish a national registration system for ITMOs

After linking

- Multi-party communication platform; Legal MRV framework for compliance tracking
- Authorized cooperative organization for trading infrastructure
- International carbon allowance calculator
- Strengthen financial regulations on fraud, misleading information, manipulation, and transfer pricing
- Cooperative policies to ensure the environmental integrity