Dialogue Facility on ETS Development in Asia

ETS Cap-Setting and Allocation

Meeting report

Overview

The Asia Society Policy Institute is convening a series of private dialogue meetings that bring together experts in emissions trading system (ETS) development from selected Asian jurisdictions. This initiative is to support the successful implementation of national ETSs in Asia, by sharing detailed experiences, exploring challenges and identifying practical solutions, based on Asian and international best practice.

Cap-setting and allocation are fundamental elements of an ETS design, determining its environmental and economic impacts. Different approaches are being adopted across major Asian economies, including absolute and intensity-based caps, allocation-based and credit-based systems, and voluntary and mandatory approaches. However, all face the common challenge of enabling Nationally Determined Contribution (NDC) targets under the Paris Agreement to be met in a cost-effective way, facilitating decarbonization of power and industrial sectors, mitigating risks of carbon leakage and reducing cost impacts to exporters of carbon border adjustment mechanisms (CBAMs).

There is now significant experience to learn from. In Asia, the Korean ETS (K-ETS) has over nine years of operational experience, and China's National ETS, the world's largest by emissions coverage, builds on over ten years of experience of sub-national pilots. Internationally, the EU ETS is the key reference, with nearly 20 years of experience.

This meeting, held on 3rd July 2024 by videoconference, explored critical issues related to cap-setting and allocation.

The meeting included a presentation session on K-ETS cap-setting and allocation practices, issues and solutions, followed by a discussion session on solutions to issues related to cap-setting and allocation in the implementation of ETSs in Asia. Scene-setting presentations were provided by key experts on the systems in China, Vietnam, Indonesia and Japan. Participants included policymakers and experts from China, Korea, Japan, Indonesia, Vietnam, India and the EU, with 80 participants in total.

Summary

A summary of key points from the discussion is presented below.

1. *What are the key factors to consider for cap-setting?*

For the EU ETS, the starting point for cap-setting is the EU's overall climate target. The EU has an economy-wide goal of achieving climate neutrality by 2050, with an intermediate target of a 55% reduction in GHG emissions by 2030 compared with 1990 levels. This target applies to the entire economy, so it needs to be translated into a specific sub-target for the ETS, considering other climate and energy policies.

The EU ETS cap represents a 62% reduction in GHG emissions by 2030 compared to 2005 levels. To determine this target, several key factors must be considered, including the selection of an appropriate pathway, the pace of reductions, the overall cumulative carbon budget for the period, and cost-effectiveness, which is the overriding consideration.

Extensive analysis and modelling is conducted to determine the EU emission reduction target and EU ETS cap, aiming to ensure that the transition to net zero is as cost-effective as possible for the economy. A comprehensive and integrated suite of economic, energy and emissions modelling systems is used including an EU energy system model, which is a partial equilibrium model simulating the energy market and incorporating EU carbon pricing trajectories and microeconomic theory. It provides a detailed representation of energy demand, supply, and emission abatement technologies. The modeling doesn't only look at climate policies but also at complementary policies, as it is necessary to design a comprehensive package and take into account the impacts of other policies on GHG emissions.

Another important factor is the allocation of allowances within the cap. While systems in Asia predominantly rely on free allocation, the default method in the EU is auctioning allowances. Currently, 57% of the cap is allocated through auctioning, as established in the legislation. Auctioning is the most transparent method of allocation, putting into practice the principle that the polluter should pay and creating a stronger carbon price signal to drive emissions reductions. It also reduces the risk that some entities may gain an unfair ('windfall') profit from an ETS in which they can charge a higher price for their product without paying for their allowances. Furthermore, auctioning facilitates the generation of revenue which can be used for climate action[1].

Extensive public consultation is conducted when deciding on the target, considering contributions from all stakeholders, including Member States, affected companies, industry associations, etc. The process is highly transparent. Once the Commission proposal is prepared, the co-decision process involves EU legislators - the Council, the Member States, and the Parliament - who discuss and agree on the target together. This transparent and inclusive process is crucial for setting the cap, given the complexity of the EU jurisdiction.

Similar to the EU, South Korea undertook complex economic and energy system modelling for determining its NDC and sectoral emission targets, from which the K-ETS cap is determined, and also engaged in extensive discussions with stakeholders to evaluate the abatement potential and associated costs. According to government law, the K-ETS cap must align with the NDC, meaning that the emission budget for sectors under the NDC must be translated into contributions to the cap for the corresponding sectors and sub-sectors[2].

2. *Is an absolute cap or an intensity-based (rate-based) cap more appropriate for cap-setting for an economy in transition?*

It is observed that some key Asian economies are adopting intensity-based caps because of concerns that an absolute cap may restrict economic growth. However, this should not be an

[1] The EU has generated the most significant amount of ETS revenue so far from auctioning (over USD 200 billion) due to relatively high carbon prices and full auctioning for its power sector. Revenue is partly distributed among Member States for climate and energy purposes, and related social purposes, and partly used to finance centralized funds including the Innovation Fund (for demonstration of innovative low-carbon technologies in ETS sectors), Modernisation Fund (for modernization of energy systems in lower-income Member States) and Social Climate Fund (support for vulnerable households, transport users and micro-enterprises).

[2] The K-ETS cap is the sum of sectoral contributions to the cap, which equal the sectoral GHG emission targets multiplied by the shares of sectoral emissions from K-ETS entities out of total sectoral emissions.

issue. From the outset, the cap under an ETS does not need to be reduced, instead it can increase in the initial phase before emissions peak. The K-ETS cap did not decrease in the initial years and emissions continued to rise. Furthermore, the cap should be designed to include space to allow for allocations to new facilities and expansions in production of existing entities.

Even though Korea initially had an intensity-based NDC target, Korea adopted an absolute cap for the K-ETS since its start in 2015 to minimize uncertainties around allowance allocation in order to reduce price volatility and encourage investment, as well as to provide greater certainty in the control of emissions.

With absolute caps, however, it is important to include appropriate policy tools to respond to potential economic shocks, as these systems have less inherent flexibility than intensity-based systems. Regarding possible serious unexpected surpluses or shortages of allowances, oversupply can be addressed by market stability operations, allowance banking and long-term predictability in system design; whilst shortages can be addressed by auctioning allowances with a price floor, sales of allowances at fixed prices and reserves for new entrants.

Overall, it is good practice to have a long-term plan for the development of an ETS recognizing that not all the elements of an effective design may be in place in the first phase and may take some time to develop. Such a plan would provide considerable benefits, including providing greater long-term certainty and predictability to obligated entities to help them make effective investment decisions for reducing GHG emissions.

3. *In the case of Indonesia, without a liberalized electricity market, where carbon costs cannot yet be transferred to electricity consumers and cannot be borne by government, how should target setting be done for power plants?*

In Korea, power generating companies are charged with the cost of allowances, but this cost was not transferred to consumers at the start of the K-ETS. That is why the K-ETS included allocation for indirect emissions from electricity consumption, to try to limit power consumption.

However, starting in 2022, some of the power generating companies' carbon costs were shared with consumers. This change was due to the transition from a traditional economic merit order to an environmental merit order for power station dispatch[3], as well as a mechanism to pass-through carbon costs to retail electricity prices, although with limitations on the extent. Consequently, power generators share these costs with Korean consumers to a certain extent.

Some lessons can be taken from the Korean case. Firstly, while it may not be possible to pass the entire carbon cost to all electricity customers, it is necessary to pass some of the costs to certain consumers and to reflect carbon costs in power station dispatch decisions. This approach will help achieve the NDC by reducing GHG emissions at both the points of power consumption and generation. Secondly, during ETS implementation, it might be challenging, but it will be important to introduce auctioning of allowances and increase the percentage of allowances allocated by auctioning, at least for the power sector. Some auction revenue can be used to offset any deficits for the utility companies, in addition to the use of revenue to support investments of ETS entities in decarbonization technologies and for other beneficial purposes.

In Indonesia, there is a mechanism to adjust the electricity price for consumers. However, this adjustment currently only happens due to changes in exchange rates or fuel prices. Logically, consumers should feel the carbon price, but the way the regulation is now done does not cover that yet. This could be changed in the future. As part of the policy discussion with the

[3] Reflecting carbon costs in the variable operating costs of power stations that are used to determine the priority order of dispatch, in addition to fuel costs, etc.

government, it might be a good option to pass some costs to certain power consumers, for example, those with the highest energy consumption, while not burdening poorer individuals. This issue has to be treated very carefully, as energy prices are sometimes used as political tools.

4. *Under Japan's GX ETS, what are the realistic options for setting emission reduction targets in line with achievement of Japan's NDC of 46% reduction by 2030, when such reductions may not be feasible for hard-to-abate sectors?*

In Japan, discussions are under way on the introduction of a mandatory system starting in 2026, and determining how to set targets for each company is a very important and challenging question that is under discussion.

Benchmarking is one of the options being considered. Japan already has benchmarking programs under the Energy Efficiency Law and might be able to refer to these existing programs as a model. Additionally, Japan is learning from ETS systems around the world and considering the balance between the stringency of the targets and their impact on the economy.

For some sectors, it will be harder to abate than for others. Implementing an equal percentage reduction target across all sectors may result in unequal treatment. This approach could lead to high costs for some sectors and may not reward early action.

The different potentials for emissions reduction across sectors covered by an ETS can be reflected by developing sectoral GHG emission targets and ensuring that final allocations are adjusted to align with these through use of adjustment factors, as in the case of the K-ETS. Different sectors can have different targets, within a differentiated approach for setting the cap across sectors. The steel industry and other hard-to-abate industries may have a lower burden of reducing emissions in the early phase of an ETS. This can be reflected not only in cap-setting, but also in allocation, though the design of benchmarks.

Under this approach, lower reduction burdens in some sectors would need to be balanced by higher burdens in other sectors such as buildings and transportation to achieve a country's NDC. The ETS cap should represent a cost-effective and optimised sharing of the GHG emission reduction burden across the economy as a whole, considering both ETS and non-ETS sectors.

A notable development in the EU ETS is that part of the allocation is now conditional on providing a climate neutrality plan at the installation level, which must aim for climate neutrality by 2050 and include interim targets in five-year steps. It should outline the measures needed to achieve these targets, allowing for a non-linear progression, with slower initial progress and faster advancement later on.

Finally, an important aspect of Japan's system that will facilitate industrial decarbonization is the introduction of the Climate Transition Bond[4], which provides substantial funding for sectors to invest in emission reduction technology, especially in hard-to-abate sectors. This bond will be paid for by revenue from ETS auctioning for the power sector by 2033, although it was commented that auctioning should be adopted as early as possible for fast energy transition.

[4] Japan's Climate Transition Bond is issued from 2024 and over the next decade, and provides 20 trillion yen (approximately USD 120 billion) to facilitate upfront investments in green transition of Japan's power and industrial sectors. The overall aim to realize more than 150 trillion yen (approximately USD 900 billion) of public and private sector investment in low-carbon technologies. Proceeds from the auctioning of emissions allowances for power generators, as well as a levy on fossil fuel imports, with pay for the bonds.

5. *Under what conditions and circumstances is a benchmark or grandfathering approach more appropriate for the free allocation of allowances?*

The allocation method establishes the approach for distributing allowances under the cap, has direct financial implications for covered entities and, in the case of free allocation, enables governments to mitigate risks of carbon leakage of energy intensive and trade exposed sectors. For free allocation, both grandfathering and benchmarking approaches are applied in Asia. There is a trend towards benchmarking[5] as this approach rewards entities with low emissions intensity, and can reduce competitiveness distortions within a sector. In contrast, the grandfathering method, whilst potentially easier to implement, allocates allowances in line with historic emissions so does not reward best performers.

It is important to recognize that a system does not need to be perfect from the start, and that starting with grandfathering is a valid approach. Benchmarking could be implemented initially for some sectors, while developing benchmarks for the remaining sectors over time.

Benchmark levels in Asian ETSs are expected to become more ambitious, as exemplified by planned developments of the K-ETS, driven by the need to achieve greater emissions reductions, reduce oversupply of free allowances and reduce exposure to costs under the EU's CBAM. For example, these can be based on the emissions intensity performance of the top 10% of facilities or be set 10% below the average emissions intensity, reflecting learning from experience in the EU and California.

A feature of the current ETSs in Asia is the use of free allocation for the power sector, where benchmarks (or targets) can be differentiated by fuel type, technology, and size. This approach can reduce system efficiency and does not incentivize fuel switching to lower carbon fuels and renewable energy. Best practice is to have one benchmark per product, with no differentiation, for example as achieved by recent changes to power sector benchmarking under the K-ETS.

A key lesson from the experience of the EU ETS is the importance of specifying key allocation design decisions in legislation to avoid lengthy and time-consuming debates with stakeholders that can delay the introduction of an effective design, as experienced in Korea, and lead to greater uncertainty in the long-term evolution of the system.

Practical lessons for developing benchmarks include the need to introduce legally binding data submission requirements, have clear data collection guidelines to ensure data comparability and ensure close involvement with stakeholders during the process.

6. *What are the main uncertainties and levels of risks the authorities should be aware of and accept when deciding on cap-setting and allocation in the early stage of an ETS?*

For the EU ETS, in the early stages, there was a risk of underreporting emissions. If an installation reports fewer tonnes of GHG emissions than it actually emits, and there is no proper verification, this can seriously affect the effectiveness and credibility of the system. A crucial foundation for an ETS is a very solid monitoring, reporting, and verification (MRV) system. Without such a system, there is a high degree of uncertainty about how much emission reduction is achieved in reality, a lack integrity of the ETS, and a loss of confidence in the carbon market.

In more recent years, there has been the risk and experience of oversupply or surplus of allowances. This issue became apparent in the EU ETS around 2010 due to the economic crisis, which caused emissions to be reduced much more than anticipated. Additionally, the import of international offset credits into the EU ETS contributed to this surplus, leading to lower

[5] Using output-based GHG emissions intensity benchmarks.

carbon prices and a weaker incentive to reduce emissions. In the short term, a large surplus risked undermining the orderly functioning of the carbon market, and in the long term, it can affect the ETS's ability to meet its ambitious reduction targets in a cost-effective way due to an imbalance between supply and demand that weakens the price signal.

To address this issue, the EU implemented several measures. Initially, ‘backloading’ was used to delay the auctioning of allowances without changing the cap itself. More recently, the Market Stability Reserve (MSR) was introduced in 2019, a rule-based tool that adjusts auctioning volumes based on surplus or scarcity of allowances in circulation. Additionally, in the latest ETS revision, there has been a double rebasing of the cap to bring it more in line with actual emissions.

Looking to the future, a critical uncertainty for the EU ETS concerns residual emissions from hard-to-abate sectors, particularly as the EU aims for net-zero emissions by 2050. Currently, policy options are being explored for carbon removals, but it is still unclear whether these will be integrated into the ETS or if a separate system will be designed. Many questions need to be clarified in the coming years.

In Korea, there has also been a lot of trial and error. The EU ETS has been a key reference, but given the different economic context and size, there are many limitations in merely referencing the EU ETS. A key focus has been on establishing a strong MRV system, as data quality is a key priority. It was made clear that third-party verification was required, and a system was established for a multi-tiered verification process. Before the adoption of the K-ETS, Korea implemented the Target Management System which required monitoring and reporting of GHG emissions, providing valuable data to help develop the K-ETS cap and allocation amounts.

These uncertainties and challenges underscore the need for continual adaptation of ETS policies and frameworks in the years to come.

Annex 1: Agenda

Opening session		
5 mins	**Welcome remarks and introduction**	Alistair Ritchie Director, Asia Society Policy Institute
Presentation session		
10 mins	**K-ETS cap-setting practices, issues and solutions**, including alignment of cap with Korea's NDC	Dr. Hyung-Wook Choi Director, GHG Inventory Management Team, Greenhouse Gas Inventory and Research Center of Korea
20 mins	**K-ETS allocation practices, issues and solutions**, including development and implementation of benchmarks and allocations, and approach for Phase 4	Dong-Hyeok Kwon Managing Director, BNZ Partners, Korea
Discussion session		
30 mins	**Issues and questions related to cap-setting and allocation in the implementation of ETSs in:**	
	China	Professor Zhang Xiliang Tsinghua University, China
	Vietnam	Dang Hong Hanh Managing Director, VNEEC, Vietnam
	Indonesia	Paul Butarbutar Director, JJB Sustainergy, Indonesia
	Japan	Professor Toshi Arimura Waseda University, Japan
10 mins	Break	
80 mins	**Discussion of solutions to each of the issues**	Moderated discussion including EU and Asian ETS experts, and all participants
5 mins	**Issues in other Asian jurisdictions**	All participants
15 mins	**Further discussion and Q&A**	Moderated discussion
Closing session		
5 mins	**Summary of issues and solutions** **Concluding remarks**	Alistair Ritchie Asia Society Policy Institute